

~~A.C.~~
~~6-1-66~~

10, 1966

IN THE PRIVY COUNCIL

No. 7 of 1964

ON APPEAL

FROM THE SUPREME COURT OF NEW SOUTH WALES

IN COMMERCIAL CAUSES

No.3000 of 1955 & No.3001 of 1955

B E T W E E N

OVERSEAS TANKSHIP (U.K.) LIMITED
(Defendant)

Appellant

- and -

THE MILLER STEAMSHIP COMPANY PTY.
LIMITED and another (Plaintiffs)

Respondents

And by Consolidation Order of the Supreme Court
of New South Wales 28th October 1963

B E T W E E N

THE MILLER STEAMSHIP CO. PTY. LIMITED and
another (Plaintiffs)

Appellants

- and -

OVERSEAS TANKSHIP (U.K.) LIMITED
(Defendant)

Respondent

RECORD OF PROCEEDINGS

VOLUME 2

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DP/CJ6
IN COMMERCIAL CAUSES. Nos.3000 & 3001 of 1955

Plaintiffs
Evidence

CORAM: WALSH J.

14th February
 1963

THE MILLER STEAMSHIP CO. PTY. LIMITED v. VACUUM
OIL CO. PTY. LTD. CALTEX OIL (AUST.) PTY. LIMITED
and OVERSEAS TANKSHIPS (U.K.) LIMITED.

R. W. MILLER & CO. PTY. LIMITED v. SAME.

SEVENTH DAY - THURSDAY, 14TH FEBRUARY, 1963.

10 MR. ASH: Arising out of my tender of certain news-
 paper articles yesterday - it may be covered by the
 same ruling - I purported to tender a "Times"
 article covering the "Panamanian" fire. At the
 moment, although it appears from an article in the
 Public Library, an article appeared in the "Times"
 in 1945 I have not, in Sydney, immediately avail-
 able, the precise copy. However, I could get it
 perhaps before the case concludes. I have not
 seen the article but it is an article listed in the
 20 index of the Public Library, giving some informa-
 tion about the "Panamanian" fire. I cannot tender
 the article now but it is put forward on precisely
 the same basis, except that it is published nearer
 the centre of the world than the two Australian
 copies.

HIS HONOUR: The Defendant is an English company.
 There is a letter already in evidence written from
 London, purporting to be signed by the general
 manager. (To Mr. Meares): That may be somewhat
 different to the Australian paper.

30 MR. MEARES: Yes.

HIS HONOUR: I would be happier about admitting it
 if I had some evidence - which I have not at pre-
 sent - to show that this company was in existence
 at the earlier date.

MR. MEARES: I can make inquiries about that. I
 will not take any point on that unless I am advis-
 ed that that was not the fact.

MR. ASH: Will Your Honour reserve liberty to me?

Plaintiffs
Evidence

14th February
1963
continued

HIS HONOUR: Yes.

MR. ASH: I opened a fact, the time the "Wagon Mound" left the Harbour. I opened that it left shortly after eleven on the same day.

MR. MEARES: Does that appear from the log?

MR. ASH: I think so. It was 11.9 a.m. on Tuesday, 30th October 1951.

Finally, I understand my friend is prepared to make an admission on the quantum, at this stage of the case. He is prepared to admit that, in quantum, the damage caused to the "Corrimal" was in excess of £1,500, and therefore, I suppose, as it is a consolidated action, the total damage to both ships was in excess of £1,500. I understand my friend is prepared to make both admissions.

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HIS HONOUR: The second admission is that the damage to both ships exceeded £1,500.

MR. ASH: Yes. I only get that for greater caution, because they are consolidated actions.

20

HIS HONOUR: It seems to be an unnecessary admission, but I will just note that it is made, without making any comment on its legal importance.

MR. ASH: On that point, my friend and I have discussed it, as I indicated at the outset, and, in short, for a number of reasons my friend has agreed to postpone the assessment of damage. An agreement having been reached, the precise implementation can be covered, we presume, by a number of courses Your Honour can take - adjourning the case, giving an interim judgment on one matter. It is proposed to conclude hearing the evidence on the issue of liability, as I understand it, and not to proceed with damages at this stage.

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HIS HONOUR: I may as well mention it now. If the parties want it, I think that is a good course to take, for me to defer the hearing of evidence on damage. But if the parties are looking, as no doubt they may be, to rights of appeal, there are really serious difficulties about that. -- If I

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came back and gave a decision attaching liability to the Defendant and the Plaintiff wanted to appeal, unless I state what the damages are, so that I give some verdict for damages and judgment accordingly, I do not see how I can make any order or give any judgment which would be regarded

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as, or would be a final judgment of this Court. If all that was desired was an appeal to the Full Court, there was a way we devised in an earlier case. We used the provision under which I may state a case on questions of law. It was rather inapt, but we thought it was legally workable. But if you want it to go anywhere else, I do not think you can do it, myself.

Plaintiffs
Evidence

14th February
1963
continued

10 MR. ASH: At this stage it does not present any difficulties.

HIS HONOUR: Of course, if I found against you I could then say, "I do not propose to go into any comment concerning damages. I will direct that a judgment be entered for the Defendant," and then you would have a final judgment.

MR. MEARES: And the admission would be useful.

HIS HONOUR: Yes.

20 MR. ASH: I can foresee that it is possible for either party to discover some point of law, whichever way the verdict went on liability. It is quite clear my friend and I are in complete agreement as to all procedural assistance to achieve the object of not proceeding with damages now. If Your Honor did find in favour of the Plaintiff, we could address our minds to the question of damages ourselves, and I think my friend would bear me out - we have not had time. Maybe before Your Honor, we could reach an agreement in certain events. It may be comparatively easy. But would Your Honor bear that generally in mind, that we are both wishing to achieve every procedural benefit to avoid going into damages at this stage, and neither of us wish to be pre-judged.

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On that basis, I will close my case at this moment.

CASE FOR THE DEFENDANT

No.23

EVIDENCE OF H.H.S.PARKER.

HOWARD HENRY SHELLEY PARKER
Sworn, examined as under:

Defendants
Evidence

No.23

40 MR. MEARES: Q. I think your full name is Howard Henry Shelly Parker, and you reside at 57 West Street, Balgowlah. You graduated as a Bachelor of Science, University of Sydney, in 1925 -

H.H.S.Parker
14th February
1963
Examination

Defendants
Evidence

No.23
H.H.S.Parker
14th February
1963
Examination
continued

MR. ASH: I notice - and I have no objection to it in the circumstances, that Professor Hunter is in Court. It may be that Mr. Parker has worked in conjunction with Professor Hunter. I do not know whether Professor Hunter is giving complementary or identical evidence to Mr. Parker. Might I speak to my friend? (Counsel confer).

I have no objection to Professor Hunter, who is to be called, remaining in Court during certain of Mr. Parker's evidence. If there is pure opinion evidence of a certain type, I may renew my request. 10

MR. MEARES: Q. I think, during the first year after graduating, you carried out some research work at the University in a branch of chemistry that has nothing to do with the problems with which we are concerned here? A. That is so.

Q. And that from 1926 until 1931, you were employed in commerce, as a scientist. I think on your first appointment you had the task to investigate whether you could produce power alcohol from prickly pear? A. That is so. 20

Q. And you were completely successful in that task, in that you established, did you, that you could not? A. Yes.

Q. And the company closed down as a result. Thereafter were you engaged with an engineering company doing experimental work with oil burners and oil burning equipment? A. I was.

Q. In regard to the efficiency and combustibility of various fuels? A. That is so. 30

Q. In November 1927 you were with another company, doing research not connected with the problem we have here? A. That is so.

Q. In 1927 and 1930 you were not engaged in any duties involving scientific questions? A. That is so.

Q. And in 1931 you were appointed to the Department of Organic Chemistry at the University. Your duties, in the first instance, from taking that appointment, were demonstrating and looking after the laboratory, and thereafter you were lecturing and training senior students in practical chemistry? A. That is so. 40

Q. And in 1948 you were transferred to the

Department of Chemical Engineering, under Professor Hunter? A. Yes.

Q. And you have been in that position since 1948? A. Yes.

Q. So that would take you a matter of 25 odd years at the University in the Department of Chemical Engineering? A. Not quite 25 in the Department of Chemical Engineering.

10 Q. I am sorry, 14 to 15, but at the University a matter of approximately - A. 32 years.

Q. And your duties in the Department of Chemical Engineering have been to lecture and supervise some of the practical work of the fourth year students, and also to supervise some of the practical work of junior students in all engineering departments, and those duties have included classes dealing with fuels and fuel oils, testing fuel oils, problems of testing and problems of lubricating oils and other engineering materials? A. That is a brief description of what I have done.

20

Q. And the work of the practical classes you have taken for some years consists of fuel testing gaseous and solid liquids, both carbonaceous and hydro-carbon? A. Yes.

Q. Of a determination of open and closed cup flash points and in considering distillation problems and other properties of fuel? A. That is so.

30 Q. I think it is proper to say that recently you have been primarily concerned, however, with special lectures on the question of corrosion? A. Yes.

Q. How long has that been for? A. That would be about four years.

Q. As far as coal is concerned, would you describe that as a hydrocarbon fuel? A. Certainly not.

40 Q. Have you ever heard that scientific name attributed to it in your life, or that name or that description? A. Not before I was present in this Court.

Q. I think that prior to the hearing of a case before Kinsella J., brought by Morts Dock against

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963

Examination
continued

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963

Examination
continued

Overseas Tankship you, in conjunction with Professor Hunter, undertook a large number of tests to determine the combustion and inflammable properties of fuel oil? A. Yes.

HIS HONOUR: Q. It may not be of great importance, but you have raised the question. On your classification or according to your knowledge, what is a hydro-carbon fuel? Could you give a short answer to that or would you have to go into a lot of detail? A. I can give a reasonably short answer. 10

Q. Would you please do so? A. A hydro-carbon fuel is one in which the primary chemical molecules comprising that fuel are built up of carbon and hydrogen atoms. Hydro-carbon fuel which fulfils that definition may still contain very small quantities of other chemical atoms, but that does not justify calling it any other type of fuel. It is still a hydro-carbon fuel.

MR. MEARES: Q. And I think, additional to the tests that you did prior to and during the case that I have mentioned, have you since then and recently done further tests in relation to the problem that the Court is presented with in this case? A. I have. 20

Q. In any of the tests in which you used oil, did you use any oil of particular flash point? A. I did.

Q. What was the flash point? A. 170 degrees Fahrenheit. 30

Q. Is that the Pensky-Martin closed cup test? A. That is as measured by the Pensky-Martin closed cup test.

Q. P-e-n-s-k-y - A. M-a-r-t-e-n-s is the correct spelling.

Q. As far as the flash point test is concerned, is that a test made to determine the heat at which oil must be brought in the closed cup, to achieve a momentary flash? A. I would amend one word, if I may. It is the temperature to which the oil is brought. 40

Q. What is the difference in the closed cup test, between the flash point temperature and the temperature at which the oil or vapours from it will ignite and burn? A. Will burn continuously?

Q. Yes? A. Well, the Pensky-Martens flash point is always lower than the open cup test.

Q. No. I am dealing with ignition in the closed cup. A. I am sorry. I must have misread your question. May I have it again?

Q. Leaving out any problems of open air, at what point will oil ignite and continue to burn, with a flashpoint of 170 degrees? A. That will be measured by the Cleveland open cup flashpoint, and the difference in temperature there can be of the order of 60 degrees Fah.; in other words, the equivalent open cup fire point can be 60 degrees higher than the flashpoint as measured in the Pensky-Martens apparatus.

Q. Would the flashpoint of oil be higher if it were done in the open air, than if it were done in the closed cup test that you have described? A. Yes.

Q. To what extent? A. Well, the equivalent open cup test is one measure of that. If one takes practical conditions of igniting oil on a large surface of anything, then the fire point of the oil, that is the temperature at which it will burn continuously, will be still higher than the fire point as measured in the equivalent open cup method.

HIS HONOUR. Q. In the open or open cup method of measuring, can you determine a flashpoint?

A. You can determine a flashpoint, yes. There is an equivalent open cup flashpoint, as well as a fire point, determined by the equivalent open cup.

Q. You have been making some comparisons between the open fire point and the closed flashpoint, have you not? A. Yes.

Q. I wondered whether you could make some comparisons between the open fire point and the open flashpoint? A. Yes, most definitely.

Q. What would you say about that? A. With this oil which I tested, this oil with a Pensky-Martens flashpoint of 170 degrees Fah., the equivalent open cup flashpoint was of the order of 230 degrees Fah., and the equivalent open cup fire point varied from five to seven degrees Fah. higher than that again. Does that answer your question?

Defendants
Evidence

No.23

H.H.S.Parker

14th February
1963

Examination
continued

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963
Examination
continued

Q. Yes, it does. Correct me if I am wrong. I suppose you do not get a fire point result in a closed cup apparatus? A. You do not.

Q. Because you do not have the conditions under which you can have fire? A. You do not have sufficient oxygen present.

MR. MEARES: Q. Would the equivalent open cup flashpoint; fire point test, simulate open air conditions, or would the ability to flash the oil and fire it need more heat, in open conditions, than the equivalent open cup test? A. I have not measured the actual amount of difference, but I would say quite definitely that the flash point or the fire point under completely open conditions would be higher than the flash point and the fire point as measured in the equivalent open cup.

10

Q. Would it be appreciably higher or only minimally so? A. That would depend on conditions. One condition which would affect that very materially would be the presence of air currents, and the higher the rate of air movement, the higher the velocity of the air, the greater would be the difference, the higher would be the temperature required in the open.

20

Q. Can you take it any further than that? If you cannot, say so. Take a wind of say 15 miles per hour in the open? A. I cannot give an exact figure. I would say that it would be very greatly increased.

30

Q. I think you have spent a large number of hours with various tests that you have made, have you not? A. Somewhere around about 500 man hours altogether, minimum.

Q. Have you also made an inspection of the Sheerlegs Wharf? A. Yes.

Q. Were your tests made both in the laboratory and in open air? A. They were.

Q. And under various wind conditions? A. Yes.

Q. And using various possible igniting materials? A. Yes.

40

Q. It has been suggested here that the existence of oil underneath the Sheerlegs Wharf would be far better, for the purpose of igniting it, and oil on the open harbour, because, as I

understand it, it is suggested that underneath the wharf there would be still air, and as a result you would get a collection of more vapour above the oil than you would get on the waters in the open harbour, and that would assist combustion. Would you express your views on that?

A. I find that very hard to believe; for three reasons. I have spent in my youth, or misspent, considerable amounts of time under wharves, 10 fishing, and I have never been under one where there was not a draught of some sort, a measurable current of air. Secondly, what is known as the distillation range of this particular oil - and I presume you are still referring to the furnace oil with a flash point of 170 - is so high that under the conditions of temperature existing under that wharf, there would not be enough heat exchange on the atmosphere to vaporise sufficient of the oil to build up to a dangerous concentration; 20 and thirdly - this is pure supposition - one has to take into effect any sunlight which might be present, and sunlight beating directly down on the surface of oil, completely unencumbered, would raise it to a temperature I think perhaps a little bit higher than it would attain under a wharf. In other words, I cannot see that under the wharf such as you describe, there would be any chance whatsoever of a build-up of dangerous vapours.

30 Q. Comparing, in your experience that you have indicated, and with your knowledge of the Sheerlegs Wharf, the relative dangers of oil catching alight under the wharf or catching alight in the open harbour, which would you say would present the greatest risk, the oil under the wharf or the oil on the open harbour? A. Well, if you were just going to postulate oil on the open harbour on the one hand, and oil without any qualifications, under the wharf, I would say that there would be 40 very little difference.

Q. Do you want to postulate anything else?
A. I would prefer you to do that. If you wish to make conditions, I will endeavour to interpret them.

Q. Take an ordinary November day with prevailing winds, and oil that had been around for a couple of days; to be more accurate, 58 hours. Would you imagine the risk was greater under those circumstances under the Sheerlegs Wharf or outside

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963

Examination
continued

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963
Examination
continued

of it? A. No, I would not.

HIS HONOUR: Q. You are speaking now simply of the atmospheric conditions affecting the oil, but leaving out of account any debatable question about whether it might be more likely to get an ignition agent near a wharf or in the open sea or anything of the sort? A. Just considering the two plain questions, oil in the open and oil under the wharf, no other factors mentioned.

HIS HONOUR: That is what I understood. 10

MR. MEARES: Q. First of all, as regards this fuel oil, you are aware of various descriptions given to liquids in the range of or under the name of "inflammable" and "combustible". Would you discuss the meaning of these expressions and the extent of the ranges? A. The combustible oil -

Q. Would you deal with inflammable first?

A. Yes. An inflammable oil is an oil which is reasonably easily lit by some source of heat and it will burn, will combust. A combustible oil or a combustible material is a material which will burn, but it is extremely difficult to ignite. There are classifications of these materials and one classification is that any oil or any material with a flash point of under 150, although classed as inflammable oil is a safe oil, and materials with flash points of over 170 are just not classed as inflammable oils at all. They are non-flammable oils; in other words, they are extremely difficult to ignite. They are regarded as safe materials. 20 30

Q. Would you give us some examples - I do not know whether you can - of liquids and other things that are combustible, that are in every-day use, with flash points under 170? A. Ordinary petrol is such an example, definitely classed as a dangerous liquid. Its flash point is minus 40 degrees Fahrenheit. In other words, at any temperature down to 40 degrees flash point this oil is still dangerous; it will flash if a small flame or spark is applied to it. 40

Q. I was seeking something, if there is such a thing, which no one really looks upon as being combustible or inflammable, apart from a scientist? A. Well, whisky, like other materials containing carbon compounds, is combustible and it will have a definitely flash point. I have never

measured this myself but I would say it would be of the order of say between 70 and 100 Fahrenheit, depending entirely on the proof strength of the whisky, in other words, the amount of alcohol in it.

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963
Examination
continued

10 Q. Since the Morts Dock fire, have you made any search for the purpose of ascertaining whether there is any literature available on the happening of fires of fuel oil on water? A.Yes, I have.

20 Q. What have you done? A. There is a publication prepared by a joint committee of the Department of Scientific and Industrial Research in Britain, together with what they describe as the fire officers, that is, various officials of the fire insurance companies. This joint committee has prepared an index of references to all matters dealing with fires. It is a very complete index divided into a number of sections. The first two of those sections or the first one, section A - (Objected to).

Q. Where is this reference? A. It is available in the New South Wales Public Library.

Q. What size is it? A. Foolscap roneod bindings. There are eleven parts to this index, and, all told, it contains something over 10,000 references to fires and related matters.

30 MR. MEARES: I can bring the thing here, of course, and my friend can take the point but the evidence I propose to lead is that he searched the index, and what the result of the search was, without giving any contents of the index. I can do it another way. I can bring the document here.

MR. ASH: I do not object.

MR. MEARES: Q. Tell me the date of this. A. It covers the years 1944 to 1959 inclusive.

40 HIS HONOUR: Q. Do you mean that it was published in parts appearing during those years, or that it relates to events happening during those years? A. Well, it was published in parts over those years, and it relates to happenings that occurred during that same period.

MR. MEARES: Q. Did you search for any information of any sort dealing with fires caused by oil fuels on water? A. I did.

Q. And were you able to find any such reference?

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963
Examination
continued

A. Out of, I think it was 2,090 references,-- there was one reference only to a fire of oil on water.

Q. Do you remember where that was? A. Yes. It was in Kansas City.

Q. And when? A. It was recorded in July 1951.

Q. Caused by what? (Objected to; not pressed.)

HIS HONOUR: Q. This is an English thing, is it? 10
A. No; it is a United States publication. No, which, the record of this fire or the whole thing?

Q. The index you are talking about? A. The index is an English publication.

Q. So these people did not hear of the "Panamanian" or of the "Corrimal" apparently?

A. Well, it was not indexed under those names.

MR. MEARES: Q. Prior to the Morts Dock Fire, had you ever heard of an oil fire on water. 20
A. No.

Q. Have you seen a manual issued by the United States Coastguard, of July 2nd, 1951? A. Yes.

Q. Would you look at this document? Is that the document to which you refer? A. This is the manual for the safe handling of inflammable and combustible liquids. I have seen that before, yes.

(Abovementioned publication tendered; handed to Mr. Ash; decision postponed.) 30

HIS HONOUR: Q. Going back to this index you spoke about, does the publication itself tell you what were the methods by which the information was collected that appears in this index?

A. The information which appears in the index is only a record of the titles of papers describing the fires, which occur in journals and other sources.

Q. It is simply an index to publications? A. Yes. 40

Q. A bibliography? A. Yes.

MR. MEARES: Q. I think in 1926, you had done some experiments relating to the combustion of

fuel oil and the ability to combust it, had you not? A. Yes.

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963
Examination
continued

10 Q. If I had put to you a hypothetical or an actual case of large quantities of fuel oil of 170 degrees flash point being spilt out of the "Wagon Mound" and its concentration and its extent in and around Mort Bay and elsewhere, as you have described in the evidence, that it was spilt on October 30th, first of all what would you have thought of the fire risk, if any, of that oil? A. At that time?

Q. Yes? A. One has to try to dissociate one's mind from recent happenings, but bearing in mind certain fundamental facts and my experience with oil burners, I would have said there was no possibility of oil on open water becoming ignited.

20 Q. Supposing somebody had proposed to you, in addition to the facts I have given you, that in ship repairing yards around the harbour and in and along ships and wharves in the harbour where the oil was, there was oxy-acetylene and burning being carried out. Supposing somebody has specifically put that to you, what would your answer or opinion be under those circumstances? (Objected to; allowed.)

Q. What is your answer? A. I am sorry.

30 Q. Supposing you had been given the added factor which I have mentioned, to the best of your ability what would your view have been with that extra factor, of any fire risk igniting oil on water? A. The fire being caused directly as a result and only as the result of oxy-welding and cutting?

Q. If I had simply told you - and I have - that there was welding and burning going on above the water, as the result of ship-building industry, and on wharves? A. Well above the water, on the top of the wharf?

40 Q. Yes? A. As the direct result of that, I would say that there would be no chance of the oil being ignited, for one very special reason. To be ignited by the operations of oxy-welding and cutting presupposes that a particle of metal of some reasonable size and in a red-hot condition, drops on the side of the welding or cutting on to the surface of the oil. It will reach the surface of the oil at some considerable

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963

Examination
continued

velocity and go straight through. It is a well known fact - and a considerable number of scientific workers have done research on this matter; that where you drop a solid body into a liquid, after the solid body has passed through, there is always a small geyser of the liquid which comes up in the place where the particle went down. Where you have a composite layer of oil and water, that geyser will consist also of oil and water. Now, if the metal particles had been large enough and hot enough to cause ignition of the oil that geyser of very cold water and oil coming up from underneath, would extinguish it.

10

Q. If I had put that factor, that you have been dealing with, to you in 1951, would the thought of a wick have occurred to you?

A. That there is a possibility of a fire occurring?

Q. Yes. Would it have occurred to you?

20

A. Not in that context. One knows that a wick will burn. One has used oil lamps before, but in that context, I think not.

Q. Recently have you done certain tests in relation to the ideal types of wicks to burn oil on water? A. Yes.

Q. What, in your opinion, is the ideal type of work? A. You mean as regards size or material or both?

Q. First of all, material, and then we will deal with size? A. Any combustible fibrous material would be satisfactory - jute, woven woollen material, woven cotton material, cotton waste. Cotton waste is an ideal wick. I think perhaps that might be the best.

30

Q. Cotton waste dry or cotton waste impregnated with oil? A. Well, how are you going to get your cotton waste on to the oil? Am I to suppose that you have just got a piece of cotton waste that has just suddenly appeared on the surface of the oil?

40

Q. I want you to imagine a piece of cotton waste on the oil, firstly dry and secondly, impregnated, on to the oil? A. Which has been dropped on to the oil?

Q. It has got there some way. A. May we suppose it has dropped on to the oil?

Q. Very well. A. If we consider the dry cotton waste first, this will absorb the furnace oil, which will remain mostly on the outside of the bundle of cotton waste. If you like to take a bundle of cotton waste of any size, a handful, the furnace oil will be accumulated around the outside of that rough sphere. The cotton waste will absorb the oil onto its surface, very rapidly it will sink through the composite layer of oil and water, and if the layer of oil is reasonably thin - supposing, we say, 1/16th of an inch - the waste will absorb the greater part of the oil off the surface of the water, that is, if the surface of the water is small in relation to the waste. It will sink right through and the cotton waste will become saturated with water. There will be a small portion of the waste remaining above the level of the liquids and that will also be wet with water. That sinking will take place over the matter of, in some experiments I did, five minutes, some half an hour, but it sank comparatively quickly.

With the cotton waste saturated with oil - and I did a definite experiment and compared it with the dry one - the cotton waste saturated with used lubricating oil, approximately an equal amount of oil to the weight of the cotton waste - they were both dropped from the same height. Certainly one was dropped on to 1/16th of an inch of oil, and the oil waste was dropped onto a thicker layer of oil, 3/8ths of an inch, but they both sank right through the furnace oil in five minutes.

Q. What height? A. The height from which they were dropped, 6 inches.

Q. If they were dropped from a greater height, what they? A. They would sink more quickly.

Q. Could you give us any idea, assuming cotton waste were thrown over a wharf a distance of 10 ft., 12 ft., either dry or impregnated with oil, of the type that is used by men in industry to clean machinery and hands and so on, as to what the life span of that would be before it sank? A. I did quite a number of experiments on that factor and the longest time over which a wick floated, whether it were dry or oily, was between three and four hours - I think, from memory, three hours forty minutes.

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963

Examination
continued

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963

Examination
continued

Q. What was the average time? A. Most of them were very much quicker than that. For example, the ones I did the other day, five minutes; quite a number, half an hour.

Q. Even before they sink, would they become increasingly difficult to ignite or not? A. The dry one would, yes, because it would absorb water more rapidly than the oily one.

Q. And the oily one? A. The oily one would ultimately become quite safe, because in a number of experiments which I have done, water has displaced the oil with which the waste was originally wet, thus rendering it quite safe.

10

Q. Have you considered this problem and done tests in relation to woollen materials? A. Yes.

Q. What did you find in regard to that? A. I found that the woollen material sank even more quickly than the cotton, two minutes.

Q. Following upon a suggestion that wood was the igniting source, a spark or molten metal or slag coming from the oxy-acetylene or electric welder, did you do certain tests in relation to wood? A. Yes.

20

Q. What were the tests? A. Two tests. I took one piece of wood and saturated it in the water. Another piece of wood I just let stand until I was ready to conduct the experiment and, at the same time, I poured sufficient oil over the surface of these pieces of wood to run off the sides; in other words, there was roughly a uniform thickness of oil on the top of both pieces of wood. I then dropped red-hot pieces of metal onto the tops of the two pieces of wood, pieces of metal of a size comparable with those which one would get from oxy cutting operations.

30

Q. From what height? A. 2 feet.

Q. And were you able to ignite, on any occasion, either piece of wood? A. No.

Q. I think it has been said that a cigarette on cotton waste could ignite cotton waste. What would be your views about that? A. Well, like all these things, there must be certain conditions holding. The hot end of the cigarette must be in contact with the cotton waste. In other words, you have not a 50 per cent chance of it igniting and, in addition, you must have a

40

certain amount of wind and air current to fan the cigarette to a temperature high enough to ignite the cotton waste. If it once gets the cotton waste to blow, then the chances are that the cigarette would set the cotton waste on fire.

10 Q. I want you to imagine somebody blowing cotton waste and purposely causing it to smoulder and ultimately catch alight. Have you done any tests or made any calculations for the purpose of ascertaining the velocity that would be introduced in blowing sufficiently to ignite cotton waste? A. Yes, two series.

Q. I do not want to go into the details, but what conclusions did you reach? A. As the result of the more accurate series of experiments I found that it was possible to produce a blast of air out of the mouth varying from 25 up to 59 miles per hour.

20 Q. When you say "possible to produce a blast", was the 25 miles per hour doing the best you could or just blowing very quietly, hardly blowing at all? A. No. That was just taking a normal breath, with the 25. The 59 was taking a deep breath and blowing as hard as possible. Of course it is possible to blow at a velocity much less than 25.

Q. May I take you to certain tests which you have -

30 HIS HONOUR: Q. Did you try out this business of getting the cotton waste to burn, by blowing yourself? A. Not actually at the same time as I was doing the mouth blowing tests.

MR. MEARES: Q. But otherwise? A. But otherwise have I tried the effect of wind?

Q. Yes. A. Yes.

HIS HONOUR: Q. I meant the effect of blowing? A. Yes, I have.

MR. MEARES: Q. And have you achieved success by blowing? A. Yes.

40 HIS HONOUR: Q. Buy only by vigorous blowing or also by gentle blowing? A. With both, with gentle blowing and with vigorous blowing.

MR. MEARES: Q. What other conditions did you have? Was it dry or oily cotton waste? A. I tried some dry and some oily. Usually with the

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963

Examination
continued

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963

Examination
continued

oily waste it would ignite fairly readily. With the dry cotton waste, and particularly with the lower velocities of air, the percentage excess say in any series of experiments was less, in other words, it did not light as easily.

Q. I think you have documented the result of a number of tests that you did in connection with the action brought by Morts Dock before Kinsella J? A. Yes.

(Exhibits 5 to 16 in former action,
tendered.)

10

Q. As far as these tests were concerned, were you present at all of them? A. Yes.

Q. And were you responsible for setting the tests up and obtaining the necessary material and apparatus? A. Yes, with one exception. I did not obtain the oil.

Q. You had people assisting you in various tests, did you not? A. Yes.

Q. As far as Professor Hunter was concerned, was he present at the majority of the tests? I am not suggesting he was there all the time. A. Professor Hunter was present at the majority of the tests and he was present at tests representative of all the different classes of tests that I did. For instance, he was present at some waste, some hessian and so on.

20

Q. I take the first test, Exhibit 5, ignition tests of fuel oil igniting agents in open air. First of all, in that test you used various possible igniting agents - cigarette butts, cigarette lighter, safety matches, wax matches, burning glass, red-hot cokes, fireworks, red-hot metals and direct flames from an oxy-acetylene torch - and your tests were done in relation to oil layer thicknesses varying between 1/16th of an inch and 3/8th of an inch? A. Yes.

30

Q. And was the oil placed on salt water? A. Yes.

Q. And did you have an accurate means of determining the thickness of the oil on water? A. I did.

40

Q. What was it? A. The device which I used for determining this thickness is known in engineering circles as a point gauge. It is described in

that bible of chemical engineers, Perry's Handbook of the "Chemical Engineer" and it consists of essentially, a point on the end of a metal spindle. This point is held in a sleeve adjacent to the film of oil which one wishes to determine, or adjacent to the container in which one is going to put that oil. If I represent the container by my spectacle case, the sleeve in which this slides is held absolutely rigidly in relation to this dish. It cannot move in any direction whatsoever. The only direction in which this point can move is vertically, up and down. To get a film of oil of a certain thickness on a dish, the procedure is this. One sets up the stand for this gauge and puts the point of the gauge at a level in the dish corresponding with the level of the water which you wish to obtain, and on the top of this spindle there is a collar which prevents it sliding below a certain point in its holder. Water is then poured into the dish until such time as the surface of the water just touches the point of this needle. Now there is no doubt whatsoever about when that happens, because as soon as it does, as soon as the meniscus or the surface of the water is pricked by this gauge, the meniscus forms and there is the appearance of a small but very rapid movement, and one gets a light reflection effect around there, and there is no doubt whatsoever about it. That is the level of the water in the dish.

If one wants to place on that dish a layer of oil of say one-sixteenth of an inch thick, one takes a distance piece, a small disc of metal with a hole in the middle, exactly one-sixteenth of an inch in thickness. You pull the point gauge out of the holder, put the disc on there -

MR. MEARES: Q. On the holder? A. On the top of the collar, and you put the point gauge back in the holder. The point is then one-sixteenth of an inch above the surface of the water, and you again repeat the pouring performance, this time with the oil, until the point again pricks the surface of the oil. You see this movement and one can assume then that the oil is reasonably one-sixteenth of an inch thick, but to make absolutely certain, the point is lifted, the end of it is wiped, it is put back and again the level of oil is adjusted until it touches again. The reason you get a false reading is that if you

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963

Examination
continued

Defendants
Evidence

No.23

H.H.S.Parker

14th February
1963

Examination
continued

pour into one end of the dish, there is a slight slope in the oil film as it spreads along the dish, but by taking two readings one can get a very accurate determination, one can put on the water a layer of oil with a very great degree of accuracy, as regards thickness.

Q. Is that the only method known to you?
A. That is the best method.

Q. And did you adopt that method in regard to every test you did? A. I did.

10

Q. Having a look at Exhibit 5, it would appear, would it not, that you got no positive results with oil of one-sixteenth of an inch? A. That is correct.

Q. And as far as the fireworks fell over the oil and dropped are concerned, could you give us any idea what heat the firework you used would generate? A. Yes. I used a Roman candle and the temperature generated by the flame of that Roman candle would be of the order of 1,000 degrees Centigrade. I cannot give it exactly.

20

HIS HONOUR: Q. It is said here that this is held over the oil. How far from the oil? A. That was critical, to a certain degree. If the Roman candle were held in such a way that the blast from it impinged on the oil vertically, downwards, in that nature, no ignition took place, but by holding a Roman candle at an angle of roughly 45 degrees ignition of the oil would take place every time.

30

Q. But if you got it close down to the surface -
A. Yes, a matter of two to three inches away from the surface of the oil, that would ignite the oil every time.

MR. MEARES: Q. Except on one-sixteenth of an inch?

A. Except on one-sixteenth of an inch. I beg your pardon, yes. Roman candles of the better type usually conclude their performance with a small explosion and in every case this explosion blew out the flame which it had started previously.

40

Q. As far as the one-sixteenth inch oil is concerned, you could not even light it with an oxy-acetylene torch held 6 inches above the oil?

A. No, no chance.

Q. Did you take 6 inches above the oil as being

the ideal distance for ignition? A. I tried all distances with the oxy torch. I did not record them here because many of the other experiments were done at 6 inches. There was no real reason, I suppose, for that, except that it was a handy height. But with the oxy torch held over the oil, providing it was greater than one-sixteenth of an inch thick, it would light.

Defendants
Evidence

—————
No.23

H.H.S.Parker
14th February
1963

Examination
continued

10 Q. Apart from success with the fireworks and with the direct application of the oxy-acetylene torch, you got otherwise negative results in the oil of the four different thicknesses, with the exception of the ability to ignite a piece of red-hot coke dropped from a height of 2 feet, with oil a quarter of an inch thick? A. Yes.

Q. What was the size of the piece of coke?
A. About that size, I suppose 4 centimetres in diameter.

20 HIS HONOUR: Q. Could you give any theoretical reason why you got a yes result at one-quarter of an inch, but got a no result both at one-eighth of an inch and three-eighths of an inch? A. Yes. Coke varies very greatly in specific gravity, that is, weight per unit volume. In other words, some pieces of coke are heavier than others. The lighter pieces will stay on the surface of the oil longer, in other words, a long enough time to ignite it. The heavier pieces will go straight through and will not ignite it. One gets that
30 geyser effect with them.

HIS HONOUR: I am sorry, but that does not explain it to me at all.

MR. MEARES: Q. Keep going. You say that it is quite impossible that the pieces of coke that you used in the experiments on different thicknesses of oil, varied in weight? A. And they varied in weight on the same thickness of oil. That is why there are some contradictory results here.

40 Q. Just take it as far as the pieces of coke are concerned. With the red-hot coke dropped 6 inches, you got no result with any thickness of oil. With the red-hot coke dropped on 2 feet, you got one positive result but that result was not with the thickest layer of oil? A. Yes. That depended on the weight of the coke and not the thickness of the oil.

Q. You suggest, do you, that the weight of the

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963

Examination
continued

coke in which you got the successful result, was probably - A. Lighter.

Q. And stayed longer on the oil before it sank? A. Yes.

HIS HONOUR: Q. If you used another piece of coke of that same weight and you tested it with the three-eighth inch oil, you would expect to get a positive result there too? A. Yes.

Q. I understand now. You have got coke of different weights used in these different tests. Is that right? A. They were not deliberately taken as different weights. The pieces of coke were chosen to be of uniform size, uniform volume, but, in the nature of coke they could be, although uniform in size, very different in weight. 10

MR. MEARES: Q. May I come to your next test? You did some wick experiments, Exhibit 6. You did those tests with hessian of varying sizes, with oil of varying thicknesses, in still and open air? A. Yes. 20

Q. Would you tell me whether there was any wind velocity in the open air when you did the tests? A. It was a light wind, about 6 to 7 miles an hour.

Q. And those tests establish, do they not, summarising them, that the larger the piece of hessian of the pieces you tried, the greater the success? A. That is quite correct.

Q. And as far as the tests indicate, or the result of them, there does not seem to be a great difference, if you look at them, between the success factor in still air or open air, with the exception, I think, that you got one positive result more in still air than you did in open air? A. That is with the 3 x 3. 30

Q. Have you any comment to make on that now? A. Yes. There is a certain amount of chance in these things. This particular piece of hessian may have sunk a little bit more quickly than the other one, the one in still air. The one in open air may have sunk a little more - 40

Q. Having done the tests, could you tell me what you did, and from your experience with other tests? You would have a better chance of igniting oil in open waters with hessian or where the air was quite still, or cannot you say? A. It

is one of these things which has to be qualified a little. With the thin layers of oil, one-sixteenth of an inch, it does not matter where it is. It just will not light. If one has a sufficiently large wick and a wick with an irregular outer surface, that will light the oil more easily than a uniform wick. A small amount of breeze tends to make the ignition of the oil more certain, whatever the size of the wick.

10 Q. May I refer you to a document numbered Exhibit 9 which contains the results of tests of cotton waste in a wind velocity -

HIS HONOUR: Q. Before we leave the one which was Exhibit 6, I am not quite sure how you test about this test. It is described as a test with burning hessian, with the test pieces suspended half on oil. What exactly does that mean, what did you do? A. This was to make quite sure that the wick action came into play and where say a
20 piece of hessian 3 inches x 1 inch was used, it was suspended by a small holding device, so that the wick was bent around in the form of a right angle, and $1\frac{1}{2}$ inches of it was lying on the oil and $1\frac{1}{2}$ inches was suspended in the air.

Q. What did you do in relation to making the hessian burn? A. I just lit the wick with a match, at the top of it.

(Short adjournment.)

30 (Exhibits 5 to 16 in former action admitted and marked :-
Exhibit 1 (5-7), (9-10), (12 to 16).

(Witness stood down).

No.24

EVIDENCE OF C. McCABE

CHARLES McCABE

Sworn; examined as under:

MR. HOLLAND: Q. Your full name is Charles McCabe? A. Yes.

Q. I think you live at 188 Short Street, Balmain? A. Yes.

40 Q. And you are an ironworker by occupation? A. Yes.

Q. You are at present employed at Cockatoo Dock, are you not? A. Yes.

Defendants
Evidence

No.23

H.H.S.Parker
14th February
1963

Examination
continued

No.24

C. McCabe
14th February
1963
Examination

Defendants
Evidence

No.24

C. McCabe
14th February
1963

Examination
continued

Q. I think in October - November 1961 you were employed by Morts Dock & Engineering Co.?

A. That is right.

Q. As an ironworker? A. Yes.

Q. And you were employed at Morts Dock, in Mort Bay? A. Yes.

Q. I think you worked in that capacity at Morts Dock, from 1947 until 1956? A. Yes.

Q. What work were you doing? A. I was assisting a boilermaker called Ken Osborne, putting doublers on a mast. 10

Q. Do you remember where the mast was on the wharf? A. Yes. It was amidships of the "Corrimal", fore and aft.

Q. Whereabouts in relation to amidships of the "Corrimal" were you working with Mr. Osborne?

A. Practically in front of it.

Q. Practically amidships. How far from the edge of the wharf? A. About 8 ft. It might be a bit more. I am not sure. 20

Q. Where was the "Corrimal" in relation to the wharf, hard up against the wharf? A. No. she was fendered off to stop rubbing of the boat.

Q. How far? A. I would say about 3 ft.

Q. Do you recollect a fire which took place in November 1951? A. Yes.

Q. At the time the fire took place, were you working in the position you have described?

A. Yes.

Q. Before the fire took place did you do something? A. Before the fire took place? 30

Q. Did you notice something? A. I noticed smoke come up.

Q. How did you come to notice this smoke come up? A. On the edge of the wharf like that, the welding terminals were there.

Q. The electric terminals for the welding machine? A. Yes. I took it to be a short from that.

Q. First of all, what did you see? A. When I looked over- 40

Q. Before you looked over, what did you see?

A. I saw a fire, black smoke coming up.

(Answer concerning electrical short objected to; application to strike out refused)

Defendants
Evidence

—
No.24

Q. You say you saw this fire, with smoke. In what sort of quantity was it? A. Only a wisp.

C. McCabe

14th February
1963

HIS HONOUR: Q. Right near the edge of the wharf; was it? A. Yes. As I looked over the wharf, it was just outside the wharf.

Examination
continued

10 MR. HOLLAND: Q. Did you go to the edge of the wharf? A. Yes, and looked over and as I looked over -

Q. Tell His Honour what you saw? A. I saw a piece of debris, with some material smouldering on it.

Q. First of all, would you describe the debris you saw? A. It might have been bark or cardboard. I am not so sure what kind of material it was.

20 Q. Could you indicate the size of it? A. It would be about 15 inches.

Q. In length. What about the width of it? A. Say about 3 inches or a little bit more.

Q. Then you said a piece of material smouldering on it? A. Yes.

Q. What size was the piece of material? A. It was not too big.

30 Q. About the size of your closed fist? A. I think you would be able to clutch it in your hand.

Q. What kind of material was it? A. I could not rightly say.

Q. Can you say anything about its colour? A. No. It was just smouldering. I just saw it smouldering and did not take any notice of it.

Q. What do you mean by smouldering? A. The smoke spiralling up out of it.

40 Q. Where was this object in relation to the edge of the wharf, of the "Corrimal"? A. It was near a pile just there. It was a distance away from that.

Defendants
Evidence

No.24

C. McCabe

14th February
1963

Examination
continued

Q. Can you give us some idea of the distance away from the pile? A. Say a couple of inches, 2 or 3 inches.

HIS HONOUR: Q. That is out from the pile. Do you mean towards the "Corrimal"? A. Yes, from the "Corrimal".

Q. But it was 2 inches from the pile? A. Yes. It might be 2 or 3.

Q. In the direction of the ship? A. Yes, from the ship, into the pile.

10

MR.HOLLAND: Q. This 2 inches to 3 inches about which His Honour is asking you, was that seaward of the wharf or under the wharf? A. No. seaward of the wharf.

Q. Was it stationary? A. I never took much notice. It seemed to be floating.

Q. How long did you look at it? A. Only a second, if that.

Q. Having seen this, what did you do? A. I returned to my job.

20

Q. Did you tell anybody about it? A. No.

Q. You returned to your job. What happened after that? A. I was working away for a few minutes and then I noticed flame coming up the pile. I carried on with my job and then it spread onto the wharf and I soon got off the wharf then.

Q. What did you see actually when - A. I saw the flame coming up the pile.

Q. Any smoke? A. No. I could not rightly say. 30

Q. You could not rightly say whether there was smoke? A. No.

Q. Where were you standing when you saw this flame coming up the pile? A. Where I was working on the doubler.

Q. Was that at the mast or away from the mast? A. It would be 8 or 10 feet from the mast.

MR.HOLLAND: Q. Do you mean that the flames were eight to ten feet from the mast or you were eight to ten feet from the mast? A. I was. No; I was at the mast. I was working at the mast. 40

Q. Do you mean you were eight to ten feet from

the edge of the wharf? A. Yes, that is right.

Q. You saw these flames - just go on and tell us what you did? A. I was at the mast. The flames were up the pile and they spread on to the wharf, and then I got off the wharf and looked all round, and the flames were all over then.

Q. And what about your mate Osborne? A. I do not know what happened to him.

10 Q. And you left the wharf straight away at that stage, did you? A. Yes.

Q. Were there any other men in the vicinity of where you saw this spiral of smoke or "whisper" of smoke? A. Only the job I was on on the mast.

Q. Was anyone working on the ship? A. Yes.

20 Q. Do you recall anybody working on the ship? A. I recall Roy Stuart. He was a boilermaker. I recall him working there. He was working right aft of the bridge. In the morning I had a job painting plates. My mate Ken Osborne put the chalk on the plates and I painted them over, what had to be done with them.

HIS HONOUR: Q. Would you speak slowly and clearly so that we can all try and hear what you say? A. Will I have to go back?

HIS HONOUR: Yes.

30 WITNESS: In the morning I also had a job to paint up plates. The boilermakers chalk on them what has to be done on them and where they came from, and I had to paint over them. When I went aboard that morning there was an old ironworker named Ted Breen. He was there working with Roy Stuart the burner, and he asked me - (Objected to).

Q. I just want to find out where these men were working? A. Right aft of the bridge.

Q. And on the day of the fire was there burning going on aft of the bridge? A. Yes.

40 Q. Was there any other oxy or electric welding or oxy burning going on? A. I cannot recall any. There could have been. I could not rightly say. That is the only one I can recall.

HIS HONOUR: Q. What about a man called Taylor? Do you know where he was that day? A. I know Bill Taylor. No, I do not know where he was.

Defendants
Evidence

No.24

C. McCabe

14th February
1963

Examination
continued

Defendants
Evidence

—
No.24

C. McCabe
14th February
1963

Examination
continued

MR.HOLLAND: Q. How long had this oil been there, to your knowledge, prior to the fire? A. I thought it was about three days, but they said it was only two.

Q. Do you recall the first day you saw it?
A. The first day I saw it I was going over towards the Sheerlegs Wharf, and I had to pass the slipway, and I noticed oil on the slip, walking over with Jackie Hodgkiss.

Q. Do you remember the day of the week? 10
A. I know now it was Tuesday.

Q. You know now it was Tuesday, but you do not recollect the day, do you? A. No.

Q. What time of the day did you notice the oil?
A. It was after lunch.

Q. And what condition was it in? What did it look like? A. Black.

Q. Could you tell how thick it was? A. No.

Q. Could you see anything either on the Tuesday or up to the time of the fire resembling corrugations on the oil that you saw? A. No. 20

Q. Did you see anything resembling heaps of oil - the oil heaped up on itself? A. No; all I noticed was oil on the water.

Q. During the time you were working in Mort's were you doing the same kind of work? A. Yes.

Q. On ship repairing? A. Yes.

Q. And I suppose you have seen oxy and electric welding and burning going on -? A. Yes.

Q. On the wharf and on ships tied up alongside the wharf? A. Yes. 30

Q. In your, I think, eight years that you were there, have you ever seen these oxy and electric welding operations and burning start a fire on any debris or anything else on the water? A. No.

Q. Have you ever seen anything floating in the water alight or smouldering? A. No.

Q. Did you notice the condition of the piles -?
A. No.

Q. While the oil was there? A. No; I never took any notice. 40

Q. You never took any notice? A. No.

Q. And when you first saw this oil on the water did you consider it to be something that was likely to cause a fire? (Objected to; pressed; rejected).

Q. Have you ever been engaged in ship repairing work where oxy and electric welding and oxy burning had been going on in the presence of a substantial quantity of oil hanging around the ship or the water? A. No; only minor oil
10 noticeable on the water - very little.

Q. And working in that Bay have you noticed debris from time to time floating on the water near where you were working? A. Quite common.

Q. What have you noticed? A. Wood, beer bottles, coke, tin.

Q. Anything else that you can think of? A. No. Anything that floats - bags.

Q. You gave evidence, did you not in the first "Wagon Mound" Case? A. That is right.

20 Q. Before Mr. Justice Kinsella? A. Yes.

Q. The day after this fire were you interviewed? A. Yes; I was interviewed by Detective Sergeant Dimmock. (Objected to; question withdrawn).

Q. You have mentioned to Mr. Meares and to myself a matter that occurred between you and Mr. Murray the solicitor instructing Mr. Ash and his juniors? A. Yes.

30 Q. And you wanted to say something about that incident to His Honor? A. Yes.

Q. You wanted to "get it off your chest"? A. Yes.

Q. Will you tell His Honor what happened and when it happened?

HIS HONOUR: I take it that this is not objected to?

MR. ASH; It is a very difficult situation. It might be relevant to ask questions on it of Mr. McCabe, but it might be left in abeyance.

40 MR. HOLLAND: I am content with that. If my friend, of course, does not feel that in his cross-examination he has to touch on this question there is no point in bringing it up.

Defendants
Evidence

No.24

C. McCabe

14th February
1963

Examination
continued

Defendants
Evidence

MR.ASH: I think that that sums it up.

HIS HONOUR: I do not see how it could be admitted in chief.

No.24

C. McCabe

CROSS-EXAMINATION:

14th February
1963

MR, ASH: Q. Can you hear me? A. Yes.

Examination
continued

Q. You were working with Frank Godfrey, were you not? A. No; Ken Osborne.

Q. There was a burner near you called Frank Godfrey? A. Quite right.

Cross-
examination

Q. And you were all Morts men? A. All Mort's. 10

Q. And these other two fellows that you mentioned - these oxy welders - these burners -? A. Yes; all Mort's Dock men.

Q. You saw this debris floating on something on the water? A. Something floating on the debris.

Q. Wait a moment. The debris was floating on something which was floating on the water - is that what you say? A. No; There was something on the debris. 20

Q. It depends on what you call "debris"? Did you say there was something about the size that you could hold in your hand? A. Yes.

Q.It was on a bit of debris? A. Yes.

Q.And that was floating on the oil - the oil was on the water? A. Yes.

Q. And that bit of debris was smouldering? A. Yes.

Q. And there was smoke coming from it? A. That is quite right. 30

Q. And was it the smoke that attracted your attention? A. Yes.

Q. You being up on the wharf at the time? A. On the wharf, yes.

Q. Do you remember giving evidence in the previous case? A. That is quite right.

Q. And would this be true, that the fire "seemed to go, if I remember aright, under the wharf, back to the wharf and then went more aft of the ship"? A. I took it to come up the 40

pile onto the wharf.

Q. Do you remember saying that the fire "seemed to go, if I remember aright, under the wharf"? A. That was when I ran. . . .

Q. Did it go under the wharf? A. The fire was under the wharf.

Q. Do you remember giving evidence before? A. Yes; I remember being in the box, yes.

10 Q. And do you remember saying "The fire seemed to go, if I remember aright, under the wharf"? Did you say that? A. I think I must have said it if it is down there.

Q. Is it the truth? A. It must be if it is down there.

Q. And do you stick to it now? A. Well, I will have to.

Q. And do you? A. Yes.

Q. Of course you got off the wharf pretty quickly, did you? A. Yes..

20 Q. You lost some property, did you? A. No.

Q. You did not? A. No.

Q. Anyhow, you got off pretty quickly? A. Yes.

Q. And after you saw this floating object with the smoke, you got back to your job? A. Yes.

Q. You returned to your job? A. Yes.

Q. And do you remember saying this "Later on then it was smoke or flames coming from around the vicinity of the fire"? Do you remember saying that? A. Around the vicinity.

30 Q, Smoke or flames? A. It came up the pile -

Q. You have told me that. Do you remember saying that after you resumed your job and you were asked what did you notice, you said "Later on it was smoke or flames coming from around the vicinity of the pile"? A. That would be right.

Q. Is that right? A. That would be right.

MR. HOLLAND: No further questions.

Defendants
Evidence

No.24

C. McCabe

14th February
1963

Cross-
examination
continued

(Witness retired).

Defendants
Evidence

No.25

EVIDENCE OF H.H.S.PARKER (continued)

No.25

HOWARD HENRY SHELLEY PARKER,
Examination on former oath continued:

H.H.S.Parker
14th February
1963

Examination
continued

MR. MEARES: Q. Have you got your exhibits there? A. No.

Q. (Documents handed to witness). I want you to come now to Exhibit "1 (9)" - "Result of test of cotton waste ignition by smouldering oily cotton waste". First of all may I take it that that was done in the laboratory? A. That could have been either done in the laboratory or outside. 10

Q. Well, I notice "Wind velocity of 1.6 miles per hour"? Can you recall the circumstances under which you calculated that? A. I did not calculate that wind velocity. I measured that with the anemometer and it could have been a natural wind velocity or wind artificially produced.

Q. But you cannot recollect? A. I cannot recollect whether that was inside or outside. 20

MR. ASH: I do not pick up the full meaning of what was done from the heading of 1 (9).

MR. MEARES: Q. So far as the test 1 (9) is concerned, one observes that you used a certain type of oil on cotton waste, which is described in the exhibit - is that correct? A. Yes.

Q. Would you tell us what size piece of waste you used, or pieces of waste? A. Yes; they would be round about 20 grams. 30

Q. And could you describe that visually? A. Yes; about a handful.

Q. About an open handful? A. Not too open - compressed.

Q. Half? A. Yes.

Q. And as far as this waste was concerned, how did you ignite it? A. That was just lit with a match.

Q. And as far as the cotton waste was concerned, was it thoroughly impregnated with oil or not? A. Yes. 40

Q. To what extent, if you squeezed it? A. It

simply had an amount of oil at least equal to the weight of the cotton waste. If the cotton waste had been rubbed on anything dry, oil would have come off. You could say it was lightly saturated.

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Examination
continued

Q. And you had positive results under those circumstances, with the wind, with the layers of oil varying and with the various types of oil impregnation, in every case? A. Yes.

10 Q. You never tried one sixteenth of an inch, I observe, with that experiment? A, No.

Q. Was that deliberate or not? A. Well, with no other experiments of any kind had I been able to get one sixteenth of an inch to ignite whatever the source of ignition was -

Q. I follow.

HIS HONOUR: Q. This document has written on it something that looks like "Four inch depth sea water". Was this done with actual sea water?

20 A. Yes.

MR. MEARES: Q. And was it sea water taken from the Mort's Dock area? A. No, but it was genuine 100% seawater.

Q. Taken from the harbour? A. Taken from the harbour.

HIS HONOUR: Q. With all its contamination that we have heard about? A. I would prefer not to comment on that.

30 MR. MEARES: Q. Coming to the next text, Exhibit 1 (10), you made some ignition tests of oily cotton waste with hot metal fragments. This was a test which was done under certain wind conditions, and were those wind conditions again measured? A. Yes.

Q. Were you able to say whether it was in the open, from your recollection or in the laboratory? A. This one was definitely inside the laboratory.

40 Q. You dropped red hot metal - pieces of metal - from heights varying from twelve feet to six feet? A. Yes.

Q. And you dropped them in still air and with a wind of 1.6 miles per hour? A. That is so.

Q. And you dropped them on what? A. Pieces

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Examination
continued

of cotton waste again 20 grams in weight and -

Q. Yes? A. And again saturated with oil.

Q. To the extent described in test 1 (9)?
A. Yes.

Q. Could you tell me what was the depth of the oil in which this test was done, or was it not done in oil at all? I am not suggesting it was? A. No; these were just tests to test the ignition of the cotton waste. The samples of cotton waste were not floating on any oil and water system.

10

Q. Just on some solid base, were they?
A. On solid base, yes.

MR. MEARES: Q. I show you five pieces of metal which formed part of Exhibit 11 - of which Exhibit 11 consisted in the first place. Can you relate any of those pieces to the size of the pieces you dropped, approximately, I mean?
A. That would correspond to the largest of those weights - 62 grams. That would be -

20

Q. You described a piece which seems to be oxidised? A. That is definitely oxidised.

Q. It is an irregular piece that appears to be oxidised? A. Yes; that was a piece that was cut off by an oxy-acetylene torch.

Q. And that would be what? A. 2.3 grams.

Q. Now would you have a look at the smallest - is that cylindrical? A. A small cylinder.

Q. What would that be approximately?
A. That would be about 5.7 grams.

30

Q. The second largest cylinder? A. That would be about 24.5.

Q. And the largest cylinder? A. 40.

Q. And all those metal pieces consist of Exhibit 11 in the other case.

MR. ASH: Might I have Your Honor's permission to have access to them during the adjournment to show an expert of mine?

HIS HONOUR: Yes.

MR. MEARES: Q. So that His Honor may have an idea of the weights of cotton waste, I show you a piece of cotton waste of .6 grams (Handed to witness). Would that be .6 grams? A. Yes.

40

Q. Which is Exhibit 8A. And a piece of cotton waste of 5 grams, which is Exhibit 8B? (Handed to witness) A. Yes.

HIS HONOUR: Q. You used one of 20 grams in some of these tests? A. Yes. May I make a correction? Those samples of cotton waste have been compressed by having been packed in sample containers for some time and there may be a possibility of the larger of those two which I showed you only being 1.6 grams.

MR. MEARES: Q. Yes; I would have thought that by observation of it? A. I beg Your Honor's pardon. I think I was in error there.

Q. Would you have a look at Exhibit 8C, which is marked "20 grams". Would you have a look at a piece of cotton waste which is separated into three pieces, marked "20 grams" and which is Exhibit 8C in the former case? Would you agree that that would be 20 grams? A. I agree that that would be approximately 20 grams.

Q. But in the experiment in which you used it would it have been freer than it is now? A. Yes.

Q. And larger in area? A. Larger in volume, yes.

Q. HIS HONOUR: On Exhibit 1(10), I notice on two occasions out of the total of seven on which you had this light wind of 1.6 miles per hour, you got a smouldering effect and a delayed flame. In every other case you describe it as "In flame on impact?" A. Yes.

Q. Is that because even a light breeze will prevent the flame from catching hold? How would you explain that? A. Well, I think that probably in this case it depends more on the position on the waste on which the metal fell. If it fell on the up wind side naturally it would get more draft than on the down wind side, and one could get somewhat contradictory results using the same amount of waste and the same amount of metal and the same wind.

Q. Well, I ought not to take these tests as indicating that the ignition will take place more rapidly if the air is still - is that right? A. It will not take place more rapidly in still air, yes.

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Examination
continued

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Examination
continued

Q. MR. MEARES: Would you turn now to Exhibit "1 (12)". These were tests as to ignition of oily cotton waste by oxy-welding in still air, and as far as the size of the waste was concerned, was it still 20 grams? A. Still 20 grams.

Q. And was it still impregnated as was the cotton waste described in tests 1 (9) and (10)?
A. Yes.

Q. And the oil thicknesses varied from one eighth to half an inch - is that correct? 10
A. That is correct.

Q. And the height of the drop varied from three feet to ten and a half feet? A. Yes.

Q. And the result in each case was positive?
A. Yes.

HIS HONOUR: Q. In this case you have got your cotton waste on bark, have you? A. No; it is just floating on the layer of oil and water.

HIS HONOUR: Look at the writing on that and interpret it for me. I do not know whether it is yours or not. You may not be able to interpret it. (Document handed to Mr. Meares). 20

MR. MEARES: It is certainly not mine.

HIS HONOUR: Does the witness know what the final word of the handwritten part is?
(Document handed to witness).

MR. MEARES: Q. Is that your writing? A. No, this is not my writing, but it is definitely "20 grams of waste on bark". 30

HIS HONOUR: Q. That is what it looks like?
A. But it does not refer to these experiments.

MR. MEARES: Q. You are quite certain of that?
A. I am quite certain of that.

Q. And you have notes of these tests?
A. Yes; not here. I have notes.

Q. Will you check on that, and if by any means it is incorrect will you undertake to correct it? A. Yes.

Q. But your recollection is that that test did not take place on bark at all? A. That is so. 40

Q. Exhibit No.13 is a test as to the

ignition of dry and oil cotton waste in a wind velocity of 11 miles per hour. The sizes of the cotton waste are from 20 grams to 80 grams, and the first test is with dry cotton waste dropped onto oil, with a wind velocity of 11 miles an hour and ignited by metal slag dropping from an oxy-welding process? A. Yes.

10 Q. Would you tell me what the depth of the oil was? A. That would be - no, I cannot tell you. I will have to check that from my original records.

HIS HONOUR: This is No.13 you are on now?

MR. MEARES: Yes.

HIS HONOUR: According to a handwritten annotation on this it was a quarter inch, but someone ought to check all these annotations because I may be misled. It reads, "One quarter inch layer of oil" - at least I think it reads - "on four inch seawater".

20 MR. MEARES: Yes, we will have those checked.

Q. Summarising that test, it was positive in every case with molten metal dropped on substantially large pieces of cotton waste in water on oil? A. Yes.

Q. Oil on water - I am corrected. Now if you come to Exhibit 1 (14), that is a test, is it not, of the ignition of dry and oily cotton waste, dropping from 13 feet 2 inches above the cotton waste? A. Yes.

30 Q. And was this done without a dish containing oil or oil and water? A. Without oil and water, yes - just on a solid base.

Q. And the wind velocities are mentioned, the sizes of the cotton waste that were used, and it would appear, would it not, generally that the success was better with oily cotton waste than with dry, in that you got ignition more quickly? A. That is so, yes.

40 Q. The ideal wind was what - do the figures tell you there? A. The most favourable winds were from 11 to 17 miles an hour.

Q. Where do you get that from? A. That is not on this document.

Q. Well, on that document the 11 miles an hour

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Examination
continued

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Examination
continued

wind and the 14 miles an hour wind took longer than the four miles an hour wind and the five miles an hour wind with a 40 grams piece of cotton waste - do you see that? I am not trying to knock you over, so to speak, but I just want to point out any strengths and weaknesses?

A. Yes; I see that.

Q. You expressed the opinion that 11 to 17 - ?

HIS HONOUR: I cannot see any consistent result myself, because if you look at the first column you have got 55 for 5.5 miles an hour, as against 8 for 11.5 miles an hour. Then you have 15 and 40 and so on. They are all over the place.

10

MR. MEARES: Yes, That would not seem to establish any theory with regard to what was the best wind velocity.

Q. Did you reach any conclusion in overall tests as to what the best wind velocity was to ignite oil that was on the water in which there was a cotton waste wick? A. Well, I reached a conclusion after I had done a considerable number of these experiments, and the winds which were most successful in causing ignition of the oil varied from eleven miles up to, I think, seventeen.

20

Q. And did you reach a clear conclusion from a large number of tests you did as to that?

A. Yes.

Q. Now what was it - what was the reason for that wind being a successful wind, rather than a heavy wind or a light wind? A. Well, the whole success of ignition of oil by this lighted wick depends on the ability of the lighted wick transferring to the surface of the oil a certain amount of heat in a certain amount of time; in other words, sufficient heat to raise the temperature of the oil so that there will be the right concentration of vapour present at one particular time - a concentration of vapour that will flash and ultimately take fire. If the wind is greater than that - if the rate of the wind is greater than that it does not necessarily mean that the flame from the cotton waste will transfer any more heat to the oil. What it does mean is that it will dissipate more quickly the heat that might be transferred to the oil. In other words, the chances of raising the temperature of the oil are lowered, and, at the opposite end of the scale, where one has a very low

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velocity of wind, then the heat from the wick will go straight up. We know how a flame rises in still air - there will be a current of air coming in over the surface of the oil and upwards, and that current of air will tend to cool the surface of the oil rather than allow this wick flame to heat it up. In other words, the surface of the oil will not reach the flashpoint temperature.

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Examination
continued

10 MR. MEARES: I think that Your Honor will observe from an Exhibit - I think the Exhibit is in - that the wind velocity at 2 p.m. on the 1st November was 10 miles an hour at one o'clock, and at 3 o'clock it was 11 miles an hour. Of course that was at the Sydney Weather Bureau.

HIS HONOUR: And on this document there was a change of wind at somewhere about 11 o'clock, and a bigger wind, which is given as 9, at 12 noon. Is that right?

20 MR. MEARES: Yes.

HIS HONOUR: And then 11, 10, 10.

MR. MEARES: Yes.

(Luncheon adjournment).

AT 2 p.m.

30 MR. MEARES: Q. I was wondering whether, during the adjournment, you have been able to check from the original records you made of these tests which were conducted some six years ago, as to whether or not certain annotations in ink appearing on the tests are correct or otherwise?

A. They are quite correct. The series of results are perfectly correct and corresponding with the notes in my original notebook and with the original script.

40 Q. Would you go through the annotations? First of all, there is no annotation on Exhibit 1(5). On Exhibit 1(6), which was tests of burning hesian, there is an annotation that that was done - I am sorry; it was stated that it was done in still and open air, but the annotation states that in the open air there was a wind velocity of 7 miles per hour - is that correct?

A. That is correct.

Q. And again in Exhibit 1 (7), which is a test

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Examination
continued

of burning cotton waste in open air, the wind velocity in the open air was 7 miles per hour?
A. That is correct.

Q. And in Exhibit 1 (9), which was an ignition by smouldering oil cotton waste, there is typed in the wind velocity there, but it was done on top of oil on four inch depth of seawater?
A. That is correct.

Q. And in Exhibit 1 (10) tests of ignition of oily cotton waste with hot fragments, the waste was 20 grams in measurement, that was used?
A. That is correct.

10

Q. The one that his Honour particularly asked you about was Exhibit 1 (12), in which you were asked whether the waste was on bark when the tests were done, as appears from the note, and your recollection is that it was not on bark. Was your recollection incorrect? A. My recollection was incorrect. It was done on bark.

Q. And in Exhibit 1 (13), which is ignition of dry and oily cotton waste by oxy cutting in a wind of 11 miles an hour - those tests were done with oil a quarter of an inch thick lying on seawater, four inches thick?
A. That is correct.

20

Q. And in Exhibit 1 (15), when you tried to ignite dry cotton waste, dropping from a height of 30 feet six inches with a wind velocity of 1.6 miles per hour, that was done by means of using an electric arc welder? A. That is correct.

30

Q. And the same means were used in the final test, Exhibit 1 (16), when you attempted to ignite oily cotton waste with the same wind velocity, dropping from the same height - is that correct? A. Yes, that is correct.

Q. Could you recall what test we were dealing with before the luncheon adjournment? A. I think we had just started to consider this Exhibit 1 (13), the ignition of dry and oily cotton waste by oxy cutting in a wind velocity of 11 miles per hour.

40

Q. And those tests were done both with an electric welder and oxy-acetylene cutting machine? A. Yes.

Q. And using either apparatus and cotton waste of the size of from 20 to 80 grams, either dry or oily, from distances of either three feet or nine feet, both the waste and the oil ignited in each case? A. Yes.

Q. And that test, of course, was done without any oil on water? A. No.

Q. I am sorry. It was done with oil on water?
A. A quarter of an inch layer of oil on four
10 inches of sea water.

Q. If you turn to Exhibit 1(14), that was a test as to ignition of dry and oily cotton waste by molten metal or slag or sparks either from an oxy welder or from an oxy cutter, conducted 13 feet 2 inches above both dry and oily cotton waste - is that correct? A. That is correct.

Q. And it was done in winds varying from 4.7 to 14 miles per hour - is that so? A. That is so.

20 Q. And with varying sizes of waste, of 20 grams, 40 grams and 80 grams? A. That is so.

Q. And at 5.5 miles per hour you got a positive result in regard to waste of 20 grams and 40 grams, either dry or oily? A. that is so.

Q. And you got a similar result with wind of a velocity of 11.5 miles an hour, and with a wind of fourteen miles an hour testing only a 40 gram piece you got a positive result with both dry and oily waste? A. That is so.

30 Q. If you would now turn to Exhibit 1 (15), that is a test of ignition of dry cotton waste dropping on metal - I am sorry, dry cotton waste, produced by dropping of metal from a height of 30 feet 6 inches, with a wind velocity of 1.6 miles per hour, with a large piece of waste with an approximate diameter of 7 and a quarter inches - is that correct? A. That is so, yes.

40 Q. And in that test with 20 grams you did not ignite the dry cotton waste in 180 seconds, and did you then discontinue that operation?
A. Yes, that particular test.

Q. Did you discontinue because you thought the chances of igniting had disappeared?
A. That is so.

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Examination
continued

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Examination
continued

Q. But with the other cotton waste of 40 grams, teased out to that area, if I can use that expression - a diameter of 7 and a quarter inches - you got positive results in a mild wind of smouldering - three cases of smouldering and then in flame? A. That is correct.

Q. And in the column, "time to ignite" - is that the time of smouldering or the time of lighting up? A. The time ignite was the time from which the welder was started until the waste either smouldered - it smouldered first in each case. It was timed from when the welder was started until the waste was seen to smoulder.

10

Q. If you take the further examples in that test, of cotton waste of 40 grams, in some cases in the test there is simply the word "smouldered"; then in others "smouldered" and "in flame". I take it where you have "smouldered" you never got any flame? A. That is correct.

Q. So that of the tests done from that height with a large piece of dry cotton waste - of twelve tests you only got fire in four? A. Three.

20

Q. Would you have a look at "40 grams, 12 seconds"? A. Oh, I beg your pardon - yes, four.

Q. Then in Exhibit 1 (16) appear particulars of a test of the ignition of dry cotton waste. I withdraw that question. Would you tell me what that test is? A. That is the ignition of oily cotton waste.

30

Q. Well, you have here in the heading, "Ignitions of dry cotton waste," "wind", and then "ignition of oily cotton waste" - is that quite accurate? A. Is that Exhibit 1(16)?

Q. Yes. It is a misprint in the appeal book. The Exhibit is as you say it is.

HIS HONOUR: I had better have a look at 1 (16).

MR. MEARES: I show Your Honour the two documents. (Documents handed to His Honour).

HIS HONOUR: Where do you say there is the difference? 40

MR. MEARES: There is the addition in the Privy Council book which says something about the ignition of dry cotton waste, wind velocity; and then it says "ignition of oily cotton waste," and Mr. Parker says that it was a test of oily cotton waste.

MR. ASH: We will cross out the first line?

MR. MEARES: Yes.

HIS HONOUR: Yes.

MR. MEARES: Q. As far as that test was concerned, you used a similar sized piece of cotton waste as in -? A. That is so.

Q. Exhibit 1 (15), except that I think there was a quarter of an inch difference? A. Yes.

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Examination
continued

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Q. And with cotton waste impregnated with oil, and with a wind velocity of 1.6 miles, you achieved in every case the igniting of the cotton waste, whereas with dry cotton waste you only achieved a one third positive result? A. That is quite correct.

Q. You have, I think, given a substantial amount of consideration to the risk of fire from fuel oil of this sort contained, if I can use that expression, as it was on the day in question? A. I have.

20

Q. Bearing in mind the results of your tests and your consideration of the problem, in your opinion what factor or factors, either alone or in combination, were necessary to exist before this fire could have happened? A. Well, I think quite undoubtedly a combination of factors was necessary for this fire to have been possible. Firstly, with regard to the oil, it is necessary that the layer of oil - the thickness of oil - should be more than one sixteenth of an inch thick. Secondly there must be, in contact with that oil, some source of heat - preferably a wick - which is capable of supplying to the oil sufficient heat to vaporise enough of it to form a combustible mixture of air and vapour. There must be another influence in that although we may have a wick which is alight and producing a sufficient quantity of heat to bring about this end, the flame in that wick may not be close enough to the surface of the oil to bring about this end. In other words, another factor is necessary - a factor to bring that flame in contact with the surface of the oil, and that is wind. Now, naturally in an open space winds of all velocities are possible. When I say "all velocities" - a very great range of wind velocity is possible, and we must consider whether these conditions will be fulfilled by wind velocities of all amounts, and it is my very considered

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Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Examination
continued

opinion, from the work I have done on this problem, that a wind which will bring about the ignition of this oil is a wind with very definite limits - a higher and a lower limit - of velocity. We have this combination of factors which must be in existence, and in addition, of course, a set of factors might be in operation - we could have the wick, we could have the wind - I said that we could have the wick, and incidentally the wick must be saturated at the surface of the oil - that is another condition, and then, finally, in a natural condition such as that we must have some agent which brings about the ignition of the wick itself first. In other words, we have to have a large number of conditions present before the oil can be ignited. Is that sufficient?

10

Q. Yes. I would like to ask you one further question, if I may. You said that the wind must be within limits, and you have spoken of a wind of 11 to 17 miles an hour? A. That is so.

20

Q. Now one observes from your tests - and I seek an explanation from you of this - that sometimes you achieved successful results with lower velocity winds than that? A. That is correct, yes. Why?

Q. Yes. A. Those were usually with the larger wicks - those successes with the lower wind velocity - in other words a larger heat source - and usually those larger wicks were more irregular around the edges and one must take this factor into consideration that where you have a burning mass with an irregular surface there will be minute little bays in the periphery of that wick into which a small portion of oil will move by capillarity - it will be surrounded by burning cotton waste and consequently it receives enough heat to raise it to its fire point and so burns, and that, I think, is the explanation of why one gets ignition sometimes with low velocity winds.

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Cross-
examination

CROSS-EXAMINATION

MR. ASH: Q. Just a few isolated points before we come to these tests. You said that coal is not a classified hydro-carbon - pure - is that right? Is that what you said? A. That is what I maintain, yes.

Q. I am referring you to the Encyclopaedia Britannica? A. Yes.

Q. You would agree with me, would you not, that coal contains hydrogen and carbon?

A. I would agree with that, yes.

Q. You would? A. I would.

Q. And that from coal you get gas and coal tar?

A. That is correct.

Q. And are they hydro-carbon products?

10 A. Some of the gas is and some of the other products are hydro-carbons, but not all of them.

Q. Well, if they come from coal, the hydro-carbons must have been in the coal first, naturally, mustn't they? A. Not necessarily. No - I am sorry.

Q. It comes in the process of oxidation?

A. I beg your pardon?

Q. It comes in the process of getting the product, does it? A. In the distillation, yes.

20 Q. It comes from outside? A. No; it does not come from outside.

Q. It comes from the coal? A. It comes from the coal.

MR. MEARES: If my friend has a scientific book which says that coal is called a hydro-carbon, I do not mind him producing that.

30 MR. ASH: Q. You spoke of these atoms. Am I right, from my school knowledge, that atoms are not usually separated singly except by this comparatively new process. Molecules are the things which make a substance up, are they not? A. Yes.

Q. And you have got a lot of molecules that contain both hydrogen and carbon atoms, and you have them in coal? A. Wait a bit - I have them in coal, have I?

Q. Well, have you? A. There is carbon and hydrogen in coal -

40 Q. There is no compound of them in coal - is that right? A. Not the compounds we get by distillation.

Q. Are there any compounds of hydrogen and

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Cross-
examination
continued

carbon in coal? A. Not essentially. If you are going to split hairs like this, no, not essentially, because they would also have oxygen.

Q. You would have no C_2H_2 or CH_4 ?

A. No. If you wish to be technical, you have the degradation products of cellulose.

Q. The classifications into various fuels are not always the same in the terminology of different experts, are they? A. Not entirely the same.

Q. And coal at all events - coal tar as I am reminded - is that a hydro-carbon fuel? A. You cannot class coal tar as a hydro-carbon, as there are so many hundreds of substances contained in it. 10

Q. But all fuels have hydro-carbon in them, do they not? A. All fuels?

Q. Yes, all fuel oils? A. Yes, but wait a bit - coal tar is not strictly a fuel oil.

Q. Would you agree with this statement that coal tar is a viscous liquid composed largely of aromatic hydro-carbons? A. Yes, largely - I will agree with that. 20

Q. The whole thing is a matter of degree, is it not - about how many atoms of hydro-carbons are in the thing? A. Yes, but there is no coal tar in coal.

Q. Because the coal tar is obtained partly out of coal and partly out of the distillation process? A. No.

Q. Well, it is not connected with coal, is it? A. It comes from coal. 30

Q. All right. I want to deal with another matter entirely. You were talking about oil on the open water and oil not on the open water - do you remember? A. Yes.

Q. Lying on water, but not in the open sea - do you follow me? You were giving some views on the two situations? A. Well, if it is not on the open sea, where is it?

Q. Look - Mr. Parker - ? A. I have to give answers as exact as possible. 40

Q. I will just read you my note. Oil on the open harbour and oil on the wharf with no complicated conditions? A. Under a wharf.

Q. I beg you pardon, under a wharf - on the water and under a wharf? A. Yes.

Q. Am I right in saying that there is a large difference between the condition of oil on an unlimited expanse of water, just spilled there, and oil lying on water in a closed tin?

A. You mean a tin completely closed?

Q. Yes. A. Yes.

10 Q. And the one is less combustible than the other, is it not? A. Well, which one is less combustible?

Q. I am asking you is one less combustible than the other? A. Yes.

Q. And the one that is less combustible is the one which is on the open water? A. No.

MR. MEARES: Q. You have the lid on the tin?

A. You have the lid on the tin. You have a closed tin. I am sorry - I am not trying to evade your questions.

20 MR. ASH: Q. The amount of air that mixes with the vapours of the oil in the tin is not important, is it? A. Well, it is not sufficient to cause any great combustion.

Q. But is oil in a closed container - say half oil and half air - is that more combustible than oil on the open water without any enclosure?

A. Well, if the oil on the open water is thick enough to burn -

30 Q. Take oil of uniform thickness in each case? A. Look, I am terribly sorry. In a tin you could have a layer four or five inches deep, of oil. If you put oil on the open sea and allow it to spread freely, you are going to get one sixteenth of an inch.

Q. Take oil on the open sea of thickness X. Do you follow me - not spreading? Say that there are booms round it just sufficient to stop spreading -? A. Right.

40 Q. But not sufficient to affect the amount of air coming on to it. Do you follow me now? A. Yes.

Q. Now take oil of thickness X in an enclosed tin - is there any difference between the combustibility of those two oils? A. I should say "No".

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

Q. If you had oil in a tin or tank, half filled, with the lid off the tank, and you compared that with the oil on open water with a boom round it of the same thickness - would there be any difference in the combustibility of those?
A. No.

Q. All right. Does any vapour ever come off oil?
A. Off fuel oil?

Q. Off fuel oil?
A. Or oil that we are considering?

Q. Yes.
A. If it is heated.

Q. As it lies in ordinary temperature does any vapour come off it?
A. Comparatively speaking, an almost infinitesimal amount, yes.

Q. It comes off on fractional distillation, does it not?
A. Yes.

Q. You can smell it, can you not?
A. When you are distilling it?

Q. You can smell the vapours if it is not freely removed away by the atmosphere, can you not?
A. Yes, you can.

Q. So that you will agree with me that when oil ignites it is the vapour that ignites and not the liquid?
A. That is so.

Q. So that if you have some vapours, however small, lying on oil, and you have an igniting agent, it is more likely to catch fire than if there are no vapours?
A. No, not unless there was a certain amount.

Q. What conditions would cause the certain amount?
A. Increase in temperature.

Q. It would not make any difference how much the oil is confined - to the production of vapour - is that what you say?
A. No; that is correct. It would not make any difference.

Q. No difference at all?
A. It would make no difference to the production of vapour I say that.

Q. Confinement would not make any difference to the production of vapour, but the confinement would make a difference to the dispersal of vapour. Does that sum it up?
A. That sums it up better, yes.

Q. And of course, the amount of dispersal

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would - other things being equal - depend upon the degree of confinement? That follows, does it not? A. Again I apologise. What do you mean by the degree of confinement - a tin with a small hole in the top as against a tin with a large hole?

10 Q. And varying degrees - of a very large wide tin with the oil near the top - a very tall narrow tin with the oil near the bottom - one can imagine an infinite number of possibilities. I am putting the general proposition to you? A. It will tend to build up in all cases to a maximum figure, but I do admit that in the container which is more closed there will be at any time a higher concentration of vapour.

20 Q. Now I want to get on to another matter. The words "combustible" and "Inflammable" of course are pretty wide, each of them, in their meaning, are they not? A. Yes.

Q. I mean that in ordinary parlance "combustible" means, if I may be so trite, something which will combust or burn? A. That is so, yes.

Q. And in ordinary parlance, "inflammable" is something which is readily ignitable? A. That is so.

Q. And also relating to the concept of inflammability is the speed and intensity of the burning once ignited, is not that so? A. Yes.

30 Q. You went through an index, you told my learned friend? A. I did.

Q. And I have just forgotten what years it covered? A. 1944 to 1949 inclusive.

Q. I beg your pardon - inclusive? A. Yes.

Q. You did not come across this entry, did you, in the index, "oil, water surface -" I beg your pardon. I will give it to you exactly - "Oil, water surface, fire hazard"? Did you come across that? A. Oil, water surface or service -?

Q. Surface? A. Surface.

40 Q. Yes - fire hazard. To give you the full picture - in the 1948 volume? A. Yes; I think I do remember something of that.

Q. Do you? A. Yes.

Q. You did not tell us about that this morning,

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

did you? A. No. I was referring to fires of oil on water this morning.

Q. Not to the fire hazard of oil on water - is that what you say? A. I am saying that I saw one entry in the index referring to a fire on water.

Q. I ask you again, you did not then advert to any entries relating to any allied subject matter unless you saw that there was an article on the account of a fire happening - is that right?

A. I did look for fires in connection with fuel oil and furnace oil.

Q. Did you say you saw this article heading, "Oil, water surface, fire hazard" - you saw that?
A. To the best of my memory, I did.

Q. You agree that the whole of this case is about oil on a water surface and fire hazard - this whole case you know is about that? A. Yes.

Q. And did you look at that article? A. No.

Q. I suppose you would agree, on a little reflection, that it could have been material to the matter? A. It could have been.

Q. Indeed, if one may sum it up, it would be an article right on point? It gives that appearance by its title? A. Not altogether..

Q. Well, almost dead on point - almost?
A. Well, that is what you maintain.

Q. And it would have been particularly important, would it not, if it was in 1948, to this inquiry? A. It would have been relevant, yes.

Q. But you do not know whether it is relevant or not until you look at it, do you?
A. Until I look at it.

Q. You would agree, without me going into it, that there are a number of articles in that index relating to fuel oil and the fire hazards relating to fuel oil - would you agree with that?
A. I did not see any actually indexed under the term "fuel Oil".

Q. I am speaking, in fairness to you, of the index? A. Yes, I know. I did not see any articles headed "fuel Oil".

Q. You did not see, for instance, one headed "oil fuel storage, fire precautions"? Did you

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see anything like that? A. I did see that -

Q. You did? A. I did see that, yes, but -

Q. If I put it to you that that also came from the 1948 edition, that has something to do with the matters in this case? A. It could do.

10 Q. And without worrying about the article, it would, to your mind as a scientist, prove, that whoever were the compilers of this index - and we are only talking about the index - whoever the compilers of the index were they at least had some knowledge of an article - articles - relating to oil fuel storage, fire precautions, three years before this subject fire - would you agree with that? A. Well, everybody knows that oil will burn.

Q. Well, while you are on that, anybody would know that and know for a long time, provided it is ignited - you would not dispute that fact? A. No, I would not dispute that oil will burn.

20 Q. And furnace oil? A. I agree that furnace oil will burn.

Q. And that has been known for decades, if not much longer, has it not? A. I agree with that.

Q. And that it would burn, as I think you indicated in answer this morning - it would burn on a hard substance, on water or anywhere? A. No; I would not agree that that knowledge was known.

30 Q. You would not suggest for a moment that the phenomenon of oil burning on water was known to people for the first time after 1951? You would not go that far would you? A. No; I am sorry.

Q. You would not? A. No.

Q. It was known, was it not, that oil could burn on water long before 1951, was it not? A. Yes.

40 Q. Just before I leave it, and I am only referring to one year in the index - 1948 - did you direct your mind to an article "Fire Prevention Precautions for Oil Storage Installations"? A. No.

Q. Indexed under "Fuel Oil Storage"? A. No.

Q. You missed that one? A. I missed that one.

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Cross-
examination
continued

Q. Had you heard of the "Panamanian" fire at all?

MR. MEARES: When?

MR. ASH: Q. At all? A. At all?

Q. At all? A. It was mentioned to me some years ago.

Q. Some years ago - when? A. When the question of this "Waggon Mound" case first came up.

Q. When you were first asked to participate in some tests and that sort of thing, with Professor Hunter? A. Yes. 10

Q. Had you ever heard of the "Eden Dale" fire? A. No.

Q. You had not heard of that? A. No.

Q. Were you in Court yesterday when Captain Murcheson was giving evidence? A. No.

Q. Had you heard of any fires on Sydney Harbour - water fires? I do not mean water fires, I mean oil on water fires?

HIS HONOUR: Fires on the Harbour as distinct from being on shore installations - is that what you are asking? 20

MR. ASH: Yes.

WITNESS: I cannot recall any at the moment.

Q. MR. ASH: Well, it would be fair to say that you would have known, long before 1951, that fires of small and larger size - perhaps not a conflagration - had occurred on Sydney Harbour? A. No, not necessarily.

Q. No knowledge at all of oil burning at all on Sydney Harbour? A. No. 30

Q. Are you sure? A. As far as I can remember, no, I cannot think of any.

Q. After all, I suppose you are primarily a chemist, are you not? A. Yes.

Q. And you primarily work in the laboratory?, the lecture room, do you not? A. Yes.

Q. Did you happen to notice this one in the same year - 1944 to 1947 - "Oil, Bunker, Fire Precautions" - 1944 to 1947 volume? A. What section of the index is that in? 40

Q. "Oil" ? "Fire Fighting Organisations"
A. No.

Q. You did not look at that? A. No.

Q. What section did you look at? A. I looked at sections A and B.

Q. Would you recall the headings of those off hand? A. One I can recall -

Q. Perhaps I can assist you. Would one be "Occurrence of Fire"?

10 HIS HONOUR: Occurrence of Fire?

MR. ASH: Q. "Occurrence of Fire"? A. No. Just a heading like that?

Q. It was a heading like that? A. I say, was it a heading like that?

Q. You had a look at all these indexes?
A. A very quick look.

Q. A quick look? A. Yes.

20 Q. Do you say that - through these eleven volumes or more - is that what you say? A. Yes, eleven volumes. I got through those two sections, I think it was, about 4¼ hours altogether.

Q. Did you? A. Yes.

Q. How many sections are in each volume? A. I think it is A to G.

Q. And were the headings uniform throughout each volume? A. Yes.

Q. And you limited yourself to two in each volume? A. I was looking particularly for descriptions of fires.

30 Q. I follow that, and you stated a moment ago that you limited yourself within that A to G, to two headings in each volume? A. Yes.

Q. Can you recall the headings that you looked at?

HIS HONOUR: Section headings?

MR. ASH: Q. Yes, section headings. There are seven of them? A. I think so A. was "Fire, Occurrence, Material Damage, Loss".

40 Q. If I put to you the initial words of that heading, "Occurrence of Fire Incidents," with

Defendants
Evidence

No. 25

H.H.S. Parker

14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

reference to material loss and damage following
that -? A. Yes.

Q. That would be one of the headings? A.Yes.

Q. What would be the other? A. Either
"Hazards in Fires" or "Fire Hazards", s.B.

Q. So that you would not have had a look at
"Fire Precautions" if that was a separate heading?
Assuming that there was a heading "Fire Hazards",
one heading, and "Fire Precautions", another
heading, you would have looked at "Fire Hazards"
and not "Fire Precautions"? A..Yes.. 10

Q. "Fire Fighting" would be another that you
looked at? A. Yes. It was in the index.

Q. I have forgotten the precise words that you
used this morning, but as I understood you, you
said - I am on to cotton waste - you said that
cotton waste would float on oily water for vary-
ing periods before it sank? Is that what you
said? A. Yes.

Q. And the periods went up to some number of
hours? A. Yes. 20

Q. How many hours did you say? A. I think I
said "12 hours".

Q. Twelve hours? A. Yes.

Q. Was that the longest? A. That it would
float?

Q. Yes. A. That was the longest that I have
record of.

Q. And was that conducted with varying sizes
and weights of cotton waste material? A. Yes. 30

Q. Ranging between what - in grams, say?
A. .6, 5, 20, 40, 80.

Q. When did you do those tests in that regard?
A. Those were started round about May 1956.

Q. In 1956? A. Yes.

Q. With Professor Hunter? A. Yes.

HIS HONOUR: Q. When you mentioned "12 hours" a
moment ago, did that refer to cotton waste which
was dry when it was put on the water? A. It
referred sometimes to dry waste and sometimes to
waste that had been saturated with oil. 40

Q. I have a note that you said earlier in your

evidence, "If the oil is soaked or ready when it is put on the water," the longest time you had was three hours forty minutes? A. That was with very small pieces.

Q. You did have some longer times with larger pieces? A. Yes. That was in the 1956 series. I have had some longer tests.

10 MR. ASH. Q. Would you like to refer to some document you have in Court about the tests you made in 1956, or do you feel that you have sufficient recollection if not to be precise but a pretty broad recollection of the results?
A. A broad recollection - I have a reasonably reliable recollection of the trend of the results.

Q. And the trend, you say, was that the maximum you got was about 12 hours floating and that would be with one of the larger bits of cotton waste? A. Yes.

20 Q. Probably, in the light of what you said, one of the 80 gram pieces - is that right? A. Yes, that is correct.

Q. And what thickness of oil do you recall was used for these tests, or what range of thicknesses? A. One sixteenth to one quarter.

Q. Was there any material difference between the time the cotton waste remained on the surface, as between the eighth and the sixteenth thickness? A. Yes.

30 Q. Did it remain longer in the case of the eighth in general than in the case of the sixteenth? A. Yes.

Q. And longer on the quarter than on the eighth? A. Yes.

Q. And all this oil I take it that you had on water was of the order of 170 flashpoint?
A. It was 170.

40 (At this stage His Honour stated that at p.312 of the transcript Mr.Parsons was speaking of some oil which he said he had got from the Vacuum Oil Company and which he had seen tested for its flashpoint. His Honor further stated that the transcript says that the oil was 160 flashpoint but he was certain that the witness had said 166 flashpoint. Counsel agreed that that was correct.)

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963
Cross-
examination
continued

Q. You were engaged in tests, I take it, in connection with this matter, for the Mort's Dock case? A. That is so.

Q. And before and during the hearing of the case you had tests? A. Yes.

Q. Were you present at a test when this happened - a one eighth of an inch layer of 170 flashpoint furnace oil was on sea water and a 20 gram bundle of cotton waste was on that. Were you present at any such test that you can recall? A. Yes.

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Q. And I think you would agree with me, would you not, that when cotton waste is placed on an oily surface it is preferentially wetted by the oil? A. No; I cannot agree with that unconditionally.

Q. I beg you pardon? A. I cannot agree with that unconditionally.

Q. Well, let us take it step by step. Does it happen more often than not? A. I do not know that.

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Q. You do not? A. No.

Q. Do you know - are you able to give any idea at all of the extent to which it would become preferentially wetted by oil? A. Well, in most of the cases - I say "Most of the cases which I have observed" - ultimately, although the oil may preferentially wet the cotton waste, ultimately the oil is displaced by water.

Q. Does it do it gradually? Yes.

30

Q. If you postulate X hours of floating of the cotton waste, the oil would start to give way to water when - halfway through or three quarters of the way through that time lapse? A. No; I think earlier.

Q. You think earlier? A. I think earlier, yes.

Q. And it would be progressive until the water took charge - is that right? A. Until a very substantial percentage of the cotton waste was wet with water.

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Q. As against oil? A. As against oil.

Q. You said you were present at that test a moment ago, on those precise facts - do you recall this happening, that the cotton waste sucked up oil from the layer of oil, the bottom

part of the cotton waste penetrated the oil there and went into the water, but had been completely coated with the oil and did not pick up any water at all; but remained completely dry in respect of water, sucked up more oil, and it was left floating for a period of 14 hours and still contained only oil and no water. Do you recall that happening? A. I do not recall that particular incident. I am quite prepared to admit that, though.

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Q. That expands, of course, your generality a bit, does it not, because one datum there was 20 grams of cotton waste? A. Yes.

Q. Whereas you had expressed the opinion earlier to me that by and large it was the 80 gram bits that saw the longer distance, not the 20 gram bits - is that right? A. That is so.

Q. And then again 14 hours is longer than 12? A. That is so.

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Q. And then again, at the end of that two hour period, up to 14 hours, there is no indication at all of any water getting back into the oil-soaked cotton waste, is there? A. In that particular experiment. You said that I agreed with this conditionally - this first theorem that you put up, and I did.

Q. Would you just repeat what you said then? A. I said that I agreed conditionally with that first theorem that you put up, that oil would wet cotton waste in preference to water.

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Q. Well, if that test that I read out to you were a criterion, it would rather suggest that the oil would monopolise the cotton waste for a long long period, would it not? A. In that particular test, yes.

MR. MEARES: What page are you reading from?

MR. ASH: Pages 446 to 447.

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Q. That test which we have been discussing, do you say that that was not a normal test - a normal result, I mean? A. No, I would not say that.

Q. You would say then that it was quite a normal result? A. It is no more normal than for the waste to be wet by water, because both will happen.

Q. Wait a moment. It is not as simple as that.

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

You say that it is no more normal than the waste to be wet by water, but do you say first of all that that type of result would flow in 50% of cases? A. I cannot answer that. You have to know the conditions of the surface of the cotton waste.

Q. I am putting to you your recollection of tests that you performed or were present at?

A. Now you are asking me the proportion of tests - in the proportion of tests which I did - ?

10

Q. Yes. A. Did water wet cotton waste preferentially to oil - more than the other?

Q. Vice versa, yes. Can you give me some rough figure or percentage? A. I cannot give you an actual percentage. I can give you an answer to that one, though and that is that certain pieces of cotton waste, as you have described there, would become wet preferentially with oil. Quite a number of others would just as easily become wet preferentially with water.

20

Q. Why? A. Why?

Q. Why the difference? A. Well, I think one difference - you see, one has got to take into consideration here the height from which the waste is dropped on to the surface of the oil.

Q. I am suggesting in this test - you may have forgotten that the initial words that I read out were that the cotton waste of this test was placed on the oil surface? A. Yes; I know, but I am endeavouring to give a description of the general position, and this question depends on, if you like, how the cotton waste was placed on the water - on the surface of the oil. If you dropped it from a comparatively great height you have the chance of the cotton waste penetrating the surface of the oil very quickly and coming in contact with water.

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Q. Perhaps we are getting a little away from it. You were telling me about the position of cotton waste that had soaked up oil and then, at some stage less than half way through its floating life, the water started inexorably to overtake the oil, and when it got to a sufficient winning margin the piece would sink? A. Yes.

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Q. That is the position you gave me? A. Yes.

Q. In that situation it does not matter how the cotton waste arrived at first? A. Yes, it does.

Q. Well then, if that is the case, we have the position that this possibly could happen, and it may be so, that the cotton waste could sink through the film of oil, absorb a substantial quantity of water, rise, stay oiled for some time, and then the water would start to take over again? Is that position possible? A. Well, I think once -

Q. Perhaps I might ask you the question first. Is that position possible? A. That it gets wet with water, and then wet with oil, and then ultimately wet with water? A. Yes; temporarily gets some water on it and rises, and then all the water is pushed out by oil and the oil impregnates it for a certain time, and then the water starts to take over again and pushes the oil out? A. No; I do not think that that is possible. Once the water has taken over the oil will not displace the water.

Q. I am directing your mind to the overtaking of the oil by the water - do you follow? I postulate, at some stage of the floating period, the cotton waste with oil on it preferentially wetted - do you see? A. Yes.

Q. And do you seriously say that water can overtake that position and defeat it? A. Yes.

Q. You will agree that in these 14 hours of the test I quoted, the reverse happened? A. Yes.

Q. You will agree that that is so? A. Yes.

Q. All I am asking is, which is the normal position - at some stage we have got waste with oil in it? A. Yes.

Q. Now which is the more normal position - for it to remain preferentially wetted by oil, or at some stage for the water to overtake the oil? A. I am afraid I cannot answer that.

Q. Well, you did the tests I am asking you about? A. Yes, and when I started to describe the tests and get some conditions, you would not let me.

Q. I beg you pardon? A. When I started to state some conditions which I thought the matter

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

demanded, you asked for a Yes or No answer.

Q. Please take your time and answer the question. What are the conditions? A. You are saying that if a mass of waste becomes impregnated with oil?

Q. Floating on water? Floating on water - that the water cannot displace the oil?

Q. So far I have only suggested that this one test tended to prove that the water remained there to the exclusion of oil - subject to that you are right? A. May I state conditions which will explain that? 10

Q. Yes, do? A. And I am sorry that I must bring in this question of how the waste arrived on the water.

Q. Is that relevant? A. I think it is very relevant.

Q. Well, what is the next condition? A. You mean, what is the next condition which will allow -? 20

Q. Water to overtake the oil? A. Water to overtake the oil?

Q. Yes? A. The coating of the oil on the outside of the waste is not complete.

MR. ASH: Q. I follow you. The second condition was - A. That the coating of furnace oil -

Q. - was not complete. There is another one? A. I think that is sufficient.

Q. That is all you wish to advance as relevant? A. Yes. 30

HIS HONOUR: Q. Getting back to your first condition, is it a condition of the oil remaining and not being displaced by water that it should have been placed gently on the water, as distinct from being dropped from a height? Is that one of the conditions? A. Yes.

MR. ASH: Q. And the second one is, as you say, when it first arrives it should not be fully coated with oil.

HIS HONOUR: No. His second condition would be, I think, that it was fully coated with oil. We are discussing now the one which remained impregnated with oil and which was not displaced by the water, are we not? 40

WITNESS: Let us discuss that.

HIS HONOUR: Q. First of all, you have it gently placed on the water and secondly, you have it fully coated with oil. Is that right?

A. Yes.

MR. ASH: Q. Anyhow, depending on how those two factors operated, so would the result be of the sinking? A. If the waste were not completely coated with oil to start off with, furnace oil, then it will almost certainly sink in time.

10

Q. Does the cotton waste, when on the water, keep on absorbing oil, or does it get saturated? Do you know the answer to that? A. Just a minute. If the coverage of oil is complete, around the mass of cotton waste, it may continue to absorb oil.

Q. Indeed, I put to you that it probably will, A. That it will under those conditions?

Q. Yes. Do you agree with that? A. Yes.

20

Q. And that that would be so even if it had some water on it, when it first reached the surface? A. We are confining our argument to furnace oil?

Q. Yes. A. If it had some water on it before it hit the oil would the conditions be the same, would it continue to absorb oil until it was completely saturated?

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Q. Yes. If it had some water, and some part not filled by water. I put it to you it would absorb oil, which would push out the water. A. In many cases, many experiments I did, the opposite was the case. The oil was displaced.

Q. And in many, the water was displaced. Is that right? A. No, not water displaced by furnace oil. I never said that.

Q. Not in any experiment? A. I say that, yes.

Q. In no experiment? A. To the best of my memory.

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Q. I am taking a piece of cotton waste just partially soaked with water and not wholly? A. Yes.

Q. The oil would never push out the water, preferentially wet? A. You would have to have

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Cross-
examination
continued

a lot of bits of cotton waste to test that, of exactly the same surface characteristics.

Q. If a scientist came into this box and said that a piece of cotton waste was held down manually at the bottom of a tank or tin full of water, except for a coating of oil on its top, and it was held down there for two or three minutes and then was brought up to float on the surface, and that all the water was preferentially expelled - if I could call it that - by the oil - A. That seems a fairly definite case. 10

Q. Would you say that that was impossible?
A. How does it get to the bottom of the tank, pushed down through the oil?

Q. Get the cotton waste in your hand, with a bit of wire around it, push it down through the oil and leave it at the bottom two or three minutes. A. Yes.

Q. Sufficient, I presume, to get it pretty well soaked in water. A. Yes. 20

Q. And released it, so that it floated on the oil surface, on the same water, then the oil takes charge and gradually pushes out the water.
A. That is what you are maintaining? ...

Q. Yes. If a scientist said that, you would disbelieve him, I take it? A. Well, I would disbelieve him if he said it happened on every occasion.

Q. Well, it can happen on some occasions?
A. It can happen on some occasions. 30

HIS HONOUR: Q. Would it probably happen or probably not happen, or can't you say? A. I cannot answer.

MR. ASH; Q. As regards placing cotton waste on the oily surface, in the first place would it make any difference whether it was, at the moment of reaching it, oily or not oily?
A. Oily with furnace oil or with some other type of oil? 40

Q. Say furnace oil? A. How do you mean would it make any difference - to the absorption?

Q. How long it would stay there or whether it would preferentially absorb water? A. If it were wet with furnace oil it would sink more rapidly.

Q. It would make a difference? A. It would make it sink more rapidly.

Q. What about other types of oil? Would the same general position, with degrees, apply?

A. Yes, I think so. When I say it would make it sink more rapidly, it would sink more rapidly than a dry waste.

10 Q. You say you were present at these tests. Were you present at that time earlier, at a number of tests on that matter? A. Yes.

Q. Do you recall a number of other tests where 20 grammes of cotton waste were taken and wetted previously with 20 grammes of oil? Do you recall tests like that? A. Yes.

Q. And that the same result occurred, that is to say, stayed on the water, absorbing oil, at least up to 14 hours? Would you agree with that? A. Yes.

20 Q. And would you agree with this, that the tests showed that it did not matter whether it was dry or oily cotton waste; you get the same effect. Would you agree with that? A. As regards the absorption?

Q. As regards the preferential absorption of oil and remaining on the water up to 14 hours. Would you agree it did not make any difference whether it was dry or oily cotton waste to begin with? A. No, I am afraid I cannot agree with that.

30 Q. You do not agree with it? A. Not now.

Q. Were you present at a test when some 40 grammes of cotton waste were wetted with furnace oil and dropped onto a quarter-inch layer of oil, from 9 feet, and it still kept preferentially absorbing oil and remained afloat? Do you remember that? A. Yes.

Q. For a period, as I say, up to 14 hours. Do you remember that? A. They did not all go to 14 hours.

40 Q. Well, for some substantial period? A. Yes, I will agree with that, for some substantial period.

HIS HONOUR: Q. I have no expert knowledge at all in any of these matters, but could you tell me why the fact that the waste had oil in it,

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H H.S.Parker
14th February
1963

Cross-
examination
continued

was impregnated with oil to a greater or lesser degree, let us say a large degree, would tend to make it sink more quickly? A. To sink through the oil?

Q. To sink? A. I think the reason for that is that a substance will mix with itself more readily than it will mix or wet anything else, and if you have cotton waste impregnated with furnace oil, in effect you are getting a union. The sinking of the cotton waste through the oil is due to the union -

10

Q. Of the oil with the oil? A. The film of the furnace oil with the furnace oil on the fibres of the cotton. There is a capillarity effect.

Q. But if your cotton waste is light enough to float on water, and your oil is light enough to float on water, why, when you put the two together, does it sink? A. Because the oil mixes a little bit more rapidly or wets a little bit more rapidly the natural wax on the cotton. Most cotton waste I think is left in the undewaxed condition.

20

Q. What effect does that have on the problem? A. That does make the oil wet the cotton fibres more quickly at first.

Q. But suppose it has wetted them. What effect then does that have on the sinking? A. The cotton waste cannot sink unless it is wet with something. If it is light enough to ride on the surface film, whether it be water or oil, it just will not sink. We have a parallel case in the case of kapok, which is definitely not wet by water at all. If you put kapok on water, it will float for a very considerable time. It is due to the fact that water will not wet the kapok.

30

Q. But once the water wets this thing, then it will sink? A. Then it will sink.

MR. ASH: Q. I will leave that matter for the moment, except to ask you one question on it. You do not dispute, do you, that if 20 grammes of cotton waste in its ordinary loose condition, that is to say, not spread out or not rolled up - do you follow? A Yes.

40

Q. - is dropped from any height at all, it would still float on the water? A. It will still float on water?

Q. Yes. When it hits the water it will become preferentially wetted with oil and float there?
 A. First of all you say water, and then you say oil.

Q. I agree - oil-covered water, any height at all? A. It will continue to float?

Q. Yes. A. For some period, "X".

HIS HONOUR: Q. You agree it would continue to float for some period, do you? A. For some period.

Defendants
 Evidence

No.25

H.H.S.Parker

14th February
 1963

Cross-
 examination
 continued

10 MR. ASH: Q. Do you agree further that the height of drop has nothing to do with it? A. Above a certain amount, yes. Above a certain amount you reach what is known as a terminal velocity, due to air friction on the body; in other words, if you drop pieces of cotton waste of a certain size from 30 feet, by the time it reaches the ground it will be travelling at a certain velocity. If you drop it from 300 feet it may not be travelling very much faster.

20 HIS HONOUR: Q. But you say if it hits the water covered with oil at certain velocities, because it has fallen from a certain height it would sink more readily, the reason being that it gets some water into it on its first descent? A. Yes.

Q. That is your theory? A. Yes. The higher you drop it, up to this height where it reaches this terminal velocity, yes, and then after that height it will not make very much difference.

30 MR. ASH: Q. Would you agree that when you come to obtain a thickness of film, oil film on water, for the purpose of a test you want to achieve, a certain thickness in a confined tin, the easiest way of doing that is by calculation? You know what I mean - A. You measure the area.

Q. And calculate the volume of the oil - mathematics and measurement. Do you agree with me that the easiest way to do that is by calculation?

40 A. No, not if you want to get the exact thickness. How are you going to apply the oil? I am sorry, I cannot ask you questions.

HIS HONOUR: Q. Whether it is the easiest way or not, you do not agree it is the best way, do you? A. No.

MR. ASH: Q. You did none of these tests of yours,

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

at any stage, by calculation? A. Not where I was attempting to achieve an oil film of a definite thickness, no.

Q. Of these tests, without going through them - one - sixteenth, one-quarter, one-eighth and so on - you never did it by calculation? A. No.

HIS HONOUR: Q. If you have a container with water in it and you put oil into it by pouring, will the thickness of the oil become approximately uniform over the whole surface area or will it not? A. It will if given sufficient time to spread, yes.

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Q. If it will not become approximately uniform, your point gauge test would have all the defects that were suggested that this other method has? A. It would.

MR. ASH: Q. And if it did become sufficiently uniform, it would be mathematically accurate? A. Using the point gauge?

Q. No, using the calculation method. His Honor put to you what would happen if it did not become uniform. I think it is a matter of inference. If I can come to Exhibit "1"(6), those are the ones where you took these pieces of hessian and lit them with a match? A. Yes.

20

Q. You lit the top of the hessian being held in a right angle position, with a match, burned the hessian, and you got - what does the "Yes" and "No" mean? A. "Yes" means that ultimately the film of oil became ignited and burned continuously. "No" means the opposite.

30

Q. It ignited and spread across the oil surface? A. Yes.

Q. That proved, as far as you could do it, when you got these bits of hessian, as you got them bigger, first of all, generally speaking, they tended to ignite better? A. That is correct.

Q. And also, as you got the oil thicker, they tended to ignite better? A. Yes.

HIS HONOUR: Q. That is, the oil tended to ignite better? A. That is correct.

40

MR. ASH: Q. It would follow of course, if that were any indication, that first of all a piece of hessian floating on the water in a position where it can catch alight, will act as a wick in certain

circumstances, floating in oil on water? A. I will agree with that very definite qualification.

Q. In certain circumstances? A. Yes.

Q. The thicker the oil film on the water, the greater the chance of the oil igniting?

A. That is quite correct.

Q. The larger the piece of hessian, the greater the chance of the oil igniting? A. Yes.

10 Q. And I suppose if the hessian is rolled up a bit instead of being flat, the better structure it is for being ignited? A. That is exactly what I found.

Q. So it is quite clear that a wide range of bits of hessian in oils, from one-eighth of an inch thickness going upwards, in your view can act as a wick to ignite the oil? A. That is what I found.

20 Q. And going back to Exhibit "1"(5), do you see that matter His Honour ask you about, that apparently anomalous "Yes" in "coke"? A. Yes, "red-hot coke dropped 2 feet."

Q. Do you understand that that result indicates that, at that thickness of oil, one-quarter of an inch, red-hot coke will remain in contact with the oil sufficiently long to set the oil alight? A. That is the result.

30 Q. On that same exhibit, you refer to the oxy torch. How long was the flame? A. the total flame length would have been about 4 or 5 inches, something of that order.

Q. You can vary the length of the flame, can't you? A. Yes.

Q. Did you try it at varying lengths? A. No. I tried the hottest flame.

40 Q. And you say that length is what? A. The total length of the flame, the hot zone in an oxy flame, is only about three-quarters of an inch and then there is an outer zone, the outer envelope, which could be 2, 3 or 4 inches long.

Q. What is the heat related to, the total length of the flame or the length of the hot zone? A. The length of the hot zone.

Q. How long was the visible flame, including

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Cross-
examination
continued

the outside of it, of the hottest flame? A. I used only one flame, so I cannot answer that. The temperature of an oxy-acetylene flame that is used for welding and cutting is of the order of 2,000 degrees Centigrade.

Q. Is the heat related to the length of the flame? I understood you to say it is not - it is related to the hot zone? A. Well, you can make a very long flame without oxygen in it, which is comparatively cold. Then, if you add oxygen to complete the combustion of the acetylene more quickly, the flame shortens up and you get a hotter flame.

10

Q. I know. You used, you say, the hottest flame, did you? A. Well, I used what I thought was the hottest flame.

Q. How long was it? A. I have already answered that, about 3 or 4 inches, the total flame.

Q. If I may come to Exhibit "1"(9), as I have noted it it was done with oil on top of 4 inches of sea water. Is that right? Have you got it there? A. Yes.

20

Q. And apparently in that test you got 100% success? A. That is correct.

Q. You did not try it, apparently, on one-sixteenth inch? A. No.

Q. Notwithstanding your 100% success on one-eighth inch. Is that right? A. That is correct.

Q. You lit that cotton waste with a match? A. Yes.

30

Q. I notice you say you had a wind velocity of 1.6 miles an hour. That, of course, is a very light wind, is not it? A. That is right.

Q. That wind, I take it from what you say, must have had some bending influence on the flame, to ignite the oil? A. That is so, yes.

Q. At 1.6 miles an hour? A. Yes,

Q. It inevitably follows from that, does not it, that the amount of wind necessary to bend a flame sufficiently is very slight? A. That appears from that, but it is not always the case.

40

Q. If that test were the only one performed, it is 100% correct, is not it? A. Yes.

Q. In giving your conditions for this matter, I am going to put to you that you omitted one, quite unintentionally of course. These tests, I take it, were performed in what, a kerosene tin or bucket? A. Various sizes of dishes and various depths of dishes.

Q. Was this lot, No.9, performed in the laboratory? A. Yes, I think it probably was.

10 Q. Where was your vessel, in fact? A. You mean on the bench or on the floor?

Q. Yes? A. In this particular test, this one would have been on the floor.

Q. How long did this series of tests take? Would it be a matter of - A. I am afraid I cannot answer that. When you do a series of tests like this, you have two times. You have the actual time of the test and then you have the time of preparation for that test.

20 Q. You would have your tin of water with oil on it, lying there for some time on the laboratory floor, would not you? A. Yes.

Q. If that happened, the water would be still, would not it? A. Yes.

Q. Have you ever sat, on a weekend, anywhere beside the harbour and seen always to some extent, but always, the water lipping, lapping against the shore or wall? A. I have seen that a great deal, but I have seen it perfectly still.

30 Q. Right at the edges, in Sydney Harbour, completely still, have you - absolutely no movement? A. I have not.

Q. And none of us would ever expect to find it? A. Not completely still; very still, yes.

HIS HONOUR: Q. You would have some slight movement from tide effects, would not you, even with no wind? A. I doubt whether you would be able to see those, tide effects.

40 MR. ASH: Q. Not necessarily noticing the mean or gradual rise over a period, in five or eight hours, but because the tide is coming in all the time there would be some small movement from that agency alone, at the extreme point, whether it be shore or wall? A. Very small, yes.

Q. You have always seen some movement and, of

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

course, with any sort of ripple or movement from vessels around, or even a slight breeze, whatever it is, it tends to increase in the harbour, does not it? A. It tends to increase the ripples?

Q. Yes. A. Yes.

Q. Therefore the movements where the water meets the shore or obstruction? A. Yes.

Q. And you would be the first to agree that a light floating object, whether it be a small square of wood or a bit of cotton waste or a bit of hessian or bit of rolled-up newspaper, would produce, because of the lightness of the floating object, constant movement while that ripple was going on? A. Yes.

10

Q. You would further agree, therefore, that that movement could cause the necessary bending of the flame to take the position of the slight wind? A. No.

Q. You would not? A. No.

Q. It would have no effect at all in that direction? Is that what you say? A. No, I do not say that. There might be occasions on which it would not have sufficient effect.

20

Q. There might be occasions on which it would not have sufficient effect. Of course, then it naturally follows, to complement that statement, that there must be occasions when it would have sufficient effect? A. Yes, if the flame stayed alight under those conditions.

Q. And postulate a complete absence of wind as such, but from other agencies, whether it be a moving boat 100 yards out, a launch or other agencies which come to mind, but completely still air, you would get sufficient movement in the water to bend the flame down, if it stays alight? A. No, I do not think you would.

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Q. HIS HONOUR: Not to bend the flame down, but to bring the flame into close proximity to the surface oil? A. No. If you have perfectly still air and you have a wick of some sort with a flame coming up off it, I will grant you the movement which you postulate is going to move that around in all directions, but I think the flame will continue to go straight up and the base of the flame will bend, but the bulk of the flame will

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continue to go straight up on account of the connexion currents which are caused around it, and they must be appreciable if you postulate no wind.

MR. ASH: Q. Are you serious in this view, that if you have a bit of cardboard moving its base, with ripples like that - not a big plank - that that flame is going to stay like that and its bottom like that? Are you quite serious?

10 A. Yes.

Q. Have you seen that happen? A. No. I am postulating that.

Q. If you had a tiny bit of wind, plus some such movement, would the combined effect be greater than that of a similar amount of wind alone, for this purpose? A. What do you mean by a tiny bit of wind?

Q. One mile per hour, to start with? A. Yes. The two effects could act in concert.

20 Q. To give a greater effect in the aggregate than the one mile per hour wind alone? A. Yes.

Q. And so on with the increase of the wind and with the increase of the movement? A. Up to a point.

Q. I suppose out in the surf you might get the wick put out, if it was thrown over far enough? A. Not only out in the surf. You could get conditions rough enough around the harbour.

30 Q. Of course you could. You have launches and things like that going about all the time in the harbour? A. Yes.

Q. You would agree that the water movement position is relevant, in the harbour, to this question of a wick having its flame brought to the required proximity of the oil in water?

A. Where you have what you keep describing as boundary conditions, yes - if you have such a wind that it is just not quite enough to bend your flame over.

40 Q. This added factor could make all the difference? A. The water movement could make the necessary difference.

HIS HONOUR: Q. You mean because the water movement itself brings the oil surface closer to the flame? A. May we put it this way? Under those conditions the flame and the oil surface would come closer together.

Defendants
Evidence

No.25

H.H.S.Parker
14th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker

14th February
1963

Cross-
examination
continued

Q. Partly because of the movement of water?
A. Partly because of the movement of water.

Q. Well, why cannot they come closer together, by movement of water without wind, closer together than they would be if the water were perfectly still?

A. Well, I think this question of convection current is quite important. Movement of the support on which your flame is, or the base of the flame, is not going to cause movement of the top of the flame. There is no rigid contact, no rigid joining of the top of the flame with the base, and I maintain that your base will move and the flame will continue to go not quite as straight up as before, as it did, but reasonably straight.

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MR.ASH: Q. A little bit of movement? A. A little bit of movement backwards and forwards, but not in one direction.

Q. Postulate a flame in conical shape? A. Yes.

Q. The base of the cone going like this but this never moving a millimetre. A. I did not say that. The cone will move a little bit and just down below, will move a little more, and a little more, until you get to the base, but I maintain that the top of the flame will not bend right over in one direction.

20

Q. That, of course, is not necessary for ignition, is it; not right over sideways? (Withdrawn)

Q. I have the picture of this cone base concertinaing this side of the flame, and this side stretching then reversing the position. Is that right? A. I follow what you are describing, but -

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Q. It sounds a bit ridiculous, does not it? A. No, but I do not think it is quite correct. What you are postulating is that you have a definite film. You are postulating something that could happen with a film, and there is no film there. You have no connection between the products of combustion of the gas at that point, with any point below it. They are entirely separate.

Q. What gas were you talking about then? A. The products of combustion of your wick - your CO₂ and your water plus heated nitrogen.

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Q. You could not explain to me just before 4 o'clock how one side of the cone could go up and the other side be stretched and the centre point be immovable? A. I did not say the centre point would remain immovable. I said there would be very slight movement in it, with no pronounced bending.

Q. I take it you have never examined this phenomenon at all? A. Not in connection with this, but I have noticed a candle floating on a piece of wood.

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(Further hearing adjourned until 10 a.m. on Friday, 15th February 1962.)

DP/CJ4
IN COMMERCIAL CAUSES. Nos.3000 & 3001 of 1955

Defendants
 Evidence

CORAM: WALSH, J.

No.25

THE MILLER STEAMSHIP CO.PTY.LIMITED v. VACUUM OIL
 CO.PTY.LTD. CALTEX OIL (AUST.) PTY. LIMITED and
 OVERSEAS TANKSHIPS (U.K.) LIMITED

H.H.S.Parker

15th February
 1963

R. W. MILLER & CO. PTY. LIMITED v. SAME

Cross-
 examination
 continued

EIGHTH DAY -- FRIDAY, 15TH FEBRUARY 1963.

HOWARD HENRY SHELLEY PARKER

Cross-examination continued:

10

MR. ASH: Q. Getting back to these experiments that you dealt with, have you done any more experiments since yesterday's hearing? A. I have.

Q. In relation to what? A. The effect of waves on flames.

Q. Any other matter? A. Yes, very small experiments on the combustibility of samples of waste which had been lying in contact with oil and water for more than three days.

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Q. They had been lying then, before yesterday? A. They were lying before yesterday.

Q. As I understand the position, prior to the earlier hearing, some 500 man hours were spent in tests on these very matters? A. Yes.

Q. And one major portion of the tests was the ignitability of oil floating on water, with various materials? A. Yes.

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Q. And now you have done some extra ones, with minor bits of material? A. Some minor experiments.

Q. What sort of experiments? A. Well, I have had two portions of waste soaking in these composite mixtures of oil and water for more than three days. I soaked them for three days for another experiment and last night I endeavoured to ignite the surfaces or some of the surfaces of these bits of waste and oil.

Q. What were the substances? A. The substances were waste.

40

Q. Cotton waste? A. Yes, cotton waste.

Q. Getting back to the first lot, the movement of the floating flame, the floating wick - A. Yes.

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

Q. Do you alter your opinion that the wick would have some movement? (Objected to)

A. I did not agree with you there. I agreed that under the influence of waves, the wick might be moved.

Q. It would be moved, would not it? A. Yes, it would be moved. You were asking me whether I had altered my opinion.

Q. Have you? A. No - the wick as distinct from the flame.

10

Q. Will obviously be moved? A. The wick will be moved.

Q. And the flame, at its top, will have only a small movement? A. The flame will not move very much.

Q. And all your opinions given yesterday in regard to that matter are confirmed, as the result of your tests? A. They were.

Q. How did you get along with the igniting of these things, after three days? A. There were two samples, one mass of 20 grammes of waste which had been placed on a layer of one-sixteenth of an inch of furnace oil on water, and there was no chance of igniting this at all. The only exposed portions of the waste were heavily wet, and they were saturated with water, and a match held in contact with those for ten seconds or until such time as the match went out, did not even scorch the waste. In the case of the other one, that was a piece of waste of the same weight which had been saturated with used engine oil, and this had been placed on a layer of three-eighths of an inch of oil. Now, there were three definite portions of that piece of waste which I tested. There was a portion -

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MR. MEARES: Q. Is this 20 grammes too? A. This is still 20 grammes. There was a portion of the waste projecting above the level of the surface of the oil, and wet with oil. On testing that with a match, it ignited very easily. In the centre of that mass of waste, as I think I described to you yesterday, there was a patch on the waste which was not covered with furnace oil, and I tested that and that would not light under the same conditions. Through this patch, looking down into the mass, into the centre of this body of the piece of waste, there was a further

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mass, further portion of the cotton waste from which the lubricating oil had been displaced by water.

10 MR. ASH: Q. How did you know that? A. Two reasons. The lubricating oil which I used conferred upon the waste a very definite yellow colour and in this particular portion of the waste, that colour had been completely leached out and the waste had returned to its original white colour and further, the other reason, I fished a portion of that out with a very fine wire hook, so as not to cause any great disturbance, and that also, on testing with a match, spluttered as a wick does when it is wet with water.

Q. Were these bits of cotton waste dropped on to the surface originally? A. Originally, yes.

Q. After three days, portion of it was ignitable? A. After more than three days.

20 Q. After more than three days, portion of that waste was ignitable? A. Not the cotton waste; the oil on the cotton waste.

Q. Oil on the cotton waste, I take it, was mixed with the cotton waste, with portion of it? A. It would be the oil that ignited first. The oil was on the surface of the waste, and if you have a layer of oil over the fibres of the cotton waste, it will be the oil that ignites first.

30 Q. When the oil ignited, the cotton waste ignited in that portion? A. Not necessarily.

Q. Did it? A. No. It was the oil which ignited.

Q. Do you mean to say that none of the waste burnt with the oil soaked into it, in that portion? A. No.

40 Q. How did you detect that? The oil burnt. You have portion of a piece of cotton waste soaked with oil after three plus days. Is that the position? (Objected to).

Q. Did you get the oil to ignite on the water, as the result of this match? A. I did not get it to ignite on the water. The oil I ignited was on the cotton waste.

Q. When it ignited, you say it burnt? A. Yes, the oil burnt.

Defendants
Evidence

No.25

H.H.S.Parker

15th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963
Cross-
examination
continued

Q. What part of the oil burnt? A. Sorry. I cannot follow it.

MR.MEARES: You have a wick. A wick does not burn.

MR. ASH: Q. A portion of the cotton waste had oil on it at the end of three plus days?

A. Yes.

Q. You applied a match to it? A. To the oil on the waste.

Q. And the oil burnt and the cotton waste remained absolutely white, did it? A. I do not know that, because it was still covered with unburnt oil. Some oil burnt and some oil did not.

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Q. Do you tell His Honor today that you did not see, when that oil on the cotton waste burnt, whether the cotton waste on which the oil was, burnt also? Do you say that? A. I do say that.

Q. So the oil burnt and the cotton waste was in a state where it would be if the oil had completely evaporated from it and it was in its what I will call native state. Is that right? A. No. I cannot tell that. The cotton waste was still covered with furnace oil. In other words, all the furnace oil that covered this piece of waste had not burnt. There was still some left covering the waste, and as the oil was black I could not see through that and describe the state of the cotton waste.

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Q. Did you examine the cotton waste after the flame of the oil? A. No.

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Q. In what size receptacle did this take place? A. This was a dish $7\frac{3}{4}$ inches in diameter and $4\frac{1}{2}$ inches deep.

Q. Did you say $7\frac{3}{4}$ inches in diameter? A. $7\frac{3}{4}$ inches in diameter.

Q. And that is the area over which you had oil spread? A. Yes.

Q. I will get on to something else. Getting back to your tests here, the original ones, I was asking you about test No.1(9). Have you the documents in front of you? A. No.

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Q. I am not quite clear about all that was said as to 1(10), as to whether that oily cotton waste referred to in (10) was, at the time of the

experiments, on a solid base or on water?

A. That was on a solid base.

Q. And you got, from the drop of metal fragments, a 100% return of inflaming, although two were delayed? A. Yes.

Q. What was No.11?

HIS HONOUR: It is not one of these things.

MR. ASH: Q. No.(12) was done on bark? A.Yes.

10 Q. And you got 100% return there? A. One hundred per cent success, yes.

Q. When you say in Exhibit "1"(12), "Oil layer ignited" in the last column, what was the oil layer there referred to? A. How thick or what oil? Half an inch of furnace oil.

HIS HONOUR: The thickness is in the left-hand column.

20 MR. ASH: Q. You had a thickness on a solid base or bark there? How did you contain the oil at a uniform thickness, as in the first column? How did you contain it during the experiment, at that uniform thickness, on bark? A. This bark was floating on water.

Q. Does the thickness of oil layer refer to the oil layer on the water? A. The thickness of oil layer refers to the - yes, on water.

Q. How big was the container in the experiment? A. That was roughly 3 x 4 ft. in cross-sectional area, with a layer of water or a depth of water of 4 inches, I think - between 4 and 5 inches.

30 Q. You are not suggesting, are you, for the purposes of these experiments the depth of water under the oil is of any relevance? A. Not beyond a certain amount. If you have a very small amount of water you will not get heat losses but, generally speaking, no - as long as there is enough water to float the wick and its support, I would agree with you there, yes.

40 Q. And in all these experiments in which water was used there was, in fact, enough water to support the wick? A. There was ample water to support the wick and not to give any material difference to the result if the layer of water had been increased to say so many feet instead of inches. In other words, I endeavoured to eliminate that factor.

Defendants
Evidence

No.25

H.H.S.Parker

15th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker

15th February
1963

Cross-
examination
continued

Q. And you think you did, in the sense that provided there was ample water to support the oil with the material on top of it, thereafter the depth of the water is of no significance. That is what you mean, is not it? A. That is what I think, yes.

Q. In Exhibit "1"(13) I see you have 100 per cent result? A. Yes.

Q. What was the size of the container in that? A. That was the big container, again 3 x 4 ft. 10

Q. And in both No.12 and No.13, the oil ignited and burnt to the limits of the container on every experiment? A. Unless I doused it first. Had I left it a matter of a few more seconds, it would have. I can say quite definitely yes.

Q. From No.13 on are experiments with an oxy welder and an oxy burner, with an electric welder and an oxy burner? A. Yes.

HIS HONOUR: Not all of them from No.13 on.

MR. ASH: Q. No.14 was done on a solid base, I gather from you? A. Yes. 20

Q. And when you say solid base, you mean a completely solid base and not a solid base floating on water? A. I mean a completely solid base.

Q. A number of entries there say "Not tried." Was that just fortuitous, or what? A. No. I am afraid I cannot answer that question. It may have been pressure of time.

Q. At all events, as far as that experiment is concerned, it was droppings from welding operations, oxy and electric? A. In this particular one oxy-acetylene cutting, which is slightly different to welding. 30

Q. Dropping of these molten pieces from a height of 13ft. 2ins.? A. Yes.

Q. Can I ask you as to No.15? This was the electric arc welder one, from 30ft. 6ins.? A. Yes.

Q. The first one, you say, did not ignite in 180 seconds. Do you see that? A. Yes. 40

Q. The reason that did not ignite was because nothing landed on it. You know that as a fact, don't you? A. That could be.

Q. I am putting it to you that it was. A. No. I cannot agree to that.

Defendants
Evidence

HIS HONOUR: Q. What is being dropped in this case of No.15? A. In this particular case what was being dropped was a shower of sparks from the electric arc welder.

No.25

H.H.S.Parker

15th February
1963

MR.ASH: Q. And the waste was dry? A. Yes.

Q. And what was it floating on, water or water plus oil? It would appear to be water only here. A. No. It was on a solid base, this particular one.

10

Cross-
examination
continued

Q. No.15? A. To the best of my knowledge, yes - yes, a solid base, that one.

Q. No.16, however, was certain done with floating waste, was not it? A. No. It was done with oily waste.

Q. I have here a note that you said yesterday it was. I could be wrong. A. It was done on a firm base, for this reason, if I may speak -

20

Q. Yes. A. These two series, "1"(15) and "1"(16) were carried out to compare the ignitability of dry and oily cotton waste under identical conditions or as identical as possible. I would not put the oily waste on a floating base if I had done the dry waste on a solid base. I am quite sure that they were both done on the solid base.

30

Q. Of course, you have spent some time examining the general background of this case and the facts of it? A. Yes.

Q. And you would have learned during that study, that the cotton waste being talked of in this case is cotton waste which is used, one of its main purposes, to rub the hands after lubricating? A. Not only after lubricating, but after all sorts of workshop operations.

Q. Involving oil? A. And other materials.

40

Q. Well, to a large extent oil. Do you agree with that? A. I would prefer to give the wider classification, to wipe the hands.

Q. A material portion of the wiping of hands would be wiping oil off the hands? A. A material portion, yes.

Q. What other wiping do you envisage? A. Well,

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

one can wipe oily hands, one can wipe wet hands,
and one can wipe sweaty hands.

HIS HONOUR: Q. Or grease? A. Or grease.

Q. Grease as distinct from oil? A. Yes.

Q. MR. ASH: At all events you got, with the
oily waste from 30 ft., another 100 per cent
return, using an electric arc welder? A. Yes.

Q. And every one ignited in under a minute
except one, which ignited in a minute?
A. Ignited in?

10

Q. Except one, which ignited in exactly a
minute? A. Yes.

Q. I suppose there was no spreading of the
flame because there was no oil around the cotton
waste at the time? A. In these particular
experiments?

Q. In these particular experiments? A. No.

Q. To sum up the position, I asked some ques-
tions yesterday about cotton waste floating on
oil on water. Do you remember that? A. Yes.

20

Q. You said that if dropped, it would float in
all cases for some time. Do you remember saying
that? A. Yes.

Q. You expressed the view that in some cases,
it would drop through the film of oil and become
wetted with water initially? A. Yes.

Q. And you agreed that that was less likely if
the oil, on impact with the water, was itself
coated to some extent, impregnated with oil at
that stage A. No. I think you meant if the
waste were impregnated.

30

Q. If dropped and, at the moment of dropping,
the waste was impregnated with oil, it was less
likely that it would drop through and be impreg-
nated with water? A. With a few reservations,
I would agree with that.

Q. That is the general tendency? A. That is
the general tendency.

Q. This is necessarily the position, that the
thicker the oil on the water the less likely is
an open piece of cotton waste, about 20 grammes
say, to fall through the oil? A. That is
correct.

40

Q. In particular, if you took an oil on water of this thickness, described in this way, that when a piece of concrete or stone indeed was dropped from some 12 to 15 ft., perhaps a little higher, 18 ft., onto the oil on the water, it almost stopped in its descent and went very slowly through the oil - do you follow me?
A. I follow you.

Defendants
Evidence

No.25

H.H.S.Parker

15th February
1963

Cross-
examination
continued

10 Q. Oil of that thickness, thick enough to cause a bit of concrete dropped from say 15 ft., to take an average of distances, or even a stone - do you follow? A. Your proposition is a layer of 2 inches of furnace oil floating on water?

20 Q. You think it would require 2 inches to do that, do you, to have that effect on a piece of concrete or small stone? A. No. I am not making any statement about that at the moment. I am trying to get the conditions which you are postulating.

HIS HONOUR: Q. Mr. Ash did not give any measurement of the thickness. He is only seeking to give some indication of the thickness by reason of this behaviour of the piece of concrete. Do you follow? A. I am sorry. I assumed too much. A thick layer of oil, shall we say, or a layer of oil?

MR. ASH: Q. Of this thickness? A. Which thickness?

30 Q. A man standing some 12 ft. or 15 ft. above it, with his hand above that height by reason of the height of his body, throwing a small piece of concrete or, indeed, a small stone of undefined precise dimensions but down to the size of a large marble. Do you follow?
A. Yes.

Q. Dropping either of those objects from that position, onto a film of oil on water? A. Yes.

40 Q. I put it to you that if a piece of cotton waste was dropped at the same time onto that same film in the same place, and it was a bit of cotton waste normally spready out, not torn apart or closed up, it would not go through the oil at all, would it? A. The cotton waste?

Q. Yes. A. No.

Q. And indeed, the oil could be less thick

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

than that description conveys to your mind, and the cotton waste would still not go through it in those circumstances, would not you agree?
A. Yes.

Q. And of course, if it did land on oil on water of that type it would, however much impregnated with oil from being completely dry, up to saturation with oil before being dropped - do you follow? A. Yes.

Q. It would stay on the oil and preferentially wet itself with the oil in those circumstances?
A. It will stay on the oil.

10

Q. And continue to absorb oil insofar as it was not saturated, in those circumstances? A. For some time, yes.

Q. And would preferentially completely wet itself with oil, in those circumstances, before any water entered it. You would expect that, would not you? A. Yes. I would expect that, yes. I would agree with that.

20

Q. And indeed, that would apply, one might say, in those circumstances of oil, to anybody of cotton waste that fell on the water from say 15 ft., would not it? A. Providing it does not penetrate the oil.

Q. But any larger bit of cotton waste up to an 80 gramme piece, not pressed up or stretched out, an ordinary piece, falling from 15 ft. on that thickness of oil? A. A film of oil?

Q. No, the thickness I described to you.

30

MR.MEARES: The non sequitur is as to the initial thickness of oil. We had the marble test and my friend then put the cotton waste. I do not want to say any more.

HIS HONOUR: I can understand the line of questioning. Whether the conclusion he seeks to get from it is a valid one is another matter.

MR.ASH: Q. I will read you a description by a layman, non-scientist, of that incident with the stone and concrete, to indicate the thickness of the oil. What was thrown over was a small piece of concrete. Have you a doorknob in front of you? A. I have.

40

Q. Hold it up - of the size, roughly, of the bottom, wider portion, the handle portion, or

going down in size to a stone the size of a marble. Do you follow me? A. Yes.

Q. Within that range. I should have said a large one. A. Yes.

Q. Assuming that this was a layman's impression of it, dropped from some 18 ft., that when it hit the oil it was just like seeing it go into sloppy cement, it just like bubbled a bit - do you see? A. Yes.

10 Q. Before it sunk through. Do you follow that description? A. Yes.

Q. You have given your view of a 20 gramme piece of cotton waste falling on that. I am asking you would your remarks in regard to the 20 gramme cotton waste also apply to an ordinary 80 gramme piece of cotton waste dropped from that height? A. Yes.

20 Q. And it would also apply to hessian dropped from that height, as regards going through? A. Yes.

Q. And to rolled-up newspaper? A. Yes.

Q. And generally, to all debris of a similar -
MR. MEARES: Weight.

MR. ASH: Q. I was going to say, specific gravity?

A. I would prefer the use of the words "specific gravity?"; or, to put it a little bit more definitely, of the same apparent density.

30 Q. And you have said that in each of those cases, the dropped piece would float, absorb oil insofar as it had room for it and stay there for a long time? A. No. I have not said that. I said it would float on the surface for some time.

40 Q. I thought you said a considerable time. You would agree that that would also apply even if the oil was a bit thinner than that description reveals, would not you? A. The time which the dropped object would remain on the surface would be shorter. It would remain on the surface for some time, but the time would be shorter. I presume by thinner oil you mean oil of a lower viscosity.

HIS HONOUR: Q. No, a thinner layer. A. Now which?

MR. ASH: Q. Does that description that I gave

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

you reveal to your mind a thick layer of oil?

A. It does not reveal any layer at all. I am endeavouring to find out which you mean by the term "thin", thin in dimensions or thin in viscosity.

Q. That description of that oil I gave to you, with the performance of that object going through it, does not reveal a comparatively thick layer of oil? A. You used the term "film".

HIS HONOUR: The witness whose evidence, in effect, 10 you have been asked to assume is correct, was speaking of throwing something into the furnace oil onto the water near the "Corrimal" - that oil. He gave this evidence about the piece of concrete or stone or whatever it was, as read to you. That is the set-up you are being asked about.

MR. ASH: Q. Does that description of the oil reveal to you a comparatively thick layer of oil? A. No.

Q. Does it reveal to you any oil on the water? 20
A. It reveals to me oil on water, but does not give any indication of thickness.

Q. It relates solely to viscosity, does it?
A. Thickness as regards thickness of layer. Your description does not give you any idea of the dimensional thickness of the layer, not the thickness as measured by viscosity.

Q. We will take it step by step. Does it reveal to you the possibility that that oil could be one-sixteenth of an inch in thickness, measured? 30
A. It could have from that description, yes.

Q. What sort of oil would that be, tar?
A. Well, it would be a furnace oil.

Q. A furnace oil of one-sixteenth of an inch could give that result, to your mind, with a piece of concrete the size of that doorknob, dropped from 18 ft.? Are you serious? A. We are not talking about concrete. The last materials mentioned were these low specific gravity materials. 40

Q. I described it to you in terms. Would you like it read again? A. No. I know that. I am sorry, but you went on to -

Q. A mistake has been made but we will clarify it. Oil which had that effect on dropping the stone or concrete. I will read it again.

A. I remember the description.

Q. Does that oil so described, reveal to you thick oil on the surface of the water? A. If the description is correct, yes.

Q. You would not deny, would you, that you have known for a long time that oil can be ignited if a flame is near it? A. I would not deny that.

10 Q. That has been common knowledge for a long time? (Objected to; rejected.)

Q. It has been common knowledge among chemists and allied scientists for a long time? (Objected to; allowed.)

Q. Has not it? It has been common knowledge among chemists and allied scientists for a long time, that oil will ignite if a flame is near it? A. If it is near enough to it, yes.

20 Q. I accept that qualification. To put it more precisely, if there is a burning agent, such as a wick, sufficiently close to it - that is something which describes it more closely? A. Yes.

Q. Will you agree with me that when you come to oil being set alight by a burning wick, the chances of it so being set alight increase with its thickness? A. I would agree with that, yes.

Q. And that proposition would apply whether it was lying on a solid base or on water? A. Yes.

30 Q. Thickness, when you are speaking of the danger of oil, assuming a flame, the danger of oil burning, would be the first matter you would inquire into, would not it - the thickness of the oil?

MR. MEARES: I did not catch that question.

40 MR. ASH: Q. When you are assessing the danger of a body of oil floating on water, being set alight, there being an initial burning flame by way of a wick present, the first thing you would want to know in assessing the risk of that oil burning, would be the thickness of the oil?

MR. MEARES: He has already said that the thicker the oil the greater the danger.

HIS HONOUR: He is being asked, as I understand

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.K.S.Parker
15th February
1963

Cross-
examination
continued

it, whether that is the paramount consideration. He is being asked whether that is the first thing you would inquire about.

MR. MEARES: With respect, I do not object.

MR. ASH: Q. That would be the first thing you would inquire about? A. Yes, I would agree with that.

Q. And would you agree that when oil is floating, the heavier the oil the thicker it is likely to be unless of course it is manufactured thickness, experimental thickness, measured? A. You mean providing there is sufficient area for it to spread freely? 10

Q. Yes. A. In other words, it is not completely surrounded by a barrier?

Q. Yes. A. Yes, I would agree with that.

Q. Would you agree with me that if an oil is floating on the harbour where there are ordinary winds and tides, necessarily it would tend to become thicker where the foreshores are than in the more open part? A. Providing none of the original volume of oil escaped from that particular area, yes. 20

Q. The area of spillage? A. Yes. It does not matter whether it is area, volume, or weight. Providing that original amount remains in the original situation and none is carried away by any agency whatsoever, then I would agree with your proposition.

Q. And once you get thick oil on water the flame, if there is one on it, an igniting agent, will tend to ignite the body of oil on the water more readily than with a thinner film? A. Fundamentally, yes. 30

Q. And would you agree with me that the concept of the flame, of a floating wick bending over is not a necessary step to ignite the oil floating on the water, on the harbour water? A. I am sorry. I cannot answer that question. I have not done any experiments on the open harbour. 40

Q. Would you agree with this opinion, that if there is some wind or something to put the flame down, that helps, but it is not one-hundred per cent essential. Would you agree with that opinion? A. It is not one hundred per cent

essential, yes, I would agree with that.

Q. There is no doubt, of course, that if you have oil lying right over the water, to the extent of the Sheerlegs Wharf, underneath that, a continuous line, once a wick burns for a sufficient time there is an obvious danger of the fire spreading fairly rapidly? A. There is an obvious danger of the fire spreading, yes.

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

10 Q. Would you agree with this, that a flame, when starting to ignite on the oil on the water, from then on spreads in a fashion of geometrical progression? A. Yes, I would agree to that,

Q. Would you agree that the thicker the oil, the quicker it will spread? A. Not unreservedly, no; up to a point.

Q. It is a contributing factor? A. It could be a contributing factor, yes.

20 Q. You would, of course, agree that that stage having been reached, any wind would accelerate the spread? A. In other words, the surface of the oil is alight?

Q. Yes, the wick has fringed the oil on the water; any wind being present, depending upon the degree of wind, would accelerate the spread? A. Up to a certain velocity of wind, yes.

Q. Provided it is not sufficient to put it out? A. Yes, I would agree with that.

30 Q. If I may take it step by step, in ordinary parlance you would agree that if there is an ignition wick floating for a long enough time, the presence of a continuous film of furnace oil on the water, presents a fire danger, once you have your wick? A. Providing you have your wick alight and providing the wind is within certain limits, yes.

Q. Even without the wind it will spread, won't it? A. Once the oil gets afire.

40 Q. Once it gets to a stage where there is an established fire? A. On the oil.

Q. Of even a foot in diameter - A. On the Oil?

Q. On the oil on the water? A. Yes.

Q. You would agree that the presence of the oil over the whole area, at that stage would

Defendants
Evidence

No.25

H.H.S.Parker

15th February
1963

Cross-
examination
continued

constitute an obvious fire danger? A. Yes.

HIS HONOUR: Q. If you had your piece of cotton waste or hessian or the like floating on water on which there is a film of oil and you get your cotton waste or hessian alight - it is burning?
A. Yes.

Q. - and if you do not have the bending over of the flame by wind or some other circumstances, which brings the flame of the burning waste into closer proximity to the surrounding oil, would you say that normally the waste or hessian would burn itself right out without igniting the surrounding oil? A. There are circumstances where that could happen, where the wick could continue to act purely as a wick until the available oil were exhausted.

10

Q. But I am thinking of it on a substantial expanse of oil-covered water. We have had a lot of talk about this bending over of the flame. I wanted to know whether it is or is not likely that if this waste burned, although it was nearly all consumed - do you follow? A. Yes.

20

Q. - whether it is or is not likely that it would set fire to the surrounding oil, even without any other factor being present to bend the flame towards the oil. Can you help me on that. A. Well, we have postulated that the wick must be supported on something, so that it would not sink through the oil. May we postulate that in this case?

30

Q. Yes; that for some reason it does not sink through the oil into the water. A. Yes.

Q. Yes, postulate that. A. In that case there is a possibility, a distinct possibility that the flame would continue to burn for a very long time without actually setting fire to the oil. I do think that ultimately the oil, the surface of the oil, would catch on fire.

MR. ASH: Q. You do or you do not?

HIS HONOUR: Would catch on fire.

40

WITNESS: It could be some very considerable time though, measured in fives or tens of hours, or hours at least. I hesitate to become technical in these matters. I do not wish to waste the time of the Court, but the fundamental of this thing is heat exchange, the passage of heat from

the flame to the surface of the oil, to bring it up to the point where it will catch on fire, and with some circumstances, that could take a very very long time. If I may just refer to one of the experiments which I did, one of these small scale experiments with a hessian wick, some of these burned for four hours before going out. Does that answer your question?

Defendants
Evidence

—
No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

10 HIS HONOUR: Q. Yes, it does, at any rate in part. I am just trying to find out what is the extent of the importance of this problem which has been discussed a good deal already in the case, of the necessity of having a wind, necessity or otherwise of having a wind to bend the flame over towards the water. A. May I put it this way, that under some circumstances wind would be absolutely essential. With a small wick and a small flame, it is my considered opinion that a wind, within certain ranges of velocity,
20 would be almost essential to cause ignition of the surface of the oil.

Q. But if you suppose a large piece of material which itself becomes ignited - A. Yes.

Q. - and it is to some degree at any rate, impregnated with oil? A. Yes.

Q. If you supposed that, would this be correct, that it is likely that it will cause an oil fire but that the spread of the fire is likely to be delayed? Is that right or wrong?

30 MR. MEARES: Without wind, or with wind?

HIS HONOUR: I will say without wind. A. In other words, the chances of a large wick setting the oil on fire, in the absence of wind, is more likely than in the case of a small wick - yes - quite definitely, that is so.

MR. ASH: Q. Take the position I was coming to. Postulate no wind. You have just got an ignited piece of waste on the water, ignited, floating on the oil on the water. Of course, whether that
40 will ignite the oil on the water, there being no wind, depends to a very large extent on the extent of the oil over the water, does not it? A. No, I cannot agree to that.

Q. I beg your pardon? A. No.

Q. Don't you know that when the wick is burning on the water - take a piece of cotton waste in

Defendants
Evidence

No.25

H.H.S.Parker

15th February
1963

Cross-
examination
continued

flame, on the water, with the oil of course - it draws upon the oil immediately around the bit of cotton waste? A. Yes.

Q. First of all, it tends to vaporise the oil immediately around the cotton waste? A. Yes.

Q. And it also, secondly, tends to drag into the cotton waste itself, the oil immediately around? A. Yes.

Q. Those two facts being established, obviously if you have that bit of cotton waste floating in say a 3 x 3 ft. container - A. Yes.

10

Q. - it could well happen that it would draw all the oil within that small area, and then go out? A. That is so.

HIS HONOUR: Q. Having thus consumed all the oil - is that what you mean? A. In its immediate vicinity, yes.

Q. We are assuming at the moment that the oil in its vicinity is limited in quantity, limited to this container? A. Yes.

20

MR. ASH: Q. But if, of course, there is an unlimited lateral supply of oil, by reason of the wide spread on the water, that alters the whole position on those facts, does not it? A. Yes.

HIS HONOUR: Q. Long before it could consume all the oil by sucking the oil into itself, the fibre or other materials of the waste would all have been consumed. Would that be right? A. Yes.

Q. And when that stage is reached, that the hessian itself or cotton waste, or whatever it is, is nearly all consumed, am I right in saying that there could be a danger of it setting fire to the surrounding oil, not the oil that is in it, but the surrounding oil? A. After all the material of the hessian -

30

Q. Not after all of it has been consumed, but after a lot of it has been consumed and there is not much left? A. There is a danger, yes.

HIS HONOUR: I would have thought so, but I am no scientist.

40

MR. ASH: Q. So that all these factors render the situation more dangerous - (Objected to)

Q. The following factors. First of all, the amount of wind. I am postulating oil on water, with an ignited wick, of cotton waste floating on

it. I am postulating those facts. Do you follow? A. Yes.

Q. All these factors I am about to say, increase the fire risk; first, the extent of the oil on the water laterally? A. Yes.

Q. Secondly, the thickness of the oil on the water? A. Yes.

10 Q. Thirdly, an increase in wind up, of course, to a point where it starts to have a reverse effect, towards putting it out? A. Yes.

Q. And on that point, to interrupt the train, I note that in experiments -

MR. MEARES: Why not finish?

MR. ASH: Q. Fourthly, that movement on the water, coupled with wind can, as you said yesterday, accentuate the bringing into nearness, of the flame and the water? A. It comes under the same heading as wind. Up to a certain amount of movement, I will agree with that, yes.

20 Q. A certain amount of movement, coupled with the wind, can accentuate the movement? A. Yes.

Q. And next, the position is accentuated progressively, on the containment aspect. If you have it on absolutely unlimited water, the more containment of the area of the fire that you get, by reason of surrounding objects, again the danger is increased? Never mind the degree of it for the moment; it is, in fact, increased? A. I cannot answer that.

30 Q. I will be a bit more specific. While the wick is burning it is, of course, vaporising the oil immediately around it? A. It would be vaporising the oil on the wick.

Q. Of course it will, but the heat of that wick peripherally vaporises the oil around the wick, does not it? A. Yes.

Q. And it is that continuous process that is the basis of the geometrical progression of expansion to which you referred? A. Yes.

40 Q. I put it to you that that process will be accelerated if the oil on the water is in a more contained area than in an unlimited expanse of open water? A. Yes, but to a very slight degree.

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

Q. The degree depends upon the circumstances of the containment, does not it? A. It depends also to a certain extent on the relative areas of your original fire and the original areas of this partly contained area, this restricted area.

Q. It depends on the measurements of the area?
A. Yes, let us say that.

Q. (Approaches witness): If I show you this chart, Exhibit "D", the fire was, at about 2 p.m. on 1st November, which would be in the column over here, the last column - the wind was north-east, 10 miles an hour at 2 p.m. It had been 11 miles per hour at 1 p.m., 9 to 12 noon, and then of various lighter degrees, from other directions, for some hours before. Do you follow?
A. I see those figures, yes.

10

Q. Mr.Meares was putting to you yesterday the hypothetical position of an 11 miles per hour wind being ideal, and you agreed that about that would be very good? A. I did.

20

Q. Of course you would know, from common sense if nothing else, that when wind is known over the two or three hours before this incident, to be as described in that chart, the reality of the position is that you would expect light breezes, under that wharf, all the time, would not you?
A. Not necessarily light breezes. Those wind velocities, as determined, are only averages over the times for which they are taken.

HIS HONOUR: Q. You could have gusts of considerably higher velocity? A. Yes, you could have gusts very much higher.

30

Q. And then, of course, you could have periods when it was down below that average velocity?
A. Yes.

MR. ASH: Q. But having regard to the 9, 10 and 11 miles per hour north-east wind, you envisage an average position of a light varying breeze during that time? A. One would say it could vary between 5 and 15.

40

Q. Even if it did, it could be fairly described as a light varying breeze during that time?
A. A varying breeze - I am not familiar with the Beaufort scale, but I would agree with that, yes.

Q. And of course, during that two or three hours - you have been, you say, into Mort Bay?

A. I have seen the Sheerlegs.

Q. - You would expect a constant movement of the water, to a certain degree? A. To a certain degree.

MR. MEARES: There can be no issue about this.

(Short adjournment).

MR. ASH: Q. Turn to your tests again. There is one isolated matter, in Exhibit "1"(15)?

A. Yes.

10 Q. I put it to you that this was the position in regard to that, that the fact that it did not ignite was due to the fact that by chance, no pieces of molten metal from the electric arc welder landed on that cotton waste. Would you accept that as the position? A. Not unequivocally. It could have gone through. That sample is only half the weight of the others, but it was spread out to the same area.

20 Q. You would agree with me that that could have happened? A. Yes, that could have happened.

Q. I am not suggesting that there was anything misleading in the document, but if that were the case, that no spark hit it, in its tabulated form there, it could give a wrong impression?

A. It could give a wrong impression. On the other hand, a spark could ignite that if it had hit the cotton waste. It was just as likely to ignite it as the other ones.

30 HIS HONOUR: Q. But it is possible, I suppose, that a spark could have hit it and yet it did not ignite. Would that be right?

A. It could have it actually onto the waste?

Q. Yes. A. The evidence does not support that.

Q. You mean because of the other results, that is unlikely? A. Yes.

40 MR. ASH: Q. On another isolated point, dealing with this word "inflammable", would you agree with this statement, that any combustible liquid when heated above its flash point, will produce flammable vapours? I suppose you will agree with that? A. Yes.

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

Q. And would you agree with the following that, for example, heavy fuel oil, when heated above 300 degrees Fahrenheit, may release vapours as flammable as those of gasoline at its flash point temperature, which is less than 100 degrees Fahrenheit? A. I cannot speak of that experience. I have never done that. I think the chances are yes.

Q. The heat of a flame is of the order of 1,000 degrees Fahrenheit? A. Some flames, yes. 10

Q. An ordinary flame such as we have been talking about, flame burning with cotton waste on oil - of that order? A. Of that order.

Q. All I am putting to you - it is only a matter of terms - is that once you get a flame like that in the area adjacent to oil, and the flame remains, I think you could then say, in that position, that the oil is highly inflammable?

MR. MEARES: I submit this is a matter of common sense, and for Your Honor. There would be no dispute between us about this. Obviously, if you get it to a certain heat, it goes off. 20

HIS HONOUR: However, there is a real dispute, of course, as to the probability or otherwise of the flame which, let us say, is 1,000 degrees Fahrenheit, heating adjacent oil to the required temperature to make it ignite?

MR. MEARES: Yes.

HIS HONOUR: There is a real dispute about that, of course? 30

MR. MEARES: Yes.

MR. ASH: Q. On that, when I was speaking of a flame this morning, an established flame coming from a bit of oily cotton waste floating on water, it would be fair to say that that flame would probably be of the order of 1,000 degrees Fahrenheit? A. It would be less, I think, that type of flame.

Q. Well, it would be well over 750 degrees? A. I would think so, yes. I have not measured them. 40

Q. I think you would agree that you have known for a long time that cotton waste would burn? A. Under certain circumstances, yes, cotton waste will burn.

Q. First of all, it has to be lit? A. Yes.

Q. If lit, it will burn? A. Yes.

Q. And that it would burn more assuredly if it has some oil in it? A. Yes.

Q. You have known both those facts for a long time? A. Yes.

Q. And you have also known that it can be lit if an object of sufficient temperature is applied to it? A. Not only sufficient temperature, but containing sufficient heat, yes.

Q. You have known that for a long time? A. Yes.

HIS HONOUR: Q. When you make that distinction between the temperature of the object and its heat, do you have in mind that if you have two objects which have the same temperature, they may have different heats? A. That is quite correct.

Q. Would that be according to their size or according to the material in the two objects, or what? A. It will depend on three factors - the size of the object, the temperature at which it is and -

Q. I was assumming a constant temperature. A. Yes, and an inherent property of the material. Some materials can hold more heat than others.

MR. ASH: Q. You know, of course, that sparks from oxy torches or electric welders fulfil all three requirements when it comes to igniting a piece of cotton waste? A. They will ignite cotton waste. It is possible that they can ignite cotton waste.

Q. They can ignite cotton waste? A. Yes.

Q. And you have known that fact for a long time? A. Yes.

Q. Just on one thing I asked you yesterday: I think you agreed with me that some vapours come off oil, if left on water?

MR. MEARES: He did say that. "Infinitesimal" was his word.

MR. ASH: Q. And the danger from them, any fire danger, would depend on a number of factors, would not it? A. Quite a number of factors, yes.

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

Q. You said yesterday that in your views, under that wharf, there would not be a build-up of dangerous vapours, for reasons you gave?

A. That is my opinion.

Q. By dangerous, you meant inflammable? (No answer).

Q. Fire danger? A. Yes, a concentration of vapours sufficiently high to be ignited. I did not think -

Q. As vapours? A. Yes, as vapours. 10

Q. Initially as vapours - that is what you meant? A. Yes.

Q. By "initially", by a hot object coming in contact with them, as vapours - that is what you meant - such as molten metal and things like that? A. Meaning that the -

Q. That the vapours themselves - A. Would not be there before the hot metal came down. The hot metal is capable of producing vapours once it hits the oil. 20

Q. It is capable of producing vapours once it hits the oil but it would not, in that path, ignite the vapours itself, the hot metal; it would not itself ignite the vapours during its path to the oil? A. Well, there would not be enough vapours there.

Q. But that is what you meant when you gave evidence about the build-up of vapours underneath the wharf? A. Yes.

HIS HONOUR: Perhaps it is not correct to say that is what he meant, but that would be one thing which would be involved in what he said. 30

MR. ASH: Q. What you said was, having dealt with draught under a wharf and distillation range of flash point 170 furnace oil, that there would not be enough heat exchange on the atmosphere to vaporise sufficient of the oil to build up a dangerous concentration? A. That is what I said, yes.

Q. You meant such a concentration as could be ignited by falling metals, did you? A. Yes. May I postulate two classes - the very unusual one of your metal in all respects, take the pieces of molten metal dropping from a height, going through the oil and igniting it. Then 40

can we imagine an exactly similar piece of metal falling onto an exactly similar film of oil and stopping just above it?

Q. Yes. A. There would not be enough vapours present in that situation for the hot metal to ignite. It must produce some vapours itself by actually coming in contact with the oil.

10 Q. In other words, if it stopped short of the oil, a hypothetical distance short of the oil, the hot metal itself would not ignite the vapour itself in that condition? A. Yes.

Q. And you said, "Thirdly - this is pure supposition - one has to take into effect any sunlight which might be present." Then you said, "In other words, I cannot see that under the wharf such as you describe, there would be any chance whatsoever of a buildup of dangerous vapours." Do you follow? A. Yes.

20 Q. You mean that there would not be a build-up of vapours which could be ignited by a situation such as you have just described, where you drop the metal down and it stops short of the oil and ignites the vapour itself? You say it could not build up such a concentration as to allow of that situation? A. That is what I meant.

RE-EXAMINATION

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Cross-
examination
continued

Re-examination

30 MR.MEARES: Q. You will recall at page 334 of the transcript you were asked a question as to whether you had made a search for the purposes of ascertaining whether there was any literature on the happenings of fires on fuel oil on water. You have given evidence of the search you made for that particular matter? A. Yes.

Q. And through the index? A. Yes.

40 Q. In addition to the question of occurrences of fires through fuel on water, are you, or are you not, aware that since this case has been on and before it, and before the first case before Mr. Justice Kinsella, Professor Hunter had been searching for literature dealing with fire precautions? A. Yes, I am aware of that.

Q. And you are aware of the existence of certain literature on that subject? A. Yes.

Q. And you have read it? A. Some of it.

Q. But your search was simply a search of this

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Re-examination
continued

particular subject, namely the occurrence of fires? A. Yes.

Q. And you limited your search to that?
A. Very severely.

Q. And at that time of course you were aware that Professor Hunter had collected quite a bit of literature on the other topic that I have mentioned? A. Yes.

Q. Did you reach a conclusion as to what were suitable winds to bend a flame down in the circumstances of this case, before or after knowing what the wind velocity was on the day in question? If you cannot answer, say so. A. I think I knew the wind velocity at the time of the occurrence.

10

Q. You were asked, as far as Exhibit 19 was concerned, as to whether or not you had made a test of the inflammability of oil under certain circumstances of 1/16th of an inch, and you will recall that in that exhibit that the only test you made was with oil of a minimum thickness of 1/8th of an inch, the test being the result of cotton waste ignition upon oil on water. Would you tell me why you did not make any test of the oil 1/16th of an inch in thickness?

20

MR.ASH: My reason of the other results with 1/16th of an inch, he did not think it was worth while in this one.

MR.MEARES: Q. Have you conducted any tests with oil on water and a wick on the oil alight, in which the wick has gone out before all the oil has been consumed. A. Yes.

30

MR.ASH: This is, in a sense, new matter.

MR.MEARES: Your Honour posed a problem in which I am interested.

HIS HONOUR: I will allow it.

MR.MEARES: Q. Does a wick burning in oil produce carbon, charcoally looking stuff? A. From the wick or from the oil?

Q. From anywhere? A. Yes, ultimately it does. 40

Q. If it is burning for a long time does its capacity as a wick decrease or increase?
A. It decreases.

Q. Imagine a wick in a kerosene lamp which had

in it fuel oil, but not kerosene, and it did not have the protector in on the top of the bowl?

A. It did not have a protector?

Q. No. Imagine it is distance X above the fuel oil and it is slowly eating away the fuel oil and decreasing in efficiency because of this deposit on it. Supposing it got smaller and smaller and smaller above the kerosene until eventually it caught on to the kerosene. A. The wick actual-
10 ly burns down level with the kerosene?

Q. Not kerosene, with the level of the fuel oil?

A. Yes.

Q. What would happen then? Or don't you know?

A. I do not know definitely. Well, only two things can happen. The flame will go out or it will continue to burn. One would have to know all the conditions; I cannot answer that ques-
tion definitely.

Q. Would this put it fairly to you? Under
20 certain circumstances, depending upon the size and efficiency of the wick, before consuming all the oil in which it rested it could, when it burnt down to the oil edge, by that method alone, cause the oil to light. A. You are only considering fuel oil now; you have not got water underneath it?

Q. Yes, I have to put water underneath it. Imagine a piece of cotton waste on fuel oil a quarter of an inch or half an inch thick.

30 MR.ASH: Cotton waste?

MR.MEARES: Q. A very suitable wick, and imagine it on oil under the circumstances you envisage under the sheer legs, and imagine it burning and burning until eventually the wick is just literally level with the oil. Under those circumstances if the wick were large enough, would the probab-
ility be it would catch the oil alight?

MR.ASH: I do not follow what my friend is putting. He started off with the type of wick one sees in a
40 lamp.

MR.MEARES: I abandoned that.

MR.ASH: I got the picture of a long thin piece of materials; now he takes cotton waste floating on water and when it burnt down and the flame reaches the level of the water. One concept seems to belong to the long wick.

Defendants
Evidence

No.25

H.H.S.Parker

15th February
1963

Re-examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Re-examination
continued

HIS HONOUR: I understand Mr.Meares has now left his illustration of the type of wick which one has in a domestic lamp, and has gone to the type of wick that has been talked about in this case, that is cotton waste or the like floating on the water. The question is if that wick burns down to the level of the fuel oil, what will happen?

WITNESS: I have done experiments along those lines. I cannot say what will happen in every case, but in some cases the wick went out quite definitely.

10

MR.MEARES: In some cases did it catch the oil alight? A. In some cases it caught the oil alight.

Q. May I assume the probabilities would be of course dependent upon what had been going on in relation to heating up the oil around it before the wick got to that stage, and also as to the size of the wick? A. Yes, it would depend on that.

20

HIS HONOUR: Q. It had occurred to me that we non-scientific people may be likely to mislead ourselves by the use of this term "wick". Some of us, including myself, have had a lot of experience with the ordinary type of domestic lamp to which Mr.Meares referred, and have literally burned the midnight oil and not the electric light. That of course is called a wick, but that is a situation where you have a relatively thick piece of material, a relatively small piece of material up above the oil surface and kept up above the oil surface, and such a wick will enable oil to burn for a long time without the wick itself being consumed by fire. That is common experience, because a lamp wick will last quite a considerable time. Do you follow that? A. Yes.

30

Q. I am wondering whether the sort of wick that has been talked about in this case is really comparable to that at all, or whether it is quite different. Let us suppose, to start with, that you have a quite large piece of material - we will stick to the cotton waste - but let us say it is a yard in diameter and there it is on top of the water which has oil on it? A. Of any particular thickness?

40

Q. The cotton waste you mean? A. Yes.

Q. I will not postulate thickness at the moment, but you have this large piece of cotton waste which has fallen, or has been thrown on to water on which there is oil. Let us suppose that by some means you set fire to the cotton waste so that it is not merely smouldering, but burning? A. Yes.

10 Q. Suppose also that either by previous treatment or by being close to the oil it has to some extent, or some degree, become impregnated with oil? A. Yes.

Q. Can you tell me whether such a flame on such a piece of material - remember I postulated a very big one - A. Yes.

20 Q. - is likely to burn the cotton waste so that it burns down close to the level of the oil, or whether it is likely just to go on burning oil without consuming the cotton waste itself, except to a very small degree. Do I make myself clear as to the problem? A. I understand your question, and providing the flame on this cotton wick system continues in existence for a sufficient length of time, then a small amount of wick material will be burnt away and ultimately, if the cotton waste were above the level of the oil to start with, it would reduce in height and come down closer to the surface of the oil, and usually when that happens the efficiency of the wick material - and I might point out that the

30 material of which ordinary domestic wicks are made and cotton waste is made are both cotton of a very similar type of material, and the efficiency of that cotton waste as a wick would be reduced. Does that answer Your Honour's question?

HIS HONOUR: It does in part; it answers the first stage as to whether this thing being postulated on burning down near the level of the oil will happen at all.

40 MR. MEARES: Q. The problem is associated with the question of the time factor in relation to the sinking of the wick? A. Yes.

HIS HONOUR: Q. Would you agree, taking this very large piece of material that I have been talking about, and you assume it does keep burning for a considerable length of time and does

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Re-examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Re-examination
continued

burn down near to the level of the oil, I take it that it would be likely to cause a sufficient vaporising of the oil around it to start a fire?
A. The chances are that it would.

Q. But the smaller your piece of waste is, the more that chance is reduced? A. Yes.

Q. And there would be other factors to take into account? A. There are definitely a number of other factors.

MR.MEARES: Q. Mr.Ash asked you some questions about vapor under the sheerlegs wharf in relation to coals burning and coke burning and being alight and dropped - 10

MR.ASH: The only reference to coke was in Exhibit 9.

MR.MEARES: You asked this witness as to the effect. I will withdraw the question.

Q. Mr.Ash asked you to consider the problem as to whether any vapors that could have been under this wharf would have tended to increase the fire risk if a burning piece of coke had been dropped. Do you recall that? A. Yes. 20

Q. As far as any question of vapor under this wharf at the time of the fire was concerned, caused by any reason at all, in your opinion is this, or is it not, a factor worth considering on the question as to whether or not it increased, to any worthwhile extent, the fire hazard generally? A. One must make a point of reference there, I am afraid, and if we consider the state of matters under the wharf up to the point when this hypothetical type of wick starts smouldering or whether it bursts into flame, if we may consider up to that point I do not think there is any chance of any concentration of vapors being under that wharf that would increase the risk of fire. 30

Q. You told Mr.Ash that the bending of a flame of a wick around the "Corrimal" on this day was not in your opinion 100 per cent. essential to cause the fire from a wick? A. The bending of a flame around the "Corrimal"? 40

Q. Leave out the "Corrimal". If you have a wick floating in the Harbour and it catches alight, one way of causing the oil to ignite is

if the flame bends down? A. Yes.

B. But you said, did you not, that this feature of it bending down was not 100 per cent essential to cause fire? A. Not 100 per cent essential.

10 Q. Would it be correct to say that the movement of the waters with a lighted wick on them would, to some extent, increase the fire risk compared with that condition of the waters being perfectly still? To some extent? A. To some very small extent, Yes, I agree with that.

Q. On this question of not being 100 per cent essential, can you postulate the conditions under which it would not be essential?

A. The bending of the flame?

Q. Yes? A. You would have to have a large wick, well lighted, well alight, and preferably an irregular shaped wick.

20 Q. May I put it to you that if the wick were large enough then you would get a greater radiant heat. A. Yes.

Q. Then you stated, I think, in terms that the heat of a wick on oil in water peripherally vaporises the oil - I may be wrong; but on the assumption you made that statement, were you referring to a lit wick of any sort without wind, or to a lit wick of particular sort, with or without wind.

30 MR.ASH: I postulated a still condition to differentiate.

HIS HONOUR: Q. I will allow it.

MR.MEARES: Q. Upon the assumption that you stated that the heat on the wick peripherally vaporises the oil on the water in the Harbour, are you postulating that it peripherally vaporises the oil irrespective of the stillness of the air or the size of the wick or not?

A. It will tend to vaporise the oil in a very small degree.

40 MR.ASH: Your Honour has twice adverted to this wick burning down to the water, and I thought I had covered the matter in my cross-examination, but my friend has put it again.

Q. On this question of the cotton waste catching alight and burning on the oily water, you

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Re-examination
continued

Defendants
Evidence

No.25

H.H.S.Parker
15th February
1963

Re-examination
continued

said that in some cases it would burn down to the level of the oil water and go out in some cases? A. Yes.

Q. But the greater probability would be when it got there it would ignite the oil. A. No, I did not say the greater probability.

HIS HONOUR: Q. If it is a large one, under certain conditions is it a greater one?

A. If one takes wicks of a certain size there is a certain probability, and if you take bigger wicks there is more chance of the oil becoming ignited when the wick burned down to the level of the oil.,

10

MR.ASH: Q. Take a 20 gramme piece? A. I could not answer that because I have not done enough tests.

Q. You recall that you said to His Honour that a number of other conditions come into into the situation? A. Yes.

Q. I put some conditions to you and I want to make sure those are some of the conditions that came into the situation. First of all the lateral expanse of the oil? A. Yes.

20

Q. The thickness of the oil? A. Yes.

Q. Wind? A. Yes.

Q. To a lesser degree, movement of the water? A. Yes.

Q. And to a somewhat lesser extent containment? A. Yes.

Q. Each of those five things would, if present, all lean towards the situation where the cotton waste continued to burn on the oil rather than going out when it burnt down? A. It is a matter of degree.

30

Q. In general each of them would tend to lead to that situation? A. Yes.

Q. On that matter also you agreed with me that the burning piece of cotton waste that we are speaking of, once ignited, and the light, the ordinary wick of the lamp His Honour described, tends to absorb the oil? A. Yes.

40

Q. The heat of the flame tends to vaporise the oil immediately around the wick? A. Yes.

(Witness retired)

No.26

EVIDENCE OF T.G.HUNTER

THOMAS GIRVAN HUNTER
Sworn, examined as under:

Defendants
Evidence

No.26

MR. MEARES: What is your full name?

A. Thomas Girvan Hunter.

T.G. Hunter

15th February
1963

Q. You are an Associate of the Royal Technical College of England, in Technical Chemistry?

A. A Diplomat in chemistry of the Royal Technical College, Glasgow.

Examination

10 Q. You are a Bachelor of Science of Oil Engineering and Refining of the University of Birmingham? A. That is correct.

Q. And you have a Degree of Philosophy of the University of Birmingham? A. I hold the Degree of Doctor of Philosophy.

Q. Did you write a thesis? A. For the Doctorate, Yes.

Q. With what was that in connection? A. On the refining of lubricating oil.

20 Q. You are a Doctor of Science in addition at the University of Birmingham? A. Also in Petroleum Engineering and Refining.

Q. Which is a Degree above the Ph.D? A. Yes. I had some 48 published papers.

Q. You are a Member of the Institute of Chemical Engineers? A. Yes.

Q. A Fellow of the Royal Australian Chemical Institute? A. Yes.

30 Q. And a Fellow of the Institute of Petroleum? A. Yes.

Q. Is that an English Organisation? A. Yes.

Q. And the Fellowship there - is that a degree? A. It is the highest graded membership.

Q. Between 1926 and 1927 - would 1926 have been roughly when you made your debut?

40 A. Yes, in 1926 I was at the Royal Naval College, in the Department of Fuel and Metallurgy, working with the Professor of Fuel and Metallurgy, who was an adviser to the Home Office on Petroleum, as well.

Defendants
Evidence

No.26

T.G. Hunter
15th February
1963

Examination
continued

Q. You were there in the capacity of a research assistant? A. Yes.

Q. On what subject were you doing research on gasoline, on petrol.

Q. From 1927 to 1931 you were the plant and refinery manager at Imperial Chemical Industries Plant at Willington on Thames? A. No. at the plant at Billington on Tees.

Q. Was this plant a plant designed for the purpose of manufacturing oil from coal?
A. Yes.

10

Q. Did it include in the plant storage facilities? A. Storage and refining for the products, and I was the manager of the refinery.

Q. As far as storage was concerned, were there large storage tanks of oils and various stores?
A. Fairly large storage tanks of oils of all kinds.

HIS HONOUR: Q. Of all kinds? Not restricted to oil derived from coal? A. All kinds of fraction of oil derived from coal - gasoline and kerosene and so on.

20

MR.MEARES: Q. From 1931 to 1947 you were the Senior Lecturer in the Department of Petroleum Engineering and Refining at the University of Birmingham? A. That is correct.

Q. For some years you were Consultant to the Anglo-Iranian Oil Company? A. Yes, for about nine years.

Q. As what? A. I advised and helped in the training of all the Iranian students who came to England to be trained for the oil industry.

30

Q. Would the training for the oil industry involve the training of men for the purpose of superintending terminal stores and oil stores?
A. That sort of thing, and in the operation and management of oil refineries.

Q. I think you were a Consultant on Petroleum Explosives to the Birmingham Police? A. I helped set up a Petroleum and Explosives Dept. in the Birmingham Police and trained the first personnel.

40

Q. I think you were the editor of a publication running into some four volumes - four million words - called "The Science of Petroleum"

Oxford University Press? A. I was editor for some time during the illness of my Professor at Birmingham, and was virtually responsible for this, which could be described as an Encyclopedia of Petroleum.

Defendants
Evidence

—————
No.26

T.G. Hunter
15th February
1963

Examination
continued

10

Q. During the war for some four years were you engaged in the Ministry of Aircraft Production, in London, in connection with the problems of flame throwing and incendiary bombs and fuel barriers? A. I was taken out of the Royal Engineers in which I was holding a Commission, and seconded to this work of the Petroleum Warfare Department of the Ministry of Aircraft Production, and Birmingham University. I was the second senior member of the team which handled these matters, and we developed such things as flame-throwers, incendiary bombs, oil bombs for military bombing, and we liaised with the U.S. Army Forces when they entered the war, and they adopted our ideas and developed their own modified incendiary bombs which successfully burnt down 63 Japanese cities.

20

30

Q. In connection with your duties during the war were you also interested in and concerned, in a liaison way, with the problem that the other branch of this organisation you were in was dealing with, of endeavouring to light oil on the Channel as a defensive measure in the event of an invasion? A. Another section of the Petroleum Warfare Department was working on the South Coast, setting up what we called flame-barrages around the English Coast, to prevent landing of troops during an invasion. They consisted of nozzles set along the coast which were fed with fuel oil and set on fire should an invasion take place. In addition to that they had installations which pumped a great deal of fuel oil on to the sea where a thin film of oil was formed, and then they had to ignite it from the air. We naturally had frequent conferences, saw each other's reports and frequently discussed our mutual problems.

40

Q. In what way were they trying to ignite it from the air? A. It was very difficult to ignite indeed. Eventually, with various things like dropping petrol on it and then dropping sodium pellets which, when they hit water caught fire - that was tried and it did not work very well. The finest method was dropping a Naval

Defendants
Evidence

No.26

T.G. Hunter
15th February
1963
Examination
continued

type flare which, when it hit the water remained as a wick and remained flaring on the surface of the oil. The thing was so chancy that they eventually had to give it up.

Q. May I put to you that ever since you left the University you have been actively concerned with problems relating to oil its characteristics, its inflammability, its combustibility and its various qualities? A. Particularly oil fires, explosions and the ignitability and inflammability of oil rather than its utilisation in industry. 10

Q. I think since 1947 you have been the Professor of Chemistry? A. Chemical Engineering.

Q. At the University of Sydney, and you are head of the Chemical Engineering Department within the University? A. That is correct.

HIS HONOUR: That is in the Faculty of Engineering? A. Yes.

Q. It is not within that of Science? A. No.

MR.MEARES: Q. Mr.Parker is one of your assistants? A. He is one of my staff. 20

Q. I think you have searched, yourself, with assistance from the Fisher Library for literature dealing with the problem of lighting oil on water? A. Yes.

Q. Not tests? You have made a search for literature? A. We have made an exhaustive literature search of all aspects of this subject.

Q. Have you obtained certain literature from different sources, such as C.S. I.R.O. and elsewhere? A. On the subject of oil catching fire on water? 30

Q. Yes? A. There is practically nothing in the literature on this.

Q. Have you also made a search in relation to precautions that are taken in relation to fuel oil and other oils? A. Before answering that could I add a bit to my previous answer? When I said there is practically nothing in the literature on the subject of oil burning in water, with the exception of one paper which was published by the Fire Research Board, Great Britain in 1959. 40

Q. Would you now answer my question? A. I have also carried out a very exhaustive search on the

hazards and safety precautions of handling inflammable and combustible liquids.

Q. Has that search involved endeavouring to ascertain the contents of papers and have you had references which are only situated in Victoria and Western Australia? A. Yes. I have been unable to get a number of the works dealing with this, because they are in other States.

10 Q. Have you additionally concerned yourself with the particular problem of the Mort's Dock fire? A. Yes.

20 Q. I think you have given evidence before Mr. Justice Kinsella in this case and prior to giving evidence in that case I think you did a very large number of tests in which Mr. Parker was mainly the active agent, but which were seen by you. A. I initiated and organised what was virtually a research project into this matter and we finally finished up with carrying out more than 500 tests.

Q. I think it is fair to say that some of those tests included in the initial case were tests relating to petrol? A. Quite a number were related to petrol and on water, and petrol-fuel oil mixtures on water.

30 Q. Within the last month I think you initiated and have seen the results of some further tests? A. Yes, we have carried out some further tests and learned a bit more about this subject.

Q. Did you know prior to 1951 of the "Panamanian" fire? A. I did not know of that fire until 1956 or 1957.

HIS HONOUR: Q. When did you come to this country? A. In 1947.

MR. MEARES: Q. Did you hear of the Mort's Dock fire or read of it? A. No.

40 Q. I mean shortly after it? A. Not to my recollection.

Q. Does your reading involve journals related to your speciality of oil, and its characteristics and so on? A. Yes, quite extensive reading on these matters and fires from oil and similar material.

Defendants
Evidence

No.26

T.G. Hunter

15th February
1963

Examination
continued

Defendants
Evidence

No.26

T.G. Hunter
15th February
1963
Examination
continued

Q. When you were with I.C.I. or at any time prior to your experiments, had you even seen fuel oil ignited other than deliberately?

A. Yes, I have. Oil similar in nature to fuel oil - it would not be specifically fuel oil.

Q. Under what circumstances? A. In circumstances of an accident which had arisen on an industrial plant; the oil was at a very, very high temperature.

Q. What was the nature of the accident?
A. In one particular instance it looked as though the plant was going to explode, and we had to get rid of all the oil in it - we were working at a very high pressure by blowing this stuff down into a huge pit, and it was at such a high pressure that as soon as it came in contact with the open air it immediately caught fire.

10

Q. Where was this? A. Billington-on-Tees.

Q. Any other cases? A. There were minor things of that nature.

20

Q. In the actual process of burning oil?
A. Not in the process of burning oil, but in the process of converting coal into oil.

Q. Have you made an inspection of the Mort's Bay area, and particularly of the sheer legs wharf? A. Yes, I inspected it, I think, on September 25th 1957 at 3.30 to 4 in the afternoon, half an hour after low tide.

Q. What year? A. 1957 I think.

Q. What did you observe? A. I made a special note at the time that there were 48 piles under the wharf; that they were, most of them, covered from low water mark to high water mark with an oily deposit. There was a great deal of rope hanging in festoons; There were a lot of motor car tyres, I presume acting as fenders, and the whole place looked particularly oily and unpleasant.

30

Q. Did you notice whether the piles were smooth or barky? A. Two piles in every five were covered with bark.

40

Q. Between high and low water? A. Between half an hour after low tide, so it would be virtually between high tide mark and low tide mark.

Q. You have been told; and in truth you have read, have you not, the evidence that was given in the Mort's Dock case before Mr. Justice Kinsella? A. I have.

Defendants
Evidence

—
No.26

Q. And you were aware of the flash point of the oil used, and of the circumstances of its spillage, including the time of spillage, and you have read the evidence relating to the spread of the oil?

T.G. Hunter
15th February
1963

Examination
continued

10 A. I have.

Q. You have read the evidence relating to the industrial operations that were going on on the sheerlegs wharf, and of the occurrence of the fire and the damage caused.

A. Yes.

Q. I want you to assume that this fire had as its activating agent a wick floating in the vicinity of the sheer legs wharf?

A. Yes.

20 Q. And to assume the probability of the wick being of something in the nature of cotton waste or of some similar substance?

A. Yes.

Q. You would assume, from what you have read of the evidence that there was a very substantial spillage of fuel oil?

A. The evidence would suggest that.

30 Q. Are you able to speak at all as to whether or no the combustible properties of fuel oil on water, in a harbour spillage as this oil was, will vary or not under any circumstances with time?

A. I think they could vary with time.

Defendants
Evidence

No.26

T.G. Hunter
15th February
1963

Examination
continued

Q. Would you tell me why you say that and what is the source of your reasons for saying it?

A. I would refer you to the Ministry of Transport (Objected to).

HIS HONOUR: Perhaps we had better get the witness to give his own opinion without stating the materials on which he formed it.

MR.MEARES: Q. Would you give us your opinion?

A. In my opinion fuel oil floating about on water for several days could thicken up and emulsify with water, and I think you would get an emulsion with up to 35 per cent of water in it, or some such figure approaching that, which would considerably decrease its combustible properties.

10

Q. On what grounds do you base that conclusion?

A. On the evidence that is available to me from the scientific literature, and on several experiments which I have carried out or caused to be carried out.

20

Q. Have you any scientific knowledge of the manner in which fuel oil - and when I speak of fuel oil, from now on I speak of fuel oil of a flashpoint of about 170 degrees used for sea bunkering, - spreading on harbour waters?

A. Yes.

Q. I want you to assume conditions which you have read of in the Mort's Bay area. You are aware of wind velocities?

30

A. Yes.

Q. And you are aware of tides and I think you are aware of the fact that the end of the bay has been described as being a dead-end in effect?

A. Yes.

Q. And I think you can assume that generally speaking the tidal effects would be stronger in the bay rather than around the edges. I think Mr.Ash will agree with that?

A. Yes.

40

MR.ASH: I did not say I agreed with that.

MR. MEARES: Q. Generally speaking in a bay or anywhere else you will get the main flow of your tide in the centre, and lessening around the edges.

Defendants
Evidence

No.26

MR. ASH: I will accept that.

T.G. Hunter

MR. MEARES: Q. Will you discuss the question of probable thickness of the oil and as to whether anything could persuade it to become thicker or alternatively thinner?

15th February
1963

Examination
continued

10 A. Under the conditions you have described the fuel oil would be floating freely on sea water and would, I am sure, reach what I would call an equilibrium thickness. There would be gravity acting on it, buoyancy acting on it and in another way surface tension effects, and eventually they would all balance out and you would finish up with a layer of oil which would have attained equilibrium among these various forces, and hence have a definite thick-
20 ness, and from the experiments which I have carried out with this oil on sea water, I put that thickness - it is varying, it is difficult to make these measurements - at between 1/25th of an inch and 1/8th of an inch.

30 Q. We know that launches and ferries use the bay where the oil possibly was, and in the bay there must be necessity at varying times, and possibly always, be some debris - its extent is another matter - and in the bay there are launches and shores and piles. Do you think that anything in that bay would tend to thicken the oil at any particular point - there are also ships alongside the wharves? A. These things you are describing would to some extent contaminate the waters of the bay and that would have an effect of either thickening or thinning of this oil layer.

40 Q. Supposing you had a ship alongside the Mort's Dock Company's sheer leg wharf, which was I think some 680 feet long - of approximately 230 feet length, lying out, as a result of fenders, some few feet and suppose you also envisage that at some time, if not always, there was a quite definite tendency for the main body of the oil to have been in an area arrived at by drawing a rough line from the Mort's Bay Dry

Defendants
Evidence

No.26

T.G. Hunter

15th February
1963

Examination
continued

Dock, the joiners wharf, across, generally speaking, towards the sheer legs wharf. A. Yes.

Q. In truth, I think the evidence establishes that at the time of this occurrence there was little or no oil on the starboard side of the "Corrimal" which was lying to the portside of the wharf? A. Yes.

Q. And that the oil was underneath the sheer legs wharf and out to the portside of the "Corrimal"? A. Yes.

10

Q. Knowing the facts as they related to the initial spillage and the movement of the oil around and assuming that the oil was not only there, but it was elsewhere, and that it moved about over weeks, do you think that its thickness from the portside of the "Corrimal" into the shore under the sheer legs wharf would be thicker or thinner, or the same as this minimum or maximum thickness that you postulate (Objected to).

MR.ASH: There are so many factors, and the main one is the volume of the oil spilled. It would require in the Professor also a more detailed knowledge of tides and winds than he has in that particular department and it would be pure guess-work.

20

HIS HONOUR: If the Professor feels he can express an opinion about it, I will admit it.

MR.MEARES: Q. Have you any view about the matter? A. A very strong view. I think the thickness would be of the same thickness on each side of the "Corrimal" and it would be within 10 or 20 per cent of that equilibrium thickness I have discussed. You must attain this equilibrium thickness; any effect of contaminants in either thickening or thinning that film will be over a minimum area; it will be a minor effect and it will be less than 10 or 20 per cent, and, compared with the waves or shelter of the "Corrimal" that would be absolutely negligible.

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(FURTHER HEARING ADJOURNED UNTIL MONDAY,
18TH FEBRUARY, 1963).

40

IN COMMERCIAL CAUSESNos.3000 & 3001 of 1956CORAM: WALSH J.

THE MILLER STEAMSHIP CO. PTY. LIMITED -v- VACUUM OIL CO. PTY LTD. CALTEX OIL (AUST.) PTY. LIMITED and OVERSEAS TANKSHIPS (U.K.) LIMITED.

R.W. MILLER & CO. PTY. LIMITED -v- SAME.NINTH DAY - MONDAY, 18TH FEBRUARY, 1963

THOMAS GIRVAN HUNTER
Examination contd:

- 10 MR. MEARES: Q. You are on your former oath. You expressed the view on Friday last, that the thickness of the oil on either side of the "Corrimal" would be within 10 to 20% of the equilibrium thickness you had discussed, and that the effect of contaminants in either thickening or thinning the film would be over a minimum area, that it would be a minor effect and less than 10 or 20%. (To His Honor): I think that the last question should read "any effect of contaminants".
- Defendant's
Evidence
No.26.
T.G. Hunter
18th February,
1963.
- 20 HIS HONOR: Yes.
- Examination
continued.
- MR. MEARES: Q. First of all, have you given some substantial consideration to this problem since the hearing of the action brought by Morts Dock against the present defendant, before Kinsella J? A. Yes, I have given it a lot more thought.
- Q. Is this a problem, substantially speaking, of surface chemistry? A. No. I think that is a minor effect. The equilibrium film thickening -
- 30 Q. Scientifically, is this a problem for the surface chemist? A. The equilibrium thickness and the effect of contaminants on that is a problem for the surface chemist.
- Q. And have you had certain tests conducted by a surface chemist? A. I have.
- Q. Have you considered the problem with that surface chemist, and have you also considered the results of the tests? A. I have done both.
- Q. So far as any contaminants are concerned -
- 40 MR. ASH: I do not know whether this is the content of another man's research. I object to the contents of the results of tests being got in without the person who performed them being called. (Pressed: argued).

Defendant's
Evidence

No. 26.

T.G. Hunter

18th February,
1963.

Examination
continued.

Q. MR. MEARES: So far as contaminants are concerned, have you considered types of contaminants which could possibly cause a thickening? (Objected to; allowed). A. Yes, I have.

Q. Have you any view as to whether any contaminants that you have considered as being things which may conceivably be in the harbour, would materially cause any thickening of oil spilled in the manner we have heard about in this case? (Objected to).

HIS HONOR: Q. Is this view based on these tests we have just heard about? A. I think it is, yes. 10

(Evidence rejected).

MR. MEARES: A. Have you given consideration to the question of the thickening of furnaceoil on water?

A. Do you mean -

Q. I mean precisely what I say. A. Equilibrium thickening or any other type of thickening?

Q. Any other type, including equilibrium? A. I have.

MR. ASH: If my friend assures me none of the questions he is about to ask are based on opinions sought, I will not object. 20

MR. MEARES: Q. I think you gave considerable thought to this matter, did you not, over the weekend? A. I spent most of Saturday and Sunday thinking and reading.

Q. And you reached the conclusions concerning the matter yourself? A. I have, entirely alone.

Q. And did you write out your views? A. To the extent of four or five quarto pages. 30

Q. Might I handthese to you, and with His Honor's permission, you may refer to them. Would you express to us your views? (Mr. Ash consents) A. I started off by considering that most furnace oils are what are known in the petroleum industry as residual oils, that is, they are left behind in the refining process, as a residue, when the more volatile constituents of crude petroleum are removed as a distillate. That residue which is left is most frequently used as a fuel oil and usually a furnace fuel oil, and it has dissolved in it a certain amount of asphaltic materials, whilst its common name is an asphaltic base fuel oil. This heavy furnace oil material containing asphalt, like every other petroleum product, reacts at atmospheric 40

temperature, with atmospheric oxygen. The end products of this reaction are quite clear from every type of petroleum product that reacts with atmospheric oxygen. We also get the same end-products, namely lacquers, gums and asphalts, and these are thick semi-solids and even solids. We even get the same phenomenon in petrol. The rate of that oxidation is directly proportional to the surface area exposed to the air, and it is accelerated by sunlight and by certain metals. So that is quite obvious, I think, from fundamental considerations, that furnace oil, which after all is no different to any other petroleum fraction, after exposure to air for a few days would tend to thicken up, because these thick gummy asphaltic materials form inside it and the net effect is to increase the viscosity, the thickness and the stickiness of the fuel oil. I feel that a spill of furnace oil on water, like we have had in this case -

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20

30

Q. Incidentally, this was an asphaltic oil? A. An asphaltic base oil. This offers favourable conditions for this to take place, because of the big surface area between the spilled oil and the atmospheric oxygen. Therefore we can count on the asphaltic content of this fuel oil being considerably increased by exposure to air as a thin film on sea water. The final product is going to be a fuel oil containing an amount of asphaltic material and that material is going to be just as inflammable and combustible as the asphalt surface of King Street, and the net effect on the fuel oil is to make it not completely non-inflammable, but completely non-combustible.

40

Q. That is, if you get a total conversion into asphalt? A. No. If you get a partial conversion into asphalt, I think the effect will still be the same, that the oil will be not only non-inflammable, as it was originally, but incombustible in bulk. I mean by that it would be incombustible if you were trying to burn a bulk quantity, but if you took it and forced it at high temperature, through a fuel oil burner, it would burn quite freely. But it is a different matter to burning the exposed surface of oil.

50

I also took another approach to this, and I know from my petroleum experience quite definitely that when furnace oil floats for three days on water, it tends to emulsify with the sea water. It emulsifies fairly readily and easily with sea water and the net result is the formation of a rubber-like emulsion. It appears to be nearly

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
1963.

Examination
continued.

Defendants
Evidence

No.26.

T.G. Hunter

18th February,
1963.

Examination
continued.

solid. It is thick, sticky, gummy looking stuff, and the emulsion contains up to 65% of water. I also feel that that phenomenon is likely to be accelerated by the oxidation of the fuel oil and that contains in consequence, asphaltic constituents, because these asphaltic bodies tend to emulsify rather easily. The road surface out here, I have no doubt was probably put on in the form of a cold emulsion, which is just a cold mixture of water and asphalt in the form of an emulsion.

10

I feel too, that the resultant emulsion - after all, it contains 65% of water - would be completely non-inflammable and non-combustible in bulk. Once again, I believe we could burn it in a burner. We know we can burn brown coal with 66% of water, coffee grounds after the coffee has been extracted, which contains 66% of water, but these are burnt in a special burner, and this material could not burn in bulk. I do not mean it is non-inflammable, but it could not even be burnt. It would not burn.

20

The resulting asphaltic oxidation products that you get from this atmospheric oxidation, are present in solution, in the fuel oil in this case, and like all these asphaltic and oxidation products, they tend to precipitate and settle out very easily. A case in point is gum out of petrol, settling on storage in motor cars. In this case we have the same effect, the precipitation of asphaltic components, and I think that wherever this oil containing these components came in contact with solid bodies, such as wharf pilings, rocks, shore lines, we would get them coated with this precipitated asphalt, I could call it. I feel that any of these deposits which so occurred, would appear as fairly thick deposits. They would not be thick deposits of fuel oil. They would be thick deposits of asphalt, and in addition, any emulsion effect which was formed would tend to deposit on the same shore lines, wharf pilings and rocks, and we would have then a deposit of asphalts, and a deposit of a watery fuel oil emulsion containing 65% water. Both these deposits would certainly have a flash point very much higher than the original flash point of 170, and, in my opinion, they would be non-flammable, and completely non-combustible.

30

40

Q. We can assume, I think, that the oil, or whatever you call it, between the Corrimal and the wharf and elsewhere, lit up? A. Undoubtedly.

50

Q. Would you relate that happening to the results of these two processes that you have described, operating on oil on an open harbour, over a course of a matter of 59 hours, and would you discuss in that connection as to whether this process would have reached its final stages on the one hand or whether, on the other, it would have simply increased the flashpoint?

Defendants
Evidence

No.26.

T.G. Hunter

18th February,
1963.

Examination
continued.

10 A. The material on the surface of the water between the wharf and the Corrimal would not have been floating asphalt or floating emulsion, otherwise it would not have burned. It must have been oil. At least portions of it must have been oil. I understand that considerable reports have been received that this oil -

20 Q. You cannot say that. Could you tell me your view as to whether the flash point of this oil that burnt on 1st November, was of the same flash point as the oil that was filled; whether it had increased or decreased, and if so, to what extent? A. If anything, it would have increased a little, but not much.

Q. Could you give us any idea of the percentage of increase? A. That would be beyond me.

Q. But you think, as you have said, that as far as the coatings of the shoreline and the piles are concerned, they would contain more asphalt than the oil on the water? A. More water -

30 HIS HONOUR: Q. Does that mean that, in your opinion, the two processes you have described had not proceeded very far in this case? A. I would not like to say what quantity of oil had taken part in these processes but that these processes had been going on I think must have been the case, because the shoreline and solid objects were definitely coated with what has been described as a thick coating of oil. It was a thick film of asphalt or emulsion.

40 MR. MEARES: Q. There has been some evidence given concerning bilges and fuel oil getting into bilges. What are your views concerning that?

A. No doubt fuel oil frequently gets into bilges and once it gets into the bilge it is there as a fuel oil-water emulsion.

Q. In your opinion, would this be a common or uncommon phenomenon? (Objected to).

Q. Have you had any experience at all, in any way, of bilges and what you can get inside them?

A. Only in small boats, not in large.

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
1963.

Examination
continued.

Q. In small boats, what is the position? A. The same thing, only it is usually lubricating oil and water that is emulsified. There is always an emulsion.

Q. In your view, would the existence of oil in bilges in any way constitute a fire hazard? A. Not in any way whatsoever.

Q. As far as this principle of emulsification is concerned, was it not considered by a committee set up by the Ministry of Transport? A. That report, published by the Ministry of Transport, was the report of a committee to find - (objected to; pressed).

10

Q. Have you the report with you? A. Yes.

Q. Tell us what it is. A. This is a report by the Ministry of Transport, entitled Report of the Committee on Prevention of Pollution of the Sea by oil, published in London, 1953.

Q. What is the constitution of the committee? A. They are many people who were concerned with this problem - General Council of British Shipping, Oil Companies, Dock and Harbour Authorities Association, British Transport Commission, Dry Dock Owners and Repairers' Central Council, Admiralty, Ministry of Agriculture and Fisheries, Ministry of Fuel and Power, Department of Government Chemist, Department of Scientific and Industrial Research, Ministry of Transport.

20

Q. Would you refer to any pages in that book, and tell us the pages you refer to, as confirming your views? (Objected to; allowed). A. P.6, para. (c). The whole of this paragraph is in inverted commas, so I think it has been quoted from a United States Bureau of Mines Report - (objected to).

30

HIS HONOR: Are you going to tender this?

MR. MEARES: Yes.

(Form not objected to, but fact objected to).

HIS HONOR: As at present advised, I would allow the tender of the book, but if it contains statement of fact about what people found out when they made certain tests, or what their investigations showed was the position as to the occurrence or non-occurrence of fires and so forth, I will not treat it as evidence of any of those facts. But I will admit the document, if you press it, as being part of the material on which this witness is basing his opinion.

40

MR. MEARES: Might I refer to the specific pages only?

HIS HONOR: Yes.

MR. MEARES: Q. You have referred me to p.6. Is there any other page to which you wish to refer me? A. P.14(?) too.

10 (Appendix VI to abovementioned publication, being report by Mr. Ashmore, Department of Government Chemist, on certain Government experiments on behaviour of oil films, tendered.)

Q. You I think, rely, as confirming your opinion, on Appendix VI and para. (c), p.6? A. Yes.

(Abovementioned publication admitted and marked Exhibit "2".)

20 Q. On p.269 of the transcript, the witness, Mr. McAskill said that he had experience of oil fires occurring in hot processes. In your opinion, is there any risk of fires from fuel oil, or other oils, occurring in hot processes? A. There is always a risk of fire from any oil, occurring in a hot process, because the temperature of the oil with which you are working is very close to its flashpoint. An example would be fish-frying, or making fish and chips in a large vat of oil. The temperature of the oil used for the frying process is very close to its flash point. That is always a dangerous condition, because you are liable to get fire starting then.

30 Q. What about hot processes in industry?
A. Another example would be the quenching of hot metal, in quenching oil. There is fire danger there. The burning of fuel oil in ships would be a hot process, because the oil has to be raised to a high temperature in the burner. It is raised to a slightly lower temperature, in the tanks, before it is pumped to the burners, and the inside of the furnace in which the oil is combusted, is at a high temperature.

40 Q. Can you think of any example of fuel oil being a risk, if it escapes from the pipe or flange of the engine burning the oil? A. Only if the oil is at a very very high temperature, and you have an accident or rupture of the pipe and it escapes that way, but nothing else.

Q. Why is it a risk? A. Because it is itself very high, and it can fall on to a hot plate, which will make it even hotter.

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
1963.

Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
 1963.

Examination
 continued.

Q. Is that risk in any way comparable with the risk of oil fuel on waters? A. None whatsoever, because the oil is at temperature close to its flash point, in your hot processing. In this particular instance its temperature is far removed from its flash point.

Q. Mr. Pye, at p316 expressed the view that if welding operations are being carried out such that droppings from the welding and that were falling on the oil or any other materials which may be floating on the oil, it would create a position where it would be likely that the oil would be ignited. What is your view about that theory? A. It wants a lot of qualifying, does not it? Drops, I think you said, from welding or cutting operations, falling on to the surface of the oil, would be completely harmless - could not set fire to it at all. But he also qualified that by saying if it fell on some material floating in the oil. What material? It has to be a specific material. If it fell on a dead log floating in the oil, it would not do any harm. But if it fell on cotton waste floating in the oil, it would be exceedingly dangerous. The most dangerous material in this case is cotton waste.

10

20

Q. You mean the most dangerous of any that could have caused this trouble? A. A particular vicious and dangerous fire hazard.

Q. Prior to 1951 and, in fact, prior to the time you considered this problem in 1956 or 1957, were you aware of the dangerous qualities of cotton waste, related to a fire risk that was created undoubtedly on November 1st? A. I was not (Objected to; latter portion of answer struck out by direction.)

30

Q. Have you, since you gave evidence in the last case, read of the smouldering properties of cotton waste? A. Yes, to some considerable extent.

Q. And the date of the publication? A. 1951, 1952, 1953 and 1954.

40

Q. Can you express an opinion now as to whether you can think of any more suitable wick, in the circumstances of this fire, to have caused the fire, than cotton waste? A. I cannot think of any more suitable sick and I cannot think of any more suitable substance for starting off a fire, from even a cold spark, than cotton waste.

HIS HONOR: Q. What do you mean by a cold spark?

A. A cold spark could be the spark which has stopped glowing and no longer shows any incandescence whatever. I think I would term that better still as a cool spark.

MR. MEARES: Q. Why is this? A. Why does cotton waste have this effect - because it is made up of very small fibres and exhibits a very big surface area.

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
1963.

Examination
continued.

10 Q. What does this create? A. That means that any combustion that takes place on such a material goes very rapidly and may get in and around it very quickly, so the smouldering can very rapidly become flame.

Q. So far as its smouldering qualities are concerned, are they infinitely better than the majority of other substances? A. I think they would be a great deal better than most other substances.

20 Q. Can you think of any other substance that would be the equal of it? A. Cork dust would be getting close to it, I think.

HIS HONOR: We have heard some discussion in this case about hessian. Would you wish to make any comment by way of comparison, between cotton waste and hessian, in the field of which you are now speaking? A. Yes. I think they are both equally culpable in this respect, but the cotton waste, I think, beats the hessian a little.

30 MR. MEARES: Q. As far as the ability of hessian to be lit from a spark is concerned, would that be less or greater? A. I think it is less liable to catch fire from a cool spark than cotton waste.

Q. What about from a hot spark? A. I think there is no doubt about that. You can get hessian alight from a hot spark.

40 Q. Capt. Diamond said, at p.327, that he would consider this discharge of oil, as master of a ship, as being a grave fire hazard. What would you say to that? A. No.

Q. There has been some talk about torpedo action, causing fires on oil. Has this any relation to the risks of oil on water in this case? A. None whatever.

Q. Why do you say that? A. The fire you would get from a torpedo with an explosion, must be very great, must be very hot, must be distributed

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
1963.

Examination
continued.

over a wide area, distributed over any oil floating on the water: I think the cases are not comparable.

Q. The torpedo, of course, has material inside its head for the purpose of causing an explosion and fire? A. Exactly that, and I think it would cause a fire provided it ruptured the oil and the oil came on to the water.

Q. And then you have in the ship, usually speaking, fire? A. Yes.

10

HIS HONOR: Q. You mean fire other than an oil fire?

MR. MEARES: Q. Fire other than an oil fire? A. Yes.

Q. As far as bunkering is concerned, of fuel oil, or discharging of fuel oil, in your opinion would there be any likely fire hazard if the bunkering were done into the open hatches and the tanks? (Objected to: pressed: allowed).

MR. MEARES: Q. In relation to the bunkering of fuel oil of flashpoint 150 or above, into ships, in your opinion in any way would a fire hazard be caused if the oil was poured directly into the tank through an open hatch? A. That I think is what is known in marine circles as overall loading of a tank in a tanker. That would be a completely safe operation to carry out with an oil of a flashpoint of over 150. That is quite specific that that is safe.

20

Q. Are you confirmed in that opinion by any textbook or treatise? A. By the regulations of the United States Coastguard and by the Tankerman's Manual, which is published specifically for tank ship crews.

30

Q. When you refer to the Tankerman's Manual do you refer to a book published in 1946, written by R.J. Wooler, called "The Tankerman's Hand Book" and described as a guide to loading and discharging oil cargoes? A. Yes.

Q. On what page do you rely? A. On page 2.

40

Q. Is it contained on page 2? A. Yes.

MR. ASH: I object to the passage going into evidence at all.

HIS HONOR: I allow it.

WITNESS: "Inflammable oils (grades A,B and C) should always be loaded through the tank vessel's

pipelines. Combustible oils (grades D and E)" -
 MR. MEARES: Q. Which grade is this according to
 your book? A. The oil in this spillage was grade
 E. "which includes such products as kerosene,
 fuel oils, lubricating oils etc., are frequently
 loaded 'overall' by placing the end of the cargo
 hose in the open tank hatch."

10 "This is a safe procedure because such oils do
 not give off inflammable vapours at usual atmos-
 pheric temperatures".

Q. There has been some suggestion made in this
 case by Professor Kirov, and I think by somebody
 else, that because of the existence of oil
 between the "Corrimal" and the wharf and because
 of the existence of the wharf there would be a
 lack of ventilation in that area. You have heard
 that evidence? A. Yes.

Q. Do you agree with it? A. No.

20 Q. It has been suggested on that hypothesis
 that there would be vapours under the wharf from
 the oil which would increase the fire hazard
 compared with the oil in the Harbour elsewhere.
 What is your view as to that? A. If the water
 was boiling, Yes; but if it was cold, as it was,
 No.

30 Q. From your experience as far as vapours are
 concerned coming from oil well under its flash-
 point, are they given off to any material extent
 until the flashpoint is reached or not? A. Not
 to any material extent. They do not constitute
 a danger to a flame until the flashpoint is
 reached. You can go on heating this stuff till
 Doomsday, providing your temperature is below
 flashpoint, and you put a flame into the top
 of the surface of the oil, you will not get a
 flame.

Q. Taking this oil lying on water - and I think
 you know the temperature of the Harbour approxima-
 tely at this time? A. Yes.

40 Q. Take that underneath the wharf, do you think
 its condition of lying there would in any way at
 all be a relevant consideration as a fire hazard
 because of the giving off of vapours under that
 condition? A. None whatsoever.

HIS HONOR: Q. I think it was part of the theory,
 if I understood it correctly (not yours but some
 other people's) that small quantities of vapour
 having been given off would remain without being

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
 1963.

Examination
 continued.

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
 1963.

Examination
 continued.

dispersed in this position to a greater extent than would be the case if they were in a more open area. As I understood it, it was part of the theory that if you did get an ignition agent close to some of that oil, and one must suppose I think an ignition agent hot enough to start some flashing, then you would have a greater chance of getting a rapid spread of fire than under the like conditions in a more open area. I think that was part of the theory, not at this point of the theory at any rate, that you would be more likely to get some fire started because of this collection of vapours, but if you did for some reason get a fire started, you would get a rapid spread instead of perhaps a fire that would flash and quickly die. Have you any comment to make on that sort of theory. if I have expounded it correctly? A. I would like to say this, that first of all the conditions in the space between the "Corrimal" and the shore on which the wharf was built and the decking above the wharf and the level of the surface water and the oil on top of it constituted in effect a tunnel, and the wind was at the time of the fire blowing from the north-east, straight through that tunnel, at over 11 miles per hour, so that the wind conditions in that space would be greater than they would be outside, and we would therefore have less chance of any vapour accumulating.

10

20

30

MR. MEARES: Q. Would you endeavour to answer His Honor's question not in regard to a specific time, but generally? A. I would say there was less chance of - I would say there was no possibility of vapours accumulating in that space or in the open sea, not with those temperatures. The temperature of the water would have to be boiling to get the vapours to accumulate.

HIS HONOR: You say that there would not be any such accumulation of vapours as would play any significant part even if one supposes that there was a source of heat close to some of the oil? A. I would say that.

40

MR. MEARES: Q. Insofar as hot objects dropped, such as coke or coal or bolts, or anything of that description, from the wharf or stage, can you envisage them causing a fire on this day or any other day when the oil was there? A. They would have to be dropped through 25 feet I think.

50

Q. No, I don't think so. I think the wharf was 15 feet high.

MR. ASH: About 12 feet on the average.

WITNESS: From the low tide level?

MR. MEARES: Q. Take a minimum. Do not deal with this particular hour or minute. Take a minimum. Would that present in your opinion, from the tests you have done, any fire hazard. A. No.

10 Q. You have indicated, I think, that you have made a search in the literature for the purpose of endeavouring to learn of the occurrence of fires from fuel oil; is that correct? A. That is correct.

Q. You indicated the extent of your research I think on Friday? A. Without being too complicated, Yes, I just said it was extensive research.

20 Q. Could you tell me what the first reference was that you were able to find of a fuel oil fire and where you found it? A. Could I get you to be a little more specific? Do you mean a fuel oil fire, a building on fire, an industrial fire or a fire floating on water?

Q. I mean a fuel oil fire on water. A. In that case I only found one reference.

30 Q. Where was it? A. It was in the annual report of the Fire Research Board, which is an organisation in Great Britain run jointly by the Department of Scientific & Industrial Research and the Fire Officers Joint Fire Research Organisation. This journal is called "Fire Research 1959".

Q. You have looked in other journals and in that journal for preceding years? A. I have looked at that journal in the only 15 volumes of it which have been published up to date from 1947 to 1961. I have searched the literature and cannot find any other reference to the burning of oil on water other than this one.

40 HIS HONOR: Q. That was when? A. Fire Research 1959.

MR. MEARES: Q. Dealing with hazards in relation to this fire, you have the oil on the water and a combination of things happening. In your opinion what was the factor that was the substantial hazard. A. In this particular spillage.

Defendants
Evidence

No.26.

T.G. Hunter

18th February,
1963.

Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
 1963.

Examination
 continued.

Q. Yes? A. There was one hazard and one hazard only: the cotton waste. It was hazardous because it was so easy to start smouldering by a cool spark. Once it started to smoulder it is so easy to ignite into full flame. Once it was fully flaming it was so easy to have that flame continually fed by the oil present so that the length of this flame, the time this flame would burn, was virtually indefinite. It was so easy to get the wind to blow that flame on to the waters and the oil that the whole four or five factors together make this in these circumstances, and in a lot of other circumstances, an exceedingly hazardous material.

10

Q. Had you ever considered this possibility even prior to considering this problem in 1956?
 A. Prior to 1956, No.

Q. When you commenced your experiments had this likelihood occurred to you? A. No.

Q. Before Mr. Justice Kinsella you gave certain opinions as to the question whether a wick, whether it was cotton waste or some other wick, would ever be saturated wholly or partly by water, assuming the wick initially had been dropped on an oil film. Do you recall that? A. Yes.

20

Q. Since that case have you given further consideration to that and done tests or had tests done under your supervision? A. I have supervised tests since then and given it further consideration.

30

Q. Also since the case before Mr. Justice Kinsella have you given consideration, and had the benefit of seeing tests, to whether or not wicks of cotton waste will sink or keep on floating. A. Yes.

Q. What do you say now as a result of your further considerations as to the likelihood or otherwise of a wick being dropped on to an oily surface at any stage absorbing water, assuming water to be under the surface of the oil? A. It can absorb water very quickly under those circumstances.

40

Q. Could you tell me whether it usually happens or whether it is improbable or under what circumstances it happens. A. In a large number of tests I had carried out, the wick had absorbed water, rejected any oil it held; that oil had been displaced from it by the water in periods of as low as four or five minutes. We did other experiments

on water absorption and sinking of the wick took place in half an hour, and others in which it took 14 hours.

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
1963.

10 Q. Generally speaking taking a wick falling upon oil of say a maximum thickness of a quarter of an inch, what would be the tendency for the wick - for a period of time only to absorb oil or for a period of time to absorb water, or after a period of time to absorb oil or water. A. I would say the tendency would be for it to absorb oil and then for that oil quickly to be displaced by the water below it and to sink in four or five minutes. Examination continued.

20 Q. When you say a wick sinks, can you give the court any views as to cotton waste dropped on to an oily surface in relation to whether it would sink or float and if so for how long. A. It would float to start with and it would become waterlogged eventually, and that would occur in a period from five minutes to 14 hours. I would say the average figure would be, say, half an hour.

Q. Have you given any consideration to the question whether or not the position of the "Corrimal" some 230 feet long, lying alongside the sheer legs wharf some 600 feet long, which you have seen, would have caused in any way the oil to dam and become thick, since the last case? A. Since the last case I believe it would not dam and become thick because of that effect.

30 Q. Why do you say that. A. It would flow freely from the ends of the sheer legs wharf. Since the last case I have found out that that would be the tendency for a free-spreading film on the water.

Q. You expressed the view in the last case I think that possibly this oil could have been a quarter of an inch thick? A. I think I did.

40 Q. In the light of your further studies on these surface problems, do you still adhere to that opinion. A. No, I think it must have been smaller than that, 1/8th of an inch, not a quarter. I now feel it could not have built up to quarter of an inch.

Q. As far as the possibility of a fire hazard being created in the Harbour as a result of somebody spilling petrol, or some other inflammable substance of that nature on the oil was concerned, would that have been something that you would have thought of in 1951? A. Yes, definitely.

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
1963.

Examination
continued.

Q. Do you think it would have been a risk or not? A. It would depend on the amount of petrol that was spilled. If it was only a small quantity it would not have been any real risk; if it had been a large quantity it would have been.

Q. As far as a large quantity of petrol is concerned, would it last or stay on the oil (Objected to as irrelevant).

HIS HONOR: I suppose, Mr. Meares, if we are examining in general the problem of the risk that might have been created by the spillage of oil, you are entitled to examine if you want the risks created by petrol, the risks created by bombs, or the risks created by torpedoes or any possible risk. 10

MR. MEARES: If Your Honor thinks it would be of no assistance, I do not press the question.

HIS HONOR: I do not know quite what use you intend to make of it.

MR. MEARES: I won't press it. 20

Q. As far as the flashpoint of this oil is concerned, you are aware that the flashpoint is a flashpoint tested in a closed cup for the purpose of establishing at what temperature heated oil will flash? A. In a completely closed vessel with a lid on.

Q. The open cup test I think determines at what heat oil will flash if the lid of the vessel in which the oil is is open. A. If there is no lid at all, Yes. 30

Q. That is known as the open cup test? A. Correct.

Q. Could you tell me the difference between the flashpoint of this oil in the closed and open cup tests? A. The closed flashpoint was 170. The open cup flash was 225.

Q. Would that open cup flashpoint be greater or less than the flashpoint of the oil on the Harbour? (Objected to: allowed).

HIS HONOR: Unless I have completely misunderstood, you have not agreed that lying on the Harbour water it would flash at 170 degrees. 40

MR. MEARES: What do you say about the Harbour water? A. Lying on the Harbour water what would the temperature be to which the oil would have to be heated in order to get a flash?

Q. Yes. A. Or a portion of the oil to be heated. Defendants

Evidence

Q. Yes. A. You could not get the whole oil heated. It would have to be heated more than the open cup flashpoint.

No. 26.

Q. Are you able to express an opinion as to how much? A. No, I would not like to give you a quantitative estimate. I certainly would have to be more than 10 degrees. It might have to be a lot higher. That would be a guess. I could not give you a really quantitative answer.

T.G. Hunter

18th February,
1963.

10 Q. I think you are endeavouring to have some tests made. If I knew I would not need the tests. Examination continued.

Q. As far as the temperature at which the oil will ignite is concerned, could you discuss that in relation to the oil positioned as it was in the Harbour or in an open cup or elsewhere? A. Do you mean the temperature at which the whole of the oil in the open cup has to be raised to in order to get it to burn?

20

Q. Yes? A. Or if it is the oil on the Harbour, the temperature to which part of that oil has to be raised for part of it to burn?

Q. Yes. A. In the open cup test it would be another five or 10 degrees higher than the closed cup flashpoint. In the Harbour I think you would have to raise it much higher still to get a small portion of that oil to catch fire.

30

Q. Insofar as oil is concerned of a depth of 1/16th of an inch or less, can you tell me whether or not in your opinion it is possible to ignite it on the Harbour? A. I do not think you will.

Q. Do you agree with evidence which has been given that it would be quite safe to weld where oil was leaking from a ship's tank on to the outside of a hull, assuming that the welding was taking place below the level of the oil on the opposite side? A. Yes, and provided there was no possibility of the flame getting into the vapour space or air space above the oil.

40

Q. As far as your experiments with wick were concerned, did you reach any conclusion as to the chances of a fire from waste igniting or a wick igniting and not going out in still waters or in waters agitated by wind? A. There is more chance of it igniting the oil on the surface of the water if the wind is blowing a flame towards the oil than

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
1963.

Examination
continued.

if it is just quietly floating and burning in still water.

Q. Did you consider whether any wind was ideal or better than any other? A. Yes.

Q. What did you find? A. Approximately 2 miles per hour was necessary.

Q. Did you reach any conclusion about wind between 11 and 17 miles per hour? A. That was necessary to fan the smouldering cotton waste into flames, and if it was greater than 17 miles an hour it blew the flames out. 10

Q. Some questions have been asked as to the position of something in the form of a piece of hessian which was alight being thrown on to the water. Questions have arisen as to whether or not, assuming the hessian that was thrown on did not land on the water flat and was not itself a thin object - whether if the burning edges of the hessian came into contact with the water, whereas the centre of the hessian was raised and was burning also - as to whether the burning edges would not on contact with the oil on the water create a fire rather than operate as a wick and cause radiant heat. Do you follow what I mean? A. I am afraid I am not quite clear. 20

Q. I want you to assume that on the oil, no matter by what means, you have got cotton waste or hessian, and you get a condition where because of the shape of the thing in question there is an actual fire of the edge of it or some part of it right on the layer of the oil. A. I think provided there was enough periphery of the cotton waste or hessian material to give big enough flames you would get it to catch fire. 30

Q. If you got that condition of the actual flame coming right down on to the oil itself, would you expect the flame to continue or to be extinguished or to cause the fire or what? A. This is the flame coming right down on to the oil?

Q. I have put that to you. I will put it once again in case I have been ambiguous. I want you to take a piece of hessian or any other article you like, and imagine it to be any shape you like, and imagine at some point of time around the edges of it or elsewhere, when it is right on to the oil itself there is flame, so that you have some part of it flaming, alight, and it gets into contact with the oil itself. Would you imagine or think that that would itself cause a fire or on the other 40

hand would the oil tend to douse the flame? I want you to compare this in relation to a wick?
 A. I think it would tend to set fire to the oil under those conditions provided the quantity of of your material was big enough and on fire enough, if I can put it that way. The only reason why a wick functions as an igniter is because it will burn for a continuing period of time in order to get the oil in it heated up. You can get the same effect by having a large piece of burning material, a very large piece which will heat up the oil adjacent to it, to the ignition temperature in a much lower time than a smaller burning piece would. I think in the case you described we could perhaps get ignition of the oil.

10

Q. May I suggest to you - correct me if I am wrong - that the larger the wick and the more suitable the type of material, the greater the chance? A. Much; quite definitely.

20

Q. In 1951, in November, with the scientific knowledge and the experience you possessed as to the qualities of fuel oil, given the circumstances which existed on the relevant days, namely the oil, welding operations being conducted, and sea water underneath the oil, would you have considered that there was any risk of fire as a result? A. No, none whatever.

30

Q. Would you yourself have thought of this combination of circumstances which has occurred in this case: oil on the water; welding operations above cotton waste or other articles conveniently situated down below; a smouldering of these things; a subsequent flame and burning? (Objected to; allowed) A. I would not have thought of those circumstances at all.

Q. Or anything like them? A. Or anything like them.

40

Q. When you were experimenting in the laboratory with welding apparatus for the purpose of determining whether or not the products of it would ignite cotton waste, did you have difficulty in situating the cotton waste so that the sparks would hit it? A. Not too much difficulty. Once we had mastered the technique it was fairly easy.

Q. How did you master the technique? A. By finding out from experiments without the waste where the molten particles from the cutting operation would fall.

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
 1963.

Examination
 continued.

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
 1963.

Examination
 continued.

Q. In relation to your tests that were made and the fire hazard in this case, do you think there would be any appreciable difference in risk between the oxyacetylene cutter on the one hand and the electric welder on the other? A. None.

Q. You have listened to particulars of the tests that Mr. Parker made, given, have you not? A. Yes.

Q. Do you agree that his description of those tests was accurate? A. I thought it was particularly and meticulously accurate. 10

Q. Having listened to the evidence in the Mort's Dock case before Mr. Justice Kensella, and having read the evidence also in this case, have you formed an opinion as to how this oil was probably lit? A. Yes, quite definitely.

Q. What is it? (Objected to; allowed).

A. Cotton waste was floating on the surface of the oil below the sheer legs wharf, probably on the raft. There was a continuous film of oil below the sheer legs wharf. There was a strong current of air coming from the north-east going up that tunnel between the ship and the sheer legs wharf of at least 11 miles per hour: welding and cutting were going on on the sheer legs wharf above the floating cotton waste. A spark from the welding and cutting operation fell on that floating waste and it smouldered. The wind velocity was just right to fan that smoulder into a blaze and it was large enough also to put the flames of that balze on to the surface of the oil, and hence we had the ideal favorable conditions for the whole lot to catch fire. 20 30

Q. Are you of the opinion that the oil being heated in the immediate vicinity of the wick would give a geometrically progressive heating up of the oil? A. I think roughly that.

HIS HONOR: Q. You said in this opinion that a piece of cotton waste was floating probably on a raft. A witness who claimed actually to have seen what happened, when asked what was the material that was floating on something else, said "I could not rightly say". All I want to know, just for precision, is, is it right to say that in the opinion of yours that you have just expressed it would not necessarily be cotton waste but it could have been some other type of material? A. I think it could have been some other type but most unlikely because of the 40

large usage of cotton waste on wharves and docks, for cleaning purposes.

Defendants
Evidence

MR. MEARES: Q. As far as waste is concerned (some evidence has been led as to it) waste is practically a universal method of cleaning used in engineering processes. A. I should think so. The tradesmen are not expected to bring their own cleaning rags with them.

No. 26.

T.G. Hunter

18th February,
1963.

Examination
continued.

10 Q. For cleaning machinery, cleaning parts, cleaning grease, cleaning oil, cleaning things off objects and one's hands. A. The normal provision for that purpose is cotton waste.

20 Q. I put this to you specifically. If this problem had been posed to you in 1951, and in truth until you had done your tests with cotton waste in connection with this case, "Would it have been safe to have conducted shipbuilding and repairing operations, including welding and cutting on or about the sheer legs wharf with the existence of the oil as has been described?" what would your view have been? (Objected to; allowed). A. Could I answer it by saying what I would have done myself under those circumstances?

Q. What? A. I would have gone on with the operations, as I would today.

30 Q. Would you have gone on with them today without taking any precautions? A. One simple elementary precaution to see that the workmen engaged on that work did not have cotton waste, newspaper, old shirts and things that they could chuck over on to the oil; it would have been perfectly safe (Objected to; allowed).

40 Q. As far as the risk of fire from the operations of the oxy-cutter or welder falling on floating wood is concerned, what would you say about that? A. I do not think there would be any risk there. I think the sparks would be out. They would be of too low a temperature to set fire to wood. Whereas they might set fire to cotton waste, they would not touch wood.

Q. You did some tests using a blow lamp? A. No, we did not use a blow lamp. We used an oxy-acetylene torch. That is the highest flame we can get industrially. It is 6,000 degrees Fahrenheit.

MR. ASH: My friend was very kind about filing the particulars of claim a little late. I feel at some stage before the defence finishes my friend might give me the particulars of defence.

Defendants
Evidence

No. 26.

T.G. Hunter

18th February,
1963.

Examination
continued.

MR. MEARES: Our defence will amount to a denial of certain allegations, and it will have the effect of a demurrer in law as to certain others. We shall endeavour to get it ready for you.

MR. ASH: From what my friend says, I can safely proceed with the case in the sense that there will be nothing new.

MR. MEARES: Yes.

(FURTHER HEARING ADJOURNED UNTIL 10 a.m.
Tuesday 19th February 1963).

10

IN COMMERCIAL CAUSES Nos. 3000 & 3001 of 1955

CORAM: WALSH J.

THE MILLER STEAMSHIP CO. PTY LIMITED v. VACUUM
OIL CO. PTY. LTD.

CALTEX OIL (AUST.) PTY. LIMITED and OVERSEAS
TANKSHIPS (U.K.) LIMITED

R.W. MILLER & CO. PTY. LIMITED v. SAME.
TENTH DAY: TUESDAY, 19TH FEBRUARY, 1963.

19th February,
1963.

20

THOMAS GIRVAN HUNTER
Examination continued:

MR. MEARES: Q. Yesterday you expressed some views concerning the possibility of an emulsion of oil with water, if left on the harbour for a period of time, and the possibility of the oil losing some of its combustible qualities as the result of the process of oxidation, and you said that you did not feel that you could express any opinion on the degree of changes, in relation to this particular spillage, after some 58 or 59 hours but you did, in answer to a question, from His Honor I think, postulate that so far as the shores, and I think you also said the piles were concerned, that there, after 58 or 59 hours, you would have a substantial change. But you did not express any particular opinion, as I recall it, in regard to the oil between the "Corrimal" and the shoreline of the bay. When you gave that evidence had you directed a test to be made in relation to this problem? A. Yes, I have.

30

40

Q. When was the test commenced? A. I got some of my staff to start this test at 4 o'clock yesterday afternoon.

Q. Where was it done? A. In one of the laboratories of the Chemical Engineering Department of the University of Sydney.

Q. What constituents did you have for the purpose of doing it? A. The apparatus, I take it?

10 Q. Oil and water? A. Yes, sea water and this residual fuel oil.

Q. You mean fuel oil with a flashpoint of 170? A. Furnace oil with a flashpoint of 170.

20 Q. What did you do? A. I had a pyrex dish approximately 8 x 10" and 4" deep, which was filled fairly full of sea water, and a quantity of this furnace oil was poured on to the sea water and when it had finished spreading it occupied one-third of the film of the dish. It was there in a thin film of about one-twentieth to one-sixteenth of an inch.

30 Q. Go on. A. This dish was mounted on a machine which gave it a shaking motion, very gentle shaking motion. The dish was horizontal and was moved backwards and forwards at a quite slow speed. The water and oil in the dish behaved as if it was water with an oil film, gently lapping up against the shore or the piles of piers, and there was a rise of the liquid up against the side of the dish to the extent of about one inch, and then that came down on the backward stroke. In effect, I was trying to duplicate a very small wave motion which would cause this water and oil mixture to lap up against solid objects.

40 Q. It was continued and is still being continued. Is that correct? A. At half past 5 last night, when I inspected it, the oil had considerably thinned, the depth of the film had thinned out and it practically occupied the whole of the dish, the whole of the surface of the sea water in the dish and already -

Q. Do you mean by half past 5? A. By half past 5 quite thick deposits of a gummy black substance had collected on the two sides of the dish, the two ends of the dish where the wave motion was most pronounced. I inspected it again this morning, at half past 8, which was about 16½ hours, I think, after the test had commenced, and

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
 1963.

Examination
 continued.

the change was startling. The size of the oil slick had shrunk into its original area, and it had broken up into a number of circular patches, and when you touched one of the patches on top with the point of a pencil, it felt quite hard. There was a very definite hardening of this oil film. I took a pencil and inserted it below the surface of the water and tried to pick up one of the oil patches and I was able to pick it up quite easily. The oil did not float any longer. It draped and hung down from the surface of the pencil. That was quite clear, from the texture of the film, that it was no longer fuel oil but was an emulsion of the original fuel oil, probably an emulsion of the oxidised fuel oil and sea water. 10

Q. What about the sides, ends of the dish? A. The ends of the dish had not altered very much. There was still this quite considerable deposit of this thick gummy looking material on the ends.

Q. Having observed that test after 16½ hours up to date, and last night also, are you able to add anything to the opinion you expressed yesterday concerning the probabilities of combustion in regard to the spillage on the Thursday when the fire occurred, and a day before it, first of all on the shoreline, secondly on the piers, and thirdly of the oil between the Corrimal and the shoreline? A. I would like to suggest that the possible happenings were as follows: I think we should consider the oil spill in two portions, and exposed oil surface which would be in Mort Bay, and by "exposed" I mean exposed to the wave action of the waves in the bay, and a sheltered oil surface, which was sheltered by the Corrimal, behind the Corrimal, between the Corrimal and the shoreline and below the decking of the Sheerlegs Wharf. 20 30

Q. In regard to shelter, I think you expressed the opinion that that wharf could, in certain circumstances, form a tunnel? A. That is correct. There were 59 hours between a spill and the outbreak of the conflagration and for approximately 39 hours the wind was from the south-south-east or the east-south-east, and the oil on the port side of the Corrimal must have been protected from any wave motion that the wind had generated. For another five or six hours the wind was from the western quarter and the oil behind the Corrimal would be sheltered by the land. For an hour or two before the fire broke out the wind was in the northern quarter, at a very gentle rate of a few 40 50

miles an hour and for three hours before it was from the north-east or north-north-east and must obviously have been blowing down the tunnel I described yesterday. So the oil in that tunnel would only have been subjected to wind motion for two or three hours. I very much doubt if there were very many waves going through the tunnel. In order to get a wave, you must have a wind blowing across a large surface of water, and I cannot see the waves going down the little tunnel I have described, so I feel that the oil in that tunnel was comparatively sheltered from this wave motion and remained in much its original condition. I think it increased a little in viscosity, specific gravity and flashpoint, because that is a property of all fuel oil when spilled on water anyhow.

The other oil, apart from the oil in the tunnel, was subjected to strong wave action and I think there is no doubt that this oxidation and emulsification nevertheless occurred, that it built up on the shoreline in thick or comparatively thick tar deposits, which were not tar or not oil but were oil-water emulsion, that the oil on the surface of the water must have broken up into patches. That would be assisted by the wind as well as the waves, by the propellers of launches going through it, and was not in a condition to be combusted by any fire which took place. Therefore, in order to have a fire, we can only get a fire started on that still oil, below the Sheer-legs Wharf decking.

Q. Or any other space, I assume, similar?

A. Similarly sheltered from wave action.

Q. I ask you some questions yesterday about the distinction, about the closed Pensky-Marten flashpoint test and the Cleveland open cup test. It follows, of course, that you cannot test the flashpoint of oil in the open, other than through the open cup test, may I take it, because you have to have some sort of container to ascertain the extent to which you heat the oil up in the open?

A. That is true. I would hate to try to heat up the small portion of a large spillage, on water, and then try to find out -

Q. As far as the open cup test, in the open, was concerned, what did that establish? A. We established by the equivalent open cup flashpoint test that the flashpoint was 210 degrees Fahrenheit, which was much higher than the closed flashpoint of 170. That is what one would expect.

Defendants
Evidence

No.26.

T.G. Hunter

19th February,
1963.

Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Examination
continued.

The point at which the oil burned and continued to burn -

MR. MEARES: I think I should say that when the professor is speaking of this test, it was done by Mr. Parker.

MR. ASH: I do not take a point.

MR. MEARES: If my friend has any doubts about its validity, I will undertake to call Mr. Parker.

MR. ASH: Not one of his assistants, certainly not.

WITNESS: That was called the fire point and was 235 degrees fahrenheit. 10

MR. MEARES: Q. In the closed cup test the means of flashing the oil is prescribed as being a gas flame, which is affixed to the machine, of a certain length? A. It is a very small gas flame. It is a gas flame thirty seconds of an inch in diameter, spherical, and it was almost the exact size of a match head.

Q. Were you able, with the open cup test, using the size of flame you used in the closed cup test, to flash the oil in the open cup test? A. I think we are getting a little at cross purposes here. The evidence I gave about the open cup flashpoint was the standard open cup flashpoint taken in the laboratory, and it gave 210. 20

Q. I am aware of that. I am asking you as far as this test was concerned in the open cup, was it possible with the open cup test, with this oil, to flash the oil at all using the closed cup flame of seven thirty seconds of an inch or, on the other hand, was it necessary to use a flame of about one and one-eighths inches? A. The previous flashpoint of 210 was taken in the laboratory, in still air conditions. 30

Q. I am asking you about the open cup Cleveland test which Mr. Parker did yesterday. I will put the question again. Was it necessary or not, with that test, before you could get the oil to flash, to use a flame greater than the flame used in the closed cup test, of seven thirty seconds of an inch? 40
If you do not know say so and I will call Mr. Parker.
A. I am sorry. There is some ambiguity here. I am giving evidence on the open cup test and Mr. Meares is asking me questions on an open air cup test, and that was a different test altogether.

Q. I am sorry. As far as the open air cup test was concerned, did you need more flame for getting

a flash than in the Cleveland or closed cup test? A. Yes. We could not get the oil to flash or fire at all by doing this open cup test in the open air with wind velocity 0 to 5 miles an hour, using the standard flame, and in order to get it to ignite under those conditions, which I think you can very adequately describe as an open air cup test, we had to increase the flame from a small match head size to one over an inch long.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

10 Q. I am sorry. It is my mistake. There is one
other aspect of your evidence only I want to refer
to. I think you gave two answers which seemed
to me to be equivocal. You were referring to wind
velocities that were necessary and ideal, and you
referred to a wind velocity of 2 miles an hour
as being, I think, necessary, and you also
referred to wind velocities of 11 to 17 miles an
hour. If the answers are transcribed correctly
and I might say that I think they are, the evi-
20 dence looks equivocal. Would you deal with this
question once again for us? I want you to let
us have your opinion as to the wind velocity
that is necessary or that will cause smouldering
cotton waste to ignite, and also the wind
velocity that is necessary to bend the flame
down on to a surface on which the cotton waste
is. A. I think it is Exhibit 1, one of the first
exhibits, when the cotton waste was floating on
an oily surface and we used a wind velocity of
30 approximately 1.6 miles an hour, and we were
able to bend the flame down with that wind
velocity and get the cotton waste to ignite. And
the oil below it to ignite, but that was not
good enough. What we had to determine was whether,
with oxy-cutting and oxy-welding going on 11, 12
or 13 feet above that cotton waste, floating on
bark on an oily surface, again on water, with
those sparks, whether those sparks, if they fell
40 on that waste would cause it to smoulder, burst
into flame, would cause it to set the oil on
fire, and would they do that with a wind velocity
of 11 miles an hour?

Examination
continued.

Q. As far as the 17 miles an hour is concerned,
what did you establish? A. That we were practi-
cally certain at 11 miles an hour. At 17 miles
an hour the oil would not catch fire because the
flames was blowing out.

50 Q. Have you read the United States Coastguard
Manual of July 2nd 1951, which is described as
being a manual for the safe handling of inflamm-

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Examination
continued.

able and combustible liquids? A. I have.

Q. Published by the United States Government Printing Office. Are you able to say whether your view has been confirmed, concerning the safety factors, risk of fire with fuel oils, by that manual or not? A. It has been confirmed.

Q. Is there any particular part of it which confirms that view? I do not want to worry about the whole book. Give me the references. A. I think it is on p.8. There is more than one page, but on p.8 it says that inflammable or combustible liquids of all kinds may be divided into three classes for the purpose of safe handling. The manual then goes on to define these three classes of liquids. One is inflammable liquids - (Objected to; allowed) - and these are liquids with a flashpoint of below 80 degrees fahrenheit, an open cup flashpoint below 80 degrees fahrenheit. The second class is defined as combustible liquids which have a flashpoint above 80 degrees fahrenheit. The third class is a highly inflammable liquid, which I do not think I need deal with here because it is liquified petroleum gas, in effect. The manual suggested that combustible liquids, with a flashpoint above 80 degrees fahrenheit, are relatively safe to handle and include such petroleum products as kerosene, light and heavy fuels, lubricating oils etc.

At p.13 it goes on to explain what it means by the different grades into which it breaks up these classes of inflammable and combustible liquids. Based on the different characteristics of oils, the names of various oils known to commerce may be grouped as follows, and the groups are five, and they are graded A, B, C, D and E.

Q. I do not think we need deal with some. Deal with grades D and E. A. Grade D is kerosene, light fuel oils, distillates and a very few heavy crude oils. Grade E is the safest grade in the classification of combustible liquids and it contains heavy fuel oils, "Bunker C", diesel fuel, road oil, lubricating oil, asphalt and coal tar, fish animal and vegetable oils. On this same page, p.13 it continues, having described the various kinds and grades of liquids, "It is now appropriate to discuss the essential requirements for safely handling them. Since more care must be taken with the inflammable liquids, the handling of this group will be described and reference will be made, where appropriate, to the combustibles or

safer grades D and E." It is quite clear that the classification and grading is a very realistic and, I think, a very practical one.

Defendants
Evidence

No. 26.

MR. ASH: I take it Your Honor has admitted those readings as confirmatory of his own opinion?

T.G. Hunter

HIS HONOR: Yes.

19th February,
1963.

10 MR. ASH: Q. Do you recollect before the first Morts Dock hearing, you devoted a great amount of time to the subject matter of this case? A. I think that would be a correct statement.

Examination
continued.

Q. You spent about 500 man hours? A. Yes, at least.

Cross-
Examination

Q. And you say you performed 500 tests? A. 468 at the date of that hearing.

Q. And the purpose of doing that, at that stage, was thoroughly to brief yourself to express opinions in Court? A. Correct.

20 Q. And you were in the witness box, in that case, for a long long time? A. Yes.

Q. And following all those tests and your previous experience in life, you gave a lot of opinions? A. Yes.

Q. Were they considered opinions? A. Yes.

Q. And were they true? A. Yes, to the best of my knowledge they were true.

Q. And they are still true? A. I do not know whether an opinion can still be true. One finds other things and so opinions sometimes alter.

30 Q. Subject to the matters you have mentioned to Mr. Meares, on which you have performed further tests, your opinions are still true? A. I think in most of them. They may have been modified slightly.

Q. The matters you adverted to are what happens to the oil on the foreshore and piles, in the way of oxidation and emulsion; you have performed some further tests on that matter? A. Yes.

40 Q. You performed some other tests on the type of wicks on oil? A. Yes.

Q. And you said yesterday that you did not think now that the oil would dam up and you did not think now that the thickness of the oil would be one-quarter of an inch? A. That is what I think now.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Q. But subject to that, all your opinions still hold? A. I should say so.

Q. If I can come to the short relevant facts of the matter, would you agree with me that furnace oil, if ignited by flame and the flame burns sufficiently long, will burn? A. It has to burn a long time on a given area.

Q. Sufficiently long? A. Sufficiently long.

Q. You will agree with that? A. Yes.

Q. And in that sense, you would agree that once the ignition is there and once you get the flame for sufficiently long, the oil is highly inflammable at that stage? A. I have to qualify that. Not the oil is highly inflammable, a small section of the oil on which the flame is impinging is inflammable.

10

Q. The oil burning produces its own vapour and then that vapour burns? A. That is correct.

Q. And then it becomes inflammable, the whole of it, once that process starts? A. The oil then burns.

20

Q. And it burns because, at that stage, it is inflammable, does not it? A. I suppose you could say it is inflammable. Actually, only bits of it are inflammable, as the flame is going along through it.

Q. But when the flame is going along, there is no doubt it will burn fast then? A. Yes. It burns at about 10 feet a minute.

Q. So much so that you will even get up to the stage of a roar of flames? A. I think you would.

30

Q. And especially with a wind of about 10 miles an hour? A. Yes.

Q. Would you agree with me, secondly, that fuel oil when burning, gives off great heat? A. Yes. That is why it is fuel oil.

Q. That the fire increases with intensity as it goes along? A. Would you be a little more explicit?

Q. That once you have the fire started, would you agree that, from the time it was first ignited until it had travelled 10 feet would be one minute. That is right? A. That is right.

40

Q. And before you got to that stage, if the wind were higher than 10 miles an hour it would spread

that distance in less than a minute, much less than a minute? A. It would certainly have an effect on the rate of flame spread but, strangely enough, the rate of flame travel does not seem to be too dependent on the wind velocity.

10 Q. Would you agree with that statement? I am putting to you statements you made in the previous case. If the wind were higher than 10 miles an hour, it would spread that distance, 10 feet, in much less than a minute? A. Certainly in less than a minute, yes.

Q. And it would go from there in a geometrical progression? A. I think so.

Q. So that the next 10 feet would take a much less time? A. I do not think I was meaning the time. I think I was referring to the area of burning.

20 Q. But because of the area extension in geometrical progression, the next 10 feet would take less time? I am putting to you that is what you said? A. No, I did not say that.

Q. And the fire increases in intensity as it goes along? A. Yes. There is more oil burning and the heat is getting intense.

30 Q. I take it that those opinions you have expressed there - and I will remind you that they are all postulated on the presence of an ignited flame to start with - are all opinions you have held for a considerable time? A. Since the first hearing, yes.

Q. Surely those are elementary facts you would have known all your scientific life, are they not, postulating the presence of the ignition agent? A. Yes.

Q. You would not deny that, would you? A. No.

Q. And you say the oil must be ignited by some sort of wick in the first place? A. It is a very favourable method of igniting it.

40 Q. And would you agree with me that any flame, once established would do for that purpose?

A. And it was burning long enough.

Q. And the method of extension of that flame is brought about by one of two positions, a radiant heat or a convection heat? A. Yes.

Q. As regards radiant heat, that is just the heat from the flame radiating around it? A. Like the heat we get from the sun. That is radiating

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
 1963.

Cross-
 Examination
 continued.

heat.

Q. Nothing to do with the flame itself? A. It only depends on the temperature of the flame.

Q. There is no doubt about the temperature of the flame; it is well in excess of 1000 degrees fahrenheit? A. It is 3000 degrees fahrenheit.

Q. And that has some radiant heat? A. Yes. We get radiant heat from it.

Q. And once you get this burning, it draws up the oil near it and vapourises it? A. In the wick, yes. 10

Q. And then this geometrical progression is no doubt due to the fact that, on a wide expanse of oil, there is more oil coming in, and that that burns up? A. I should think so.

Q. And then the convection heat concept, the other alternative, is when you get the wind blowing the flame over the surface? A. Yes, that is so.

Q. I may have put this to you, but you would agree that, no matter what the burning substance was, provided it produced flame, and that flame for a sufficient period of time came into contact with the surface of the oil, that would be sufficient? A. I would not dispute it. That is correct. 20

Q. As regards the type of wick, in this case it could be either some sort of floating flame or one of the piles? A. I think an oily pile, provided it was oil on the pile and not emulsion on the pile, would act as an igniter. 30

Q. I think you just said that the pile itself, with oil on it, could act as an initial wick? A. I did not say wick. I was specific. I said an igniter.

Q. Would you agree with this, that assuming the rise and fall of the tide, there being oil on the surface, you would expect some oil to adhere to the surface of the piles to the extent of the rise and fall? A. That is right.

Q. And I put to you that the inflammability or the likelihood of that pile catching fire, would be affected by any coating of oil that might be on it, of that nature? A. The likelihood of the pile catching fire? 40

Q. Yes, the inflammability or likelihood of that

pile catching fire would flow from any coating of oil that might be on it? A. I am not sure that the pile would catch fire. I think the oil on it would catch on fire, but whether that oil on fire would set fire to the pile, is different.

10 Q. You agree that the likelihood of the whole pile catching fire would be increased by the oil coating? A. Yes. It would not catch fire without oil, but if it did catch fire with the oil coating I agree.

Q. Would you agree that, for that purpose, a pile catching fire with an oil coating, that does not depend on the oil being of a thickness of one-sixteenth or more? A. That is correct.

Q. It could be less? A. I think it would be less, unless the pile was covered with bark and the bark itself got the oil.

20 Q. Of course, in the case of a pile, even a single pile, the risk would be greater at low tide, of it catching fire, if that oil coating was on it, because of the low tide? A. Yes.

Q. There is no doubt that once you have an oil coating on the pile, igniting the pile, that would be an ideal wick to spread it right over the surface of the oil, under the wharf? A. I do not like the word "wick" in that connection.

30 Q. All right. Once you get the burning pile started, that could have ignited the oil right over the surface? A. I think once you have the oil on that pile burning, the oil on the pile would thin and tend to run down the pile and collect as a little pool of burning oil on the periphery of the pile on the surface of the water.

40 Q. And if the surface of the water was covered with oil, would spread over the surface of the water? A. I would not like to forecast that because I have never done any experiments. You will notice my evidence has always been, and my opinions have been definite, when I have done the work. In this case I have not done it so I would be simply guessing.

Q. See if this is what you said last time:

"Q. Could the fire have been caused by a stationary wick, such as a pile? A. The pile is a burning pile?"

Q. Yes. A. Yes, that could have ignited the oil on the surface."

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
 1963.

Cross-
 Examination
 continued.

A. A stationary wick?

Q. Yes. A. But a burning pile is not a wick.

HIS HONOR: Q. Whether it is or not, I think it is put to you that you said that a burning pile could have ignited the oil on the surface of the water around it - could have? A. I think the burning pile would ignite the surface of the oil around the periphery, yes.

MR. ASH: Q. And the, if the oil was on the surface of the water, the fire would continue along the oil, in the way you have described earlier? A. I think if it was on the windward side of the pile, it would fire. As regards the leeward side, I doubt it.

10

Q. You have a pile coated with oil? A. Yes.

Q. It has been set alight and is burning? A. Yes.

Q. It is not in the nature of a continuing wick, burning sufficiently long? A. No. A wick has to suck oil up.

Q. Why would not a pile standing in the water, with a low tide coating on it, act as a stationary wick? A. It has not got the texture. If wood was a good wick we would use it in lamps.

20

Q. Having a burning pile in those circumstances, you resile from this opinion that you expressed, that that burning pile could have ignited the oil on the surface? A. I am not 100% sure.

Q. You think it could? A. I can foresee circumstances when it could, and I can foresee circumstances when it could not.

30

Q. Of course, if a pile for some reason became ignited, whether because it was oil coated or not, but there was no oil on the surface, then of course it could not spread along the water, could it? A. If there is no oil, no.

Q. You would agree, as regards the ignition agent, that any burning substance would suffice in the case of furnace oil, once it is established and burning for sufficiently long? A. Yes, has sufficient flames.

40

Q. Would you agree that the number of agents which can be used to light it is quite extensive? A. I could not find an extensive number.

Q. Do you remember being asked:

"Q. The number of agents that can be used... is quite extensive? A. I could imagine quite a lot"?

A. I can imagine quite a lot, but that is not an answer to the question that it is extensive. I did not say it is extensive.

Q. You could imagine quite a lot? A. Yes.

Q. When you got the picture, as was put to you here, of a continuous film of oil on water, under that wharf, you could imagine quite a lot of agents. A. I can.

10 Q. I will not worry you with cotton waste because you have expressed your views fairly clearly on that. Would you agree with this opinion? You would have thought it was most likely to be present around a dockyard? A. Yes, I would.

Q. And that, for the purpose of being used to ignite and float on the oil, it does not matter whether it is initially oily or not oily does it? A. I do not think so.

20 Q. Of course, having arrived there - I am not seeking to get anything out of your answer - if it is, in fact, oily when it is there, it is then more combustible; while it has more oil, the more combustible it is? A. Yes. It depends on the oil again. You would have to be more specific here. If it was petrol, it would be very much more. If it were asphaltic stuff, it would be less combustible.

Q. Less than petrol? A. Yes, and less than furnace oil.

30 Q. But if it is impregnated with furnace oil, when floating on the water, it is more combustible at that precise moment, that if it is not impregnated with any oil? A. I do not think so.

40 Q. You have dealt with cotton waste and I think you also dealt with hessian. Coming to some of these other agents, would you agree with me that a rag could be an ignition agent, floating on the water? A. I think provided the rag was big enough, was of the right texture, right material, and was capable of acting as a wick, yes.

Q. And if it was large enough and/or it was in a crumpled up condition, that would promote its value as a wick, would not it? A. I think it would be more efficient in that form, as an igniting wick.

Q. And the same, I put to you, would apply to newspaper floating on the water; if you had a

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
 1963.

Cross-
 Examination
 continued.

crumpled up piece of newspaper that could be ignited and serve as a wick? A. I am not sure about the wick effect there. I am not trying to be obstructionist, but I am having difficulty with the nomenclature. I am interpreting some of these terms rather different to counsel. It is a lack of communication which is basically at fault between us, I think.

HIS HONOR: Q. There has been a tendency to use the word "wick" simply as the equivalent of something which burns and may afterwards set fire to oil, but you would use it in a more restricted sense? A. A much more restricted sense.

10

MR. ASH: Q. You would agree, at any rate, that if you had some crumpled up newspaper and that was alight and was resting against a pile, that would be sufficient to start off the fire, if it remained in one place long enough, for a sufficient time, and the flame was sufficiently hot from the newspaper? A. Start off a fire on the pile?

20

Q. Yes. A. I think if the newspaper was a sufficient amount of newspaper and it burned for a sufficient time, it would have to set fire to the oil on the pile.

Q. Would you agree that a piece of wood burning on the surface, outside the water, would be sufficient, if it had a flame on it, to start the fire going? A. It would depend on the size of the flame and the length of time the wood was burning with that flame.

30

Q. But if it was burning sufficiently long, it could form the basis for this continuous flame? A. That is the postulation I have made all along, that those are the conditions.

Q. Well, would you accept that position? A. Yes.

Q. To sum the matter up on that aspect, would you agree that if the oil is there by itself, it does not constitute a fire danger, but if it is oil plus floating wicks, it is then a fire danger?

A. The whole situation is definitely much more dangerous from the fire point of view, oil plus wicks.

40

Q. In plain terms, if it is oil plus floating wick then there is a fire danger? A. That is the opinion I expressed before.

Q. And you would stick to it? A. I think it is a fire danger.

Q. We have been talking about flashpoints of 170 degrees fahrenheit. You would agree that, for the purposes of any opinions you have expressed in this and the other case, that range is not precisely 170, but goes from 150 to 190 approximately? Would you agree with that? A. Yes. I think that is correct.

10 Q. And indeed, I put to you that your views are the same if the oil on the water had a flashpoint up to 250? A. Yes.

Q. And indeed, if you got a bit of wind, up to 300? A. I think I will go as far as 300. The open air flashpoint that Mr. Meares asked me about in his examination in chief was 260 degrees fahrenheit, so virtually our oil had an open air flashpoint of 260 degrees, so that I should say that is probably the same for a closed flashpoint of 250.

20 Q. I put it to you that up to a flashpoint of 250, they would be substantially similar opinions on all these matters you have expressed? A. I think so.

Q. And as high as 300; the opinions would also apply if there was a bit of wind and the cotton waste thoroughly on fire? A. Yes. I think we would need bigger pieces of cotton waste and they would have to burn longer, with bigger flames.

30 Q. We have been speaking of dieselene. Would you agree that dieselene has a flashpoint comparable to that we are speaking of, between 150 and 170? A. Yes. I think that is pretty near it, without actually looking up any records.

Q. And it goes without saying that once we get the flame established on the water, whether the flashpoint is 150, 170 or 250, it no longer matters, once you get the established flame acting as a wick on oil on water? A. Once you have a long burning, do you mean, or once you have the oil on fire?

40 Q. You have the oil burning and starting to spread. Do you follow? A. Yes. You have the wick burning?

Q. Yes. A. And you have the oil burning.

Q. You have an agent, a flame floating on the water, established and burning for a sufficient time? A. Yes.

Q. Then at that stage, it matters not whether

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

the flashpoint of the oil if 150 or 300, does it?

HIS HONOR: Except that your sufficient time may change. You are postulating the sufficient time as if it were a sort of static condition.

WITNESS: That is right. He is trying to generalise, I think, too widely.

MR. ASH: Q. You would need a long time for the wick to remain effective as a flame, the higher the flashpoint of the oil? A. Yes.

10

Q. But the flame itself is what, 3000? A. The accepted temperature of most flames is about 3000 degrees fahrenheit, with the exception of oxy-acetylene flames.

Q. You would agree at once that the likelihood of that oil catching fire can be increased by a number of circumstances, cannot it? I am not leaving it in that general form. I am just asking you that first. A. It could be increased by certain circumstances, yes.

20

Q. First and foremost of those circumstances would be the thickness of the oil on the water? A. Yes. Going from the experiments I did, that would appear to be quite critical.

Q. I think you would agree that if you were asked whether any oil on water was a fire danger, the first inquiry you would make is the depth of the oil? A. That is what I said.

Q. And you would agree with that? A. I think I would ask that at the present stage too.

30

Q. Incidentally, the thickness of the oil is greater with a heavier oil than a lighter one, naturally? A. I am sorry. I do not know. With petrol, I can imagine it would be much thinner than say a heavy lubricating oil, but I am not a surface chemist and I would not like to give opinions.

Q. As far as comes within your knowledge, a light oil tends to spread more thinly than a heavy oil? A. It tends to spread more freely.

40

Q. More thinly. A. Yes, provided there is a great difference. I imagine it would be thinner.

Q. On this matter of measurement, were you in Court when His Honor was asking about some methods of calculation of thickness of oil on

water, for the purpose of experiments? Were you in Court when he was asking questions of Professor Kirov and of Mr. Parker? A. I remember the questions His Honor put to Mr. Kirov. I do not remember anything of Mr. Parker.

Q. You did, in these experiments prior to the earlier trial, get your thickness by calculations? A. Are we referring to Mr. Parker's evidence about the thickness gauge?

10 Q. Yes. A. I remember that.

Q. When you did these experiments prior to the 1958 case, you had ascertained your thickness on all these water surfaces, by calculation? A. No. We used the thickness gauge that Mr. Parker described.

HIS HONOR: Q. Point gauge? A. Point gauge.

MR. ASH: Q. I agree that this is not inconsistent with the answer given. You were asked:

20 "Q. Is there some scientific way of doing it or is it just done by calculation? A. Calculation is the easiest way."

Do you remember saying that? A. In this case?

Q. In the previous case? A. In what connection was I saying it?

Q. To ascertain the thickness of oil on water? A. It is the easiest way if you have enough information to carry out the calculation, but it is not the most accurate way. We used the most accurate way, the point gauge.

30 Q. At any rate, getting back to this thickness, of course in the context of this stage, the quantity of oil that was originally spilled is a material factor? A. A material factor to what?

Q. To fire risk, under the Sheerlegs Wharf. A. Yes, definitely.

Q. And of course, the wind would undoubtedly tend to thicken the oil under the Sheerlegs Wharf, would not it? I think you said that this morning? A. No.

40 Q. Would you agree that the effect of the wind and tides in that area, as you know it, would tend to thicken the oil under the Sheerlegs Wharf? A. No.

Q. Do you remember answering this to Kinsella J. :

"Q. I suppose, in certain circumstances, the

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

wind would largely confine spilled oil in a bay towards which the wind was blowing? A. Yes. That would affect the thickness very considerably"

A. I do not remember that.

T.G. Hunter

Q. Do you agree with that? A. I do not.

Q. You do not? A. No.

19th February,
1963.

Q. Why? A. I have learned a lot more about it since then. It would not.

Cross-
Examination
continued.

Q. Are you suggesting it would have the reverse effect? A. No. It would not have a damming-up effect, retaining and pushing the oil in and thickening it up. In order to thicken it up you would have to push it into the bay and decrease its surface area and increase its thickness. It would not have that effect. I am convinced I was wrong in that opinion.

10

Q. What particular experiment prompted you to that thought? (Objected to).

Q. Experiments or reading? A. Or discussions, my discussions with the Department of Physical Chemistry at the University of Sydney.

20

Q. You feel, to take it step by step, the wind would not have that thickening up effect towards the foreshores? A. No.

Q. Would the tide? A. No.

Q. Have no effect at all? A. No, other than the effect I have described, of emulsification and oxidation. You are not referring to that though.

Q. No. You put it this way, that if enough furnace oil spilled on the water, in Mort Bay, a wind blowing in towards the shore would have no effect on getting more oil near the shore than out from it and secondly, that the rising tide would not carry the oil in towards the shore. You are quite serious about that? A. It would carry it in towards the shore but it would not pile it up and thicken it. You did not ask me that. You said would carry it into the shore.

30

Q. You agree that it would carry it in? A. Yes, if it was freely flowing.

Q. Carry what in? A. Carry the oil slick in.

40

Q. On the surface of Mort Bay, on the example I am giving you? A. Yes.

Q. If it carries it in, that means it moves it from the centre of the bay towards the shoreline? A. Yes.

Q. If I start with the situation, a hypothetical situation, that light oil is evenly distributed over the bay, up to the shore, and if you get the tide and wind, as you say, carrying the oil from the centre of the bay into the shoreline - (Objected to).

Q. Then I have wind and tide carrying the oil from the centre of the bay to the shoreline? A. You have the oil all over the bay?

Defendants
Evidence

Q. At the start, before the wind and tide take effect. Do you follow? A. Yes.

No. 26.

Q. You told me the general effect of the wind and tide is to carry the oil into the shoreline, from the centre of the bay? A. Not if the bay is full of oil. You did not tell me that to begin with. You are not being specific enough.

T.G. Hunter

19th February,
1963.

Q. Let us postulate an even distribution of oil over the bay.

Cross-
Examination
continued.

HIS HONOR: Q. Extending from the shoreline out some distance into the bay but not covering, of course, the whole of the harbour. Have you got that set-up? A. Yes.

MR. ASH: Q. That is what you start with, an even distribution? A. Yes.

Q. Are you suggesting that the tide can have no effect on transferring some of that in the centre of the bay, to mount up on some of that near the shoreline? A. Yes.

Q. It cannot do it? A. No.

Q. If a man had given evidence in this case that when he saw the oil on the Tuesday morning, around about 8 o'clock, it extended out from the shoreline some - I have forgotten the exact number, it might be 20 feet, it might be a little more - right around the shoreline, and then thinned down to a rainbow film and then water, do you follow that situation? A. Yes.

Q. Four or five hours after the spill, you would be most surprised at that, would you? A. No not with that.

Q. Would not you? A. No.

Q. Could you tell me how, in your view, that could possibly have happened? Assume it was in that condition right around the wharf, up to Joiners Wharf? A. There was a layer of oil on the shoreline.

Q. Why would it go to the shoreline and not stay in a strip in the middle of the bay? A. I take it the wind and tides would take it in.

Q. Do you mean to say if you have a film of oil in the middle of the bay, not yet extending to the shoreline, and it is one-eighth of an inch in thickness, it will move in a body, like a floating circle of wood, until the nearest extremity of it reaches the shoreline and then it will stop, the whole distance of oil, point-blank, and no more will shift at all? A. Could I have the conditions again please.

Defendants
Evidence

No.26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Q. Let me take a circle of oil in the middle of Mort Bay? A. Yes. There is no other oil in Mort Bay, other than our circle of oil?

Q. That is so.

HIS HONOR: At the moment, this circle of oil is not impinging on any shoreline.

MR. ASH: Q. No. It is one-eighth of an inch thick the action of the wind or tide or either or both of them acts on that circle and moves it as a circle, not altering its dimensions, towards the shoreline. Do you follow? A. Yes.

10

Q. Hypothetically, a portion of the circumference of that circle will meet some object on the shore or building on the shore. Do you follow? A. Yes.

Q. Are you suggesting that when that portion of circumference hits that object or shoreline, the circle thereupon stays in that position until tide or wind removes it out? A. I say it stays in the same area, it occupies the same area. The area of the oil slick is the same, but we now have it pushed up against the shoreline.

20

HIS HONOR: Q. It might lose some of its circular shape, I suppose, on your view? A. Yes.

MR. ASH: Q. It might lose some of its circular shape? A. Yes.

Q. Why? A. Because oil is a fluid and it is spreading freely.

Q. In which direction? A. Laterally, on each side of the circle.

Q. Would it continue to go towards the shoreline at 30 other points, in addition to this one? A. I think so, yes.

Q. In fact, you might get to the stage where it would all go except for some 10 feet thickness up to the shoreline? A. I think you would get a lot of it, a lot of the periphery up against the shoreline.

Q. Having got it up there, imagine it is spread along 100 feet of the shoreline and is 10 feet deep. A. Yes.

Q. Do you say at that moment, notwithstanding the continuance of the wind and tides, it will stop say at a distance of 10 feet width of strip, and will not become thicker. A. Yes, it will not become thicker. It will not pile on itself.

40

Q. And although it will be in a different shape, it will still be one-eighth of an inch? A. Yes.

Q. The postulated depth at the start? A. Yes.

Q. I thought you did an experiment over the weekend, where you shook a pyrex dish with oil in it. A. Not over the weekend. It started yesterday.

Q. I thought the oil was coming towards the edges. A. Yes.

Q. Well, what would cause that. What, in those circumstances, if you had one-sixteenth of an inch of oil - A. Yes.

Q. - for one-third of the surface - A. Yes.

Q. Why would it get thicker near the edges? A. It did not get thicker. It got thinner. The whole of the dish was covered. It thinned.

10 HIS HONOR: Q. But you said, did you not, that later on it had contracted again? A. After the oxidation and emulsification had taken place, the oil had contracted back to its original area and it hardened and went into this plastic sort of material, I could pick it up with the pencil and hold it like that.

20 Q. But I was wondering what would be the effect upon the thickness of the oil layer, when it contracted once more? A. It contracted and oxidised and emulsified and the layer of the oxidised emulsion on the water now was much thicker than one-sixteenth of an inch. It was nearer one-eighth of an inch. But it was not oil at that stage. It was now oxygen-carrying and was something else. It had a rigidity which it did not have before.

30 Q. So that, on your view, the increase in thickness of the layer is not due to the piling of oil upon oil, but is due to the taking in to the oil of oxygen and water? A. That is correct, and altering its character. In other words, it was transferred from a fluid to a semi-rigid solid.

MR. ASH: Q. That occurred around the periphery of the dish? A. It occurred in the periphery, to start with, and throughout the whole of the oil on the surface of the dish.

40 Q. Anyhow, you have completely reversed your opinion since 1958, about this question of wind and tides. A. I said in 1958 I thought it would bank up to, I think the figure was one-quarter. Now I see the error of my ways and I say it would not bank up.

Q. You say it would not affect the thickness of the oil on the water, the wind and tide blowing into the bay? A. Provided no oxidation or emulsification took place, it would not affect the thickness.

Q. I think you said, in regard to the wind, that the wind of 11 mph would be very good for the production of a fire? A. I did not make any generalisation of that nature. I am sure I was specific.

50 Q. I will put it to you that you were asked this in the previous hearing, questions about the wind

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

velocity and the effect of wind velocities from the tests you did:

"Q. From the tests you did can you tell, can you say whether the wind velocity of 11 miles an hour that you took would you describe that as being ideal for production of a fire or a very bad wind velocity or what? A. Very good.

Q. For the production of a fire?"

A. Of this fire, yes.

HIS HONOR: Q. And for the production of fire in some of these experiments you carried out? A. Yes. It seemed to be a very favourable wind velocity. 10

MR. ASH: Q. Do you agree that the concept of the flame burning, being thrown over on to the water, is not 100% essential to the start of a fire.

HIS HONOR: Being bent over?

MR. ASH: Q. Yes, being put down on to the surface of the oil. A. As long as the flame is close to the surface or touching the surface of the oil, it is all right for starting a fire. How it is brought in does not matter. 20

Q. If it is in contact at the edges, then the wind is not essential? A. If you have a great long periphery of flame and it is in contact with the edges -

Q. Never mind the "great long". If you had quite a small periphery of flame on the water, assuming that it was an established flame in the sense that it showed no signs of deteriorating and it was some six inches, eight inches in diameter, a flame of that size established on the water through some burning object being in its centre, and still burning - do you follow? A. Yes. 30

Q. Then, as you say, you have the flaim in that situation, in contact with the water - A. Yes.

Q. And that would be sufficient, peripherally, to vapourise that oil and so cause expansion? A. I would have to do it. I did not do that type of experiment.

Q. Your general knowledge would enable you to say this, surely, that if the flame is in contact with the oil on the water, or so close to it that it is heating the oil on the water, that is sufficient to vapourise and cause the extension of the fire on the oil? A. For a long enough time, yes. 40

HIS HONOR: Q. The whole problem is whether it is heating it enough? A. Yes, I think so.

MR. ASH: Q. If you get a situation where it is heating it enough to expand, you do not need the bending down of the flaim? A. If it is heating it enough, you do not need to raise the temperature of the oil to the flash-point and bend it, but is it heating it enough?

HIS HONOR: Q. The problem with the small burning 50

object may be that it will not generate enough heat and will not burn for a long enough time to set fire to the surrounding oil, before it itself goes out? A. That is right.

MR. ASH: Q. You will agree that there are so many factors involved in this ignitability? A. A great number.

10 Q. And you would agree that the movement of the water has some effect on the situation, the movement of the water that you would expect on the edge of a harbour? A. Some effect on?

Q. On the likelihood of the oil or oil vapour becoming ignited? A. I do not know.

Q. You would agree that there is always movement of the water on the harbour? A. Yes.

Q. As regards the original ignition of the agent - do you follow me - the ignition of this floating object? A. Yes.

20 Q. Do you, in general, consider that, postulating a continuous film of oil on this water under the Sheerlegs, at the time of this fire, there was a fire danger? A. This is taking into account the operations which were going on up above that continuous film?

Q. That is a material factor, is not it? A. If there were no operations going on above it, of course there was nothing to set it on fire.

30 Q. Well, not something from those operations, true enough, but if there were operations going on above, the situation was one of fire danger, was not it? A. And it was just a continuous film of oil, there were no wicks or any potential -

Q. You have some floating objects, such as cotton waste and/or hessian and/or newspaper and/or bits of wood. A. You did not tell me that.

Q. If those things are floating about in any quantity at all? A. Yes.

40 Q. Then you have a potential fire danger under the Sheerlegs Wharf that day, have you not? A. I know that now. If I had been on the Sheerlegs Wharf that day, I would not have known it then.

Q. I will come to that later. You agree with me that when you were asked this precise question in 1958, when you were asked whether it was a

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
 1963.

Cross-
 Examination
 continued.

fire hazard, you said to me, "The fire hazard under those circumstances, depends on the habits of the people working on the wharf"? A. Yes.

Q. And that would be your view at that time and now? A. At that date, yes.

Q. What is the particular fact - there may be more - which you have ascertained between 1951 and 1957, which prompted you to give an opinion that you say you would not have held in 1951? A. I did not know anything, in 1951, about the possibility of a floating wick setting fire to oil layers on water.

10

Q. Is that the only link that your specific application to the problem, in the nature of tests and reading, filled in? A. And also the way in which that floating wick could be produced from, we will say sparks up above, an unlit wick. Suppose an unlit wick on the surface of the oil. I was not aware how easy that was to get alight by sparks. That is the extent of my reading at that time, and the extent of my knowledge at that time.

20

Q. Those are the two factors? A. Yes. This is in 1951.

Q. It is really a joint factor? A. A combination.

Q. The possibility of there being a floating wick being on the water, and the possibility of that wick being ignited from above? A. Yes.

Q. That is knowledge which you acquired between 1951 and the giving of evidence before Kinsella J.? A. That is so.

30

(Short adjournment).

MR. ASH: Q. Concerning this radiant heat, you said it is just like the sunlight, but it is much more powerful at that temperature? A. Yes.

Q. The heat of the flame, once it is there, however big it is, the flame radiates heat? A. Yes.

Q. And of course that vapourises the oil in the immediate area? A. If there is enough heat following it.

40

Q. 3000 degrees fahrenheit from a flame would vapourise some of the oil in the immediate vicinity? A. The radiant heat from that flame?

Q. Yes. A. But it is not at a temperature of 3000 degrees fahrenheit.

Q. But the radiant heat vapourises some of the oil? A. If there is enough of it.

Q. And of course, that is how the fire expands, by vapourising the oil; the oil itself does not burn, but it vapourises the oil, burns the vapour
A. Yes.

10 Q. And burns it down to the surface of oil itself? A. Yes.

Q. And that is how it expands, the fire, the flame? A. Yes. It is rather a loose way of putting it, but yes.

Q. On this thickness, you say that the winds and tides do not cause the oil to thicken against the foreshores? A. I think so.

20 Q. You quoted, in the last case, an example of where oil spilled in the open sea, spread out to one thirty-second thousandth of an inch? A. I remember it.

Q. And the reason that was, it covered some eight square miles or something. A. Yes, 15 tons of oil over eight square miles.

Q. And the reason why it spread out to that distance is because there was no obstruction to it spreading? A. It was spreading freely. It would have gone on spreading and spreading until it reached a mono-molecular layer.

30 Q. But the reason why it spread was because it had an open go? A. Yes.

Q. We have been told that some of the precautions of the Maritime Services Board are to put booms around oil, to contain it? A. And stop it from spreading.

Q. So that, if it is contained in the booms, it does not spread, except through the gaps in the booms, beyond the booms, and therefore a larger quantity of oil is contained in a smaller space than it would be if the booms were not there?
A. That is right.

40 Q. Withdraw the booms and get the effect of the wind and tide operating by pushing against the oil? A. Yes.

Q. Used as a containing agent, rather than the stationary boom. A. Yes.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Q. You can envisage that, can't you? A. It would not work.

Q. It would not work? A. No.

Q. Do you mean to say that the oil would continue to spread out, notwithstanding the tide and the wind giving it almost that effect? A. Yes.

Q. And therefore, if you had enough space, it would probably spread out to one thirty-second thousandth of an inch? A. Yes. If it did not, the Maritime Services Board would not need to contain it with a boom. 10

Q. So the wind and tide operating on this oil, against the foreshores, had no effect at all? A. I do not think so.

Q. None whatever? A. None whatever.

Q. Has it any pushing effect of the oil on the water? A. It is putting a force on it, yes.

Q. It must have, or it would not go against the foreshores? A. It is putting a force on the surface of the oil, yes. 20

Q. And the force is what pushes it against the foreshores, from the open water of the bay? A. It causes it to float along.

Q. And undoubtedly it is thicker around the foreshores than it would be if the foreshores were not there? A. Only by virtue of its oxidation and emulsification.

Q. I cannot yet follow it. Why does it go up towards the foreshores at all? A. Because there is a small force behind it, pushing it into the foreshore. 30

Q. Well, the wind and tide do have some effect on the edge of the oil it is pushing. A. It is pushing the whole of the oil, yes.

Q. If the wind got stronger, would not it push a little bit harder? A. Yes, I suppose so.

Q. And it would hold it there, would not it, for a time, against the foreshores. A. Yes. I think it would help.

Q. In effect, having a containing effect along that strip of the foreshores? A. A minor containing effect, yes. 40

Q. Apparently one that operated on these two or three days, because that is where the oil ended

up? A. Yes, because it was blown there.

Q. And contained there? A. No.

Q. Not contained? A. No.

Q. It all came out again, did it? A. Eventually. The spreading would have been decelerated by the force of the wind, but that was all.

Q. If it had been spread against the force of the wind to some degree, it remained thicker?

A. No. It did not remain thicker. It remained at its equilibrium height.

Q. So you have the picture of all the oil going into Mort Bay at 8 in the morning, and when the winds and tides receded, the whole lot came out again? A. I do not think it did that.

Q. Some of it stayed? A. Most of it stayed.

Q. On the water? A. Yes.

Q. By the way, you are aware, of course, of the surface tension figure of oil on water, are you not? A. No.

Q. You know that the surface tension of furnace oil is far less than the surface tension of water?

A. I do not know. Do you mean the surface tension between oil and water or the surface tension between oil and air, or the surface tension between water and air? The surface tension is a force which is acting at an inter-face.

Q. What about the surface tension of the oil?

A. There is no such thing.

Q. You do not know that the surface tension of furnace oil is far less than that of water. A. That statement is meaningless. Is it surface tension between oil and air or between oil and water?

Q. I am postulating, of course, air above.

A. Yes.

Q. Can't you envisage oil banking up itself, much more readily than water? A. No. I could not think of you putting a spoonful of oil out and putting out another and adding on to that until it built up.

Q. What was your reference to oil forming a lens - higher in the middle than the sides? A. Thicker in the middle than the sides.

Q. Why does the oil do that? A. I think again, that is the surface tension between oil and water.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

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Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Q. Well, you do know something about tension?
A. I know a little.

Q. Enough to understand why if the oil is fairly thin, it tends ultimately to go into lenses. That is your opinion, is not it? A. I think it is a surface tension effect there.

Q. And a lens means that it congregates in the shape of a lens? A. Yes.

Q. Instead of remaining in a very thin film all over the place? A. The whole of the thickness of the lens is thin, all over it. 10

Q. But it is thicker in the middle of the lens than the side of the lens? A. Yes. It could be a fraction of a millimetre.

Q. Did you give the opinion that a very thin oil surface on water, if left alone, would tend to go into lenses? A. I think it will.

Q. And lenses are thicker than the very thin surface, because they are areas where that thin surface congregates in spots over the water. That is right, is not it? A. I do not understand. 20

Q. If you have a thin film of oil on an agreed area of water - A. Yes.

Q. And you leave it there long enough, you express the opinion that it will tend to go into lenses? A. It will tend to break up into lenses.

Q. So that, although not precisely, but generally speaking, you have blobs of oil, in lens shape? A. Yes. 30

Q. And no oil, or very little, between the lenses? A. Yes.

Q. Why does that happen? A. Because of the surface tension effect between oil and water.

Q. Explain what that means. A. In this particular instance, if you can imagine -

Q. The instance of the lenses? A. With this lens of oil, there is a force pulling the oil outwards and there is another force pulling it inwards. Those are the surface tension forces. When those two balance we reach this equilibrium thickness. 40

Q. You seem to know quite a bit about surface tension of oil and water. A. I do not know your standards, but I would say very little.

Q. But what causes lenses? Is it mere surface tension which causes a lens to form? A. Yes, I think so.

Q. Why would the surface tension apply in the formation of lenses, and not on a continuous body of oil towards the foreshore? A. I would not agree with that. I think surface tension forces are always there.

10 Q. If it is always there, the reason why lenses are formed is because, basically, the oil surface tension is less than the water tension? A. It might be that or it might be the other way around. I would have to work it out.

Q. And if the oil surface tension is less than the water surface tension and that is one of the factors, why would not the same factor lead to a thickening of the oil near the foreshores? A. It does not follow.

20 Q. Why does not it follow? A. I cannot see what it has to do with it. In our labs. we had an equilibrium thickness. Whether the lens is floating freely on the surface of the harbour or part is anchored in the foreshores, we still have our equilibrium thickness, and the surface tension forces are acting on both and causing that thickness.

Q. If you have equilibrium thickness of a lens? A. Yes.

30 Q. I would have thought equilibrium thickness is even thickness? A. No. It means when the two forces balance themselves, it reaches a constant depth.

Q. Anyhow, the effect of it is to get it a bit thicker in the middle of the lens than at the sides? A. A wee bit.

40 Q. I want to get on to this ignition position. Apparently with these welding operations, going back to your set of 1957 tests, you got really, 100% success in the ignition of cotton waste through the falling molten metal? A. Through oxy-acetylene.

Q. It was from both? A. Yes.

Q. I do not expect you to remember all these tests and I am not going through them again, but you dropped the welding from various heights, ranging right up to 30'6"? A. Yes.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
 1963.

Cross-
 Examination
 continued.

MR. ASH: Q. Take test No. 13. Ignition of dry and oil cotton waste by oxy cutting in a wind velocity of 11 miles per hour. A. Yes, I have it.

Q. How did you ignite that again? A. The cotton waste was ignited by these sparks.

Q. From the oxy welding? A. Oxy cutting.

Q. You got 100 per cent return there? A. Yes.

Q. You further got ignition of the surrounding oil in every case? A. The oil ignited. 10

Q. No. 14 was a rather incomplete test. No. 15, dry cotton waste dropping 30 feet 6 inches. Wind velocity 1.6 miles per hour. You got smouldering in every case, and inflammation in a lot of cases. (No answer).

HIS HONOR: Q. That is No. 15. Ignition of dry cotton waste. Wind velocity 1.6? A. I have it.

MR. ASH: Q. You got smouldering in every case except the first, and inflammation in quite a number? A. Inflammation in 2 and 4 ... (interrupted). 20

Q. Yes. The first one did not ignite in 180 seconds. A. Yes.

Q. Do you remember His Honor, Mr. Justice Kinsella, asking you about that, saying that it could be misconstrued, that entry? A. Yes.

Q. You said the fact it did not ignite was due to the fact that by chance no pieces of molten metal from the electric arc welder landed on that cotton waste? A. That is correct. 30

Q. In effect, as His Honor asked you, it was not in fact tested, that piece, because nothing landed on it? A. I really thought whether it landed on it or not, it was part of the test.

Q. As part of the ignition? A. Yes.

Q. When you try it on oily cotton waste, No. 16, with height of drop 30 feet 6 inches, and wind 1.6 miles per hour, you got 100 per cent then? A. Yes.

Q. You got ignition then too? A. Of the cotton waste. 40

Q. That was not in oil? A. No.

Q. You were not suggesting in any of your answers to Mr. Meares this morning that the

dropping of it from 30 feet 6 inches was likely to lessen the chances of the cotton waste igniting, were you? By the lessening of the drop? A. I think it would. Six inches, or something like that. Parts tend to cool off the longer the passage through the air.

Q. Don't you recall in the previous case in your opinion it would ignite from 100 feet? A. I am sure I could get it to ignite from 100 feet.

10 Q. I will put the question that was put to you. "From your knowledge of this matter so far as heights are concerned, could you ignite cotton waste from an oxy-acetylene welding operation from much higher distances than 30 feet in fact?" Your answer was "I think you could ignite it from 100 feet." A. Yes.

Q. Do you agree with that? A. Yes.

20 Q. And it is much easier if the cotton waste is wet with oil, isn't it? A. The results of those two tables would suggest that.

Q. And the electric arc holder was also used in other tests? A. Yes.

Q. Do you remember Mr. Meares asking you this: "For the purposes of these experiments and the relevance of them, do you think there is any important difference between the use of a welding holder or an oxy-acetylene torch?" You said "I do not think so." A. Yes, I do not think so.

30 Q. Finally, you said, going back to the 30 feet, you assumed - and I will add oxy cutting - that welding from 30 feet that if sparks fell and happened to hit the waste, they cause it to smoulder. That was your conclusion? A. I think so.

Q. I think you would agree with me that the little sea water under the cotton waste, if it was lying on top, would be of no practical significance? A. Yes, the depth would not matter.

40 Q. Would you agree, knowing the facts you have made such a close study of, that the oil underneath the wharf that day was capable of being ignited? A. By.

Q. Capable of being ignited by a piece of cotton waste on the oil? A. Yes.

Q. I think you agreed with that yesterday? A. Yes.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Q. You were asked, "And you would regard it as being capable of being lit by a pile catching fire and burning with the oil around it". You answered, "I think it would". A. I think it might.

Q. "You agree that the circumstances existing under the wharf around the Corrimal on this day enabled this oil to be ignited?" You answered "Yes". A. Yes.

Q. Do you agree with that? A. Yes. 10

Q. Coming to the spread of the fire, I have asked you about how it depends to some extent on the thickness. Not to some extent. That is the first enquiry you have made. A. Yes.

Q. Would you agree with the conditions under the wharf that day, once ignited it would spread rapidly? A. I think it would spread under the wharf on that day, taking into account this wind tunnel effect. Once ignited it burns.

Q. That opinion on the tunnel of wind under there is, of course, the assumption by you from the data given you concerning the direction and speed of the wind? A. Yes. 20

Q. Have you actually seen the Yeend Street wharf at the eastern end of the Sheerlegs Wharf? A. I have no recollection of it.

Q. You know a little passenger wharf is there, don't you? A little ferry wharf? A. I must have seen it, but I do not remember it.

Q. You stated yourself for two or three hours before this fire there was a north-easterly? A. Yes. 30

Q. Here is the Sheerlegs wharf. (Indicating on map) A. Yes.

Q. That is about north-east? A. Yes.

Q. You see the direction of it? A. Yes.

Q. First of all, a north-east wind would be partially interrupted by the land on which Caltex Oil is situated, if that north-east wind was directing itself to the Yeend Street ferry wharf? A. Yes. 40

Q. Then if it is a north-east wind and had to get along under the Sheerlegs wharf in a westerly direction, it would have to turn round, wouldn't it? A. It would have to be slightly deflected.

Q. Deflected 45 degrees? A. There is no difficulty about that.

HIS HONOR: Is there not a difference as to magnetic north?

MR. ASH: Yes, there is a difference of about 11 degrees.

Q. You have a north-east wind coming, allowing for this 11 degrees, really straight across that direction. (Indicating on map). A. Yes.

10 Q. On what possible basis do you as a professor of chemical engineering assume that that same wind is going to go under the Sheerlegs wharf at 11 miles per hour? A. I would not like to say it is going under the wharf at 11 miles per hour. It may be less, it may be more. But it is certainly going under the Sheerlegs wharf. That is acting as a wind scoop.

HIS HONOR: Q. Which is acting as the wind scoop?

A. The tunnel between the wharf and the Corrimal.

20 MR. ASH: Q. When you said "acting as a wind scoop", you pointed to an area in the middle of the Caltex Oil area? A. There is the --- (interrupted).

Q. Do I understand the expression "wind scoop" to be something of the nature of a broad spoon, where you hit one side of the spoon and it is deflected into another direction by the spoon?

A. It is a pipe with a funnel-shape thing on the end.

30 Q. Can you tell me how any object on that map is going to deflect that north-east wind under the Sheerlegs Wharf? A. I think it would go under the Sheerlegs wharf.

Q. I am not asking you that. Can you point to anything on that chart to substantiate your view?

A. I do not think the object would be causing it to deflect, I think it would be the Corrimal and the wharf, and you have the tunnel there, and the wind would go down that tunnel.

40 HIS HONOR: Q. When it hit the structure and the Corrimal itself, it would be deflected? A. Yes, I think so, but on top of that there is also the chimney effect between the side of the Corrimal and the Sheerlegs wharf. There is a distance of 12 inches, I think one witness said. That would act as a sort of chimney and give you an upward draft.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

MR. ASH: Q. An upward draft? A. Yes.

Q. Would you agree that a north-east wind of 10 or 11 miles per hour is nothing extraordinary?
A. I would not know.

Q. You do not know? A. No.

Q. You have never made a study of the extent of winds? A. I am not an expert on that.

Q. This is a lay assumption of the effect of the wind on that tunnel, is it? A. I do not think so. I think it would be there. I have a certain amount of knowledge of these things. 10

Q. What is that based on? A. Being out eight hours a day fishing, and being about wharves and so on.

Q. It is the knowledge of a layman and not the knowledge of a chemical scientist? A. A practical layman.

Q. From the practical point of view of the science of wind movements you have no opinion except that of a layman, have you? A. Other than that the flow of fluids is a large part of chemical engineering. Fluids as used for both liquids and gases. 20

Q. The flow of fluids? A. Yes.

Q. Would you agree with me this tunnel of air has nothing to do with the flow of fluids? A. Yes, it has.

Q. What fluids is the tunnel of air concerned with? Not what it operates on, but the tunnel itself? What have fluids to do with that? A. Air is flowing through it. 30

HIS HONOR: Q. Air is a fluid? A. Yes.

MR. ASH: Q. You call air a fluid? A. Yes.

Q. You have made a study of the flow of air, have you? A. The flow of fluids.

Q. You have now told me air is a fluid? A. Yes.

Q. Have you made a study of the flow of air?
A. I have made a study of the flow of fluids, and that includes air, coal gas and all sorts of gases. 40

Q. Have you made a specific study of the flow of air? A. Yes.

Q. When? A. Throughout my 30 years of

professional practice.

Q. I suppose for the purpose of this case you can express the opinion if air has a wind behind it it will flow? A. A force behind it.

Q. That is what you have learned? A. Yes.

Q. You have not the slightest idea what the precise wind velocity, if any, was underneath that wharf on the 1st November, have you? A. I would hesitate to say what it was.

10 Q. You do not know. A. I do not think I know at all.

Q. If you do not know, you would not know therefore whether the wind at the moment the fire started was ideal or not? A. That depends if the fire started below the wharf.

Q. Assuming the fire started below the wharf, because you do not know what the wind was you would not know whether the wind was ideal or not. That follows, doesn't it? A. No.

20 Q. You have stated, and I can understand it, that you do not know what the wind was underneath that wharf at the precise moment the fire started? A. I could not tell you.

Q. You could not tell me that at all? A. Something in the nature of 10 to 11 miles per hour.

Q. Why do you say 10 to 11 instead of 7 or 13? A. Because at the time of the fire the meteorological reports say 10 or 11 miles per hour.

30 Q. You know that is the average of one hour before that time and after it, don't you? That is half an hour each way at a different portion of Sydney Harbour? A. Yes.

Q. Would you agree with me from a matter of commonsense that if that 11 miles per hour that you see there is given as the indicator, the average of wind speeds half an hour each side of that time at a different point of Sydney harbour, it would be impossible for you or me or any living man to say what the speed of the air under the Sheerlegs wharf was at a particular moment? A. Yes.

40 Q. And therefore it is impossible for you to say it? A. Yes.

Q. All I am putting to you is that you admit now you do not know what it was, because you cannot, and I am only putting to you if you do not know what it was you do not know whether it

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

was ideal for the propagation of a fire? A. I suppose that is the logical argument.

Q. You have given evidence here today or yesterday concerning the effect of a bit of cotton waste dropped on oil on water? A. Yes.

Q. I am going to read you something from what you swore on the previous occasion in 1958. Do you recall that during one day of the hearing Mr. Justice Kinsella was asking you questions about this matter, and you said "I do not know"? A. That is correct. 10

Q. Do you recall coming back later and saying "You asked me some questions yesterday about the cotton waste, while we are on the subject of wicks, and I was rather forced to answer you all the time that I did not know. I hope you did not think I was trying to be an obstructionist but I did not know. But I do know this morning"? A. Yes.

Q. Then you were asked to elaborate on your knowledge that morning? A. Yes. 20

Q. You said "I have done some experiments"? A. Yes.

Q. You were asked, "You have given some thought to it since, have you?" You answered "I have done some experiments." Do you remember that? A. Yes.

Q. You were asked, "What is the result of your experiments"? You said "I took an one-eighth inch layer of 170 flashpoint furnace oil on sea water and placed a 20 gram bundle of cotton waste on that. The cotton waste sucked up oil on the layer, the bottom part of the cotton waste penetrated the oil layer and went into the water, but had been coated completely with the oil and did not pick up any water at all, but remained completely dry in respect of water sucked up merely oil, and I left it floating for a period of 14 hours and it still contained only oil and no water"? A. Yes. 30 40

Q. Was that an isolated experiment? A. It was.

Q. An opinion given on one isolated experiment, was it? A. I gave the facts.

Q. Is that the only experiment you did? A. Yes.

Q. You did say, "I have done some experiments in this matter and I know now"? A. Yes.

Q. Had you then done several experiments to satisfy your knowledge? A. Yes, I felt so.

Q. Then this was not an isolated experiment?
A. It was a single experiment.

Q. It was the only one done at a particular moment, but not the only one done on this subject? A. At that time.

HIS HONOR: Q. You say it was? A. Yes.

10 Q. You used the word "experiments" in the plural? A. I think that was loose phraseology.

MR. ASH: Q. You are sure you only did one, are you? A. I think so.

Q. If that is the case, you pointed out it was done without wind or movement of the surface, and you say it was the only one experiment? A. I think so.

Q. The next question was, "Did you do any other experiments?" You answered, "Yes, I did a number". Do you follow? A. Yes.

20 Q. "I also took 20 grams of cotton waste and on it I had weighted previously 20 grams of oil and tried some experiments with the same result. It did not matter whether it was dry or oil cotton waste, we got the same effect." A. Yes.

Q. Do you recall now that you did some others? A. I do not remember doing them.

Q. What is there would have been true, wouldn't it? (Referring to transcript of 1958 proceedings). A. Yes.

30 Q. And you remember (interrupted). A. I would take that as being absolutely true.

Q. You made a special point of doing these tests because His Honor had particularly asked you what would be the effect of dropping waste on to oil covered water? A. Yes.

Q. And you went away to satisfy yourself? A. Yes.

40 Q. There was some doubt in the court as to whether this heavier bit of cotton waste was heavier because of itself or because it was soaked in oil, whether this would not go into this oil film or would go into the water. A. Yes, it must have.

Q. That is why you did these tests? A. Yes.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Q. You said, "I then took a heavier piece of cotton waste, 40 grams, which I weighted with furnace oil, and I dropped it on the quarter-inch layer of oil on water from a height of nine feet; and again we had the same effect. While the bottom of the cotton waste penetrated the oil layer it was already coated with oil and just retarded the water completely. I should say rejected the water completely"?

A. Yes.

10

Q. Apparently those tests gave a completely false impression of the position, is that right? A. I do not think so. Probably we had not done enough tests with enough variables to generalise.

Q. What sort of variations? A. Variations in the thickness of the oil and the height of the drop and in the quantity of oil on the cotton waste. Variations in the weight of the waste and so on.

20

Q. However, you had done enough to satisfy yourself that a 20 gram piece of cotton waste, whether impregnated with oil or not, dropped from nine feet, did not absorb water, or if it did, it was quickly retarded by the oil. That much you had established. A. The tests showed under the conditions described that is precisely what happened with the cotton waste, it only absorbed the oil.

Q. The conditions prescribed were that there was cotton waste of layers varying between one-eighth inch and one-quarter inch on top of oil on top of water? A. Yes.

30

Q. And that 20 grams not impregnated, and impregnated, and 40 grams impregnated, were dropped on surfaces? A. Yes.

Q. You did enough at that stage to satisfy yourself to come back and give this opinion to the court? A. Yes.

Q. And you made a feature of it, that you got the same effect? A. Yes.

40

Q. Then do you remember His Honor asked you, "Had you any purpose in increasing the thickness of the layer to a quarter of an inch"? You said, "No, just to try the effect of two different oil layers. I used a very much heavier piece of waste then and I dropped it from a height to see if it would penetrate the

layer and get any water from beneath. When it still did that it still rejected the water." Do you remember that? A. Vaguely. If that is the evidence that is what happened.

Q. I am reading precisely your words, you understand that? A. Yes.

Q. You were not asked to do these tests, were you? A. No.

10 Q. You went and volunteered, and you did them?
A. Yes.

Q. And you brought back the result with the intention of illustrating to the court what happened in these circumstances? A. Yes, and being able to answer the question I had been unable to answer before.

Q. You did a number of tests with various thicknesses of cotton waste and oil? A. Yes.

Q. Are you now saying those tests give a completely wrong picture? A. No.

20 Q. Do they give a correct picture? A. No, they give an indeterminate picture. I have to repeat a number of these tests gave entirely conflicting results.

Q. You did not get them in those numbers of tests? A. I did not get conflicting results on these.

30 Q. They all showed the same concept? A. I am getting conflicting results now. Sometimes I get the cotton waste to go through the oil, sometimes to stay for four minutes and sink, and sometimes give the results we had before.

Q. You can give no reason why that number of tests led to only one conclusion, and tests in this case with different considerations showed variable results? (Objected to - withdrawn).

Q. You can give no explanation why tests in those series of experiments in 1958 led to only one conclusion, and subsequent tests have varied? A. I can give no explanation.

40 Q. You used the same cotton waste, the same type, did you? A. No, I think that might have been one of the variables.

Q. We can assume in some respects it varied, because it did not come from the same pile? A. It is supplied six years later, and it looked altogether different cotton waste we were using

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
 1963.

Cross-
 Examination
 continued.

this time from the cotton waste we used in the past. I think it is pretty obvious this cotton waste must vary in its properties.

Q. That is an aspect of this case that has never been mentioned by you before, isn't it?
 A. That is correct.

Q. Is that the possible explanation of this discrepancy? A. That is one possible explanation.

Q. What is another? A. That the humidity might have made a difference. 10

Q. Of what? A. The atmosphere.

Q. The air? A. Yes.

Q. This test, as I understand, was - the recent set of tests were done within the last week, weren't they? A. Yes.

Q. What is the date today? A. 19th February.

Q. I can assure you that test was done on the 20th February. The test I read out. The series of tests I have read from the transcript of the previous case. I beg your pardon. I put it to you those previous tests I have described of dropping cotton waste on water in 1958 were done not in February, but on the 11th or 12th March?
 A. You could be right. 20

Q. You are not seriously suggesting that the humidity on that date in 1958 ... (interrupted).
 A. No, I think that is splitting hairs. I withdraw that. I was wrong there.

Q. What other factor? You have mentioned the possible condition of the cotton waste. A. I must confess I cannot think of any other factor except the properties and characteristics of the cotton waste. And that is a rather important conclusion, because it is obvious we can get cotton waste of entirely different properties, and we might be able to buy cotton waste that cannot be ignited like the last lot was, and it would be safe. 30

Q. What last lot? A. The lot used in 1951. 40

Q. Did you do any tests then? A. No. But the oil caught fire presumably from cotton waste in 1951. The cotton waste we used in 1958 and the cotton waste we used in 1963 could have altogether different properties from the cotton waste of 1951.

Q. Do you think as a matter of commonsense they had altogether different properties? A. I do not know. You suggested it, not me.

Q. You do not think so? A. I think there is a good deal of difference.

Q. And that would explain the difference in these tests, would it? A. These tests here, yes.

Q. I understand in this recent series you did get one going up to 14 hours? A. Yes, we did.

10 Q. On this question of oil remaining on the water and being in the same condition as regards burning and being ignited, or not being in the same condition after a period of two or three days - I am directing your mind to a change of subject? A. You are referring to oxidation.

Q. Oxidation and emulsification? A. Yes.

20 Q. Do you agree oxidation has been mentioned by you for the first time this morning throughout your entire association with this place? A. I think I mentioned it yesterday.

Q. Do you remember being asked this on 13th March 1958 by Mr. Taylor: "When I talk about fuel oil I am talking about fuel oil in your range of flashpoint. Would fuel oil retain its flashpoint for a period of time if it is put out on the waters of the harbour and lying underneath a wharf?" I am referring to the 170 range. You answered, "Yes". Do you remember being asked that question? A. No.

30 Q. Your answer was "Yes". A. It would retain its flashpoint.

Q. Do you remember that? A. I do not remember the actual question.

Q. Do you want me to show you it? A. I accept it.

40 Q. "There would be no alteration, I take it, in its capacity to ignite with the passage of time?" You answered that question, "Not in a matter of a few days, but in a matter of a month or two, yes". Do you remember that? A. If you say so, I said it.

Q. "That is because it would break up?" You answered, "It hardens up and the flashpoint definitely gets a little higher over a month or two, but in four or five days there is no alteration". Do you remember that? A. Yes, I have

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
 1963.

Cross-
 Examination
 continued.

said that.

Q. You were asked, "So far as it being a fire danger is concerned, fuel oil would be just as much a fire danger on the day it went into the harbour as it would be in four or five days time?" You answered "I would think so"? A. Yes.

Q. At the time you gave that evidence you had already given the court extensive details of your qualifications and experience prior to 1958, hadn't you? A. Yes.

10

Q. In your field? A. Yes.

Q. You claimed, did you not, in answer to questions, an extensive experience of fuel oil, its behaviour, its combustibility in all cases? A. Petroleum and petroleum products, I think.

Q. You have put yourself forward in both cases as extensively experienced in fuel oil, haven't you? A. No, I think you are mistaking it. Extensively experienced in petroleum and petroleum products. I have not had my experience confined to fuel oil and furnace oil.

20

Q. Is fuel oil a product of petroleum. A. Yes.

Q. You are not now saying that your opinion is to be played down in this particular case - I am not attacking your general knowledge - that your opinion is to be given less weight in this particular case because of your limited acquaintance with fuel and furnace oil? A. No.

Q. Do you still claim an extensive experience with fuel oil? A. No, I claim an extensive experience of petroleum. Petroleum has a lot of products. Gasoline, kerosine, fuel oil and so on.

30

Q. The greatest part of your life has been engaged in the refining aspect of petroleum? A. Precisely.

Q. Rather than its combustibility? A. Burning under a furnace, do you mean, or burning out in bulk?

Q. Take it generally. You are mainly concerned with the refining of petroleum rather than the combustibility of petroleum? A. And its physical products from a chemical point of view. Not an engineer's point of view, but a chemical point of view.

40

Q. You put that forward in 1958 as a weighty

and considered opinion based on your experience?

A. At that time, yes.

Q. You put it forward without any suggestion you might not be fully qualified to give it? A. I was qualified to give it.

Q. You felt then because of your extensive experience it was thoroughly correct? A. I thought so.

10 Q. And now in your evidence you have departed from it? A. I have extended my experience.

Q. You have sharply departed from the conclusion you gave Mr. Justice Kinsella, haven't you. A. I have, definitely.

Q. You state here now in effect two propositions: first, that as regards the residue of this oil left on piles and foreshores, it would be not readily ignitable? A. That is correct.

Q. And secondly that some emulsification took place that also makes it less ignitable? A. Yes.

20 Q. And you conducted this experiment in this Pyrex dish? A. That is correct.

Q. And you put a certain amount of oil on this water? A. Yes.

Q. And you have been in effect shaking it ever since? A. Rocking round the clock.

Q. The same Pyrex dish and the same water and the same oil? A. Yes.

30 Q. You realise there is a basic difference between that situation and the situation obtaining under the Sheerlegs wharf at the end of October 1951, don't you? A. Under the wharf, yes.

Q. And the basic condition is simple. You have not added any more oil to the Pyrex dish apart from the original filling? A. I do not think that would matter.

40 Q. You do not think it matters? A. No. I have to get a free spreading film in the Pyrex dish because we had a free spreading film under the Sheerlegs wharf. If I added more oil to the Pyrex dish I would have had the content laid out, which was not the situation under the wharf. I specifically filled one-third of the surface of the Pyrex dish so we would have a free flowing film.

Q. Were you in court when Professor Kirov expressed his opinion on one aspect of this matter,

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

namely that if any emulsification took place with the advent of new oil, either from its presence round about or being re-brought in with the tide, it would immediately destroy the effect of that emulsification? Did you hear that opinion expressed? A. I must have done.

Q. Do you agree with it? A. No.

Q. Do you tell me if I have a quantity of oil that has been shaken here for 24 hours and become partially emulsified, and if I put a large additional quantity of the same oil on that surface, it would have no effect on the emulsification of that surface? A. I would not have thought so.

10

Q. Do you know? A. I do not.

Q. You have indicated that the emulsification, if it took place, would take place round the fixed objects and foreshores. The extremities. A. The deposits would occur there, but the rate of emulsification would be greater on the fixed objects because of the risk of exposing fresh surfaces. But as I pointed out this morning, I was careful to use the words when I inspected the results of this experiment I was astounded to find not only had the emulsification taking place on the synthetic shoreline, but also on the part of the whole of the oil film of the dish to which no further oil had been added.

20

Q. You would describe what you were astounded at in the body of the vessel as not being oil? A. I described it as an emulsion.

30

Q. That is the body without the edge bits. That is an emulsion, not an oil, in your description? A. Yes. I could pick it up with a pencil, and I could not do that with oil.

Q. So because of the nature of it, which you describe as an emulsion it is clearly not oil? A. Yes.

Q. So reading your evidence yesterday we have another difference. "The material on the surface of the water between the wharf and the Corrimal would not have been floating asphalt or floating emulsion, otherwise it would not have burned. It must have been oil." A. Yes, that is correct.

40

Q. Getting to the other aspect of the asphalt coating round the piles and the foreshore - do you understand? A. Yes.

Q. You can assume we have been told by a number of people that in this bay there was a rise and fall of tide. A. Yes.

Q. And that the oil remained on the water under the Sheerlegs wharf. A. Yes.

Q. You would agree with me if those facts were so that with each falling of the tide there would be new oil going on all obstructions, including the piles? A. Yes.

10 Q. That is to say, no residue from the first tide, but new oil fresh from the water which you say must have been oil? A. Yes.

Q. So even if during the fall of the first tide there had been oxidation, and hardening, and sticky tar, whether it was there or not, the falling of the next tide would have coated the pile all over with fresh oil? A. Yes.

20 Q. Again that illustrates the importance of the continuity of oil supply in this context, doesn't it? A. The importance of what?

Q. First of all, you did not have tides in your Pyrex dish, did you? A. I had waves.

Q. You would say really you can visually watch oxidisation, would you? A. It is impossible to visually watch a chemical reaction, except one, and that is combustion oxidation.

Q. Oxidation produces heat, doesn't it? A. It does.

30 Q. And any heat tends to make hotter the surrounding objects, doesn't it? A. Yes.

Q. I asked you this morning just before we adjourned what factors made your opinion change between 1951 and 1957, do you recall? A. Yes.

Q. Broadly speaking, it was the cotton waste acting as a wick and the igniting of the cotton waste by the welding, wasn't it? A. That is right.

40 Q. I suppose you have known what cotton waste is since you were as high as this table? A. Not as far back as that, but a long time.

Q. And even as a student when you entered the chemical field, you would have known what you said yesterday, which I will read you from page , that the reason why cotton waste has the effect of smouldering is because it is made up

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
 1963.

Cross-
 Examination
 continued.

of very small fibres and exhibits a very big surface area? A. Yes.

Q. That would have been something you would have known from a very early age, isn't it?

A. Yes.

Q. And you would also know that material of that nature, particularly if called cotton waste, would burn if ignited? A. I knew it would burn.

Q. I suppose the only way you can get it to burn is to light it? A. I would have thought so. 10

Q. So you knew from an early age that cotton waste if lighted would burn? A. Yes.

Q. And you said here in this case, and in the other case, that it is common knowledge about this cotton waste around the wharf. -

MR. MEARES: I do not think he said that.

WITNESS: Not quite.

MR. ASH: Q. I will put the precise words. "You would have thought it was most likely to be present around the dockyard"? A. Yes. 20

Q. That is something you have known since you were quite young, isn't it? A. I should imagine so.

Q. I suppose since you have been very young you have also known that a substance like cotton waste will absorb oil? A. Yes.

Q. And you have also known since you were very young this cotton waste when ignited will burn as you say without oil, and it will burn if it has oil in it? A. I would think that is correct. 30

Q. And you have also known since you were very young that oil floats on water? A. Yes, most oils.

Q. Furnace oils? A. Yes, furnace oils. There are oils that do not.

Q. You have also known since you were very young that cotton waste would float on oil on water? A. I would have taken that for granted.

(Luncheon adjournment).

AT 2 p.m.:

Q. Would you agree with this statement: "Special care shall be taken to prevent sparks, slag or hot metal particles coming into contact with 40

mineral oil on water surfaces, particularly in the vicinity of wharves and ships"? A. It depends on the mineral oil. You would not need to bother about this one.

Q. This is a mineral oil. A. Yes.

10 Q. Would you agree with this, that "cases are on record where thin layers of oil discharged from ships or accidentally from tankers or water-side oil tanks have been ignited during cutting operations, even under severe winter conditions with ice on the surface of the water?" (Objected to - allowed). A. I do not know of any cases.

Q. You said yesterday that you had done extensive reading on this problem? A. Yes.

Q. And searching? A. Yes.

Q. You mentioned the Fisher Library? A. Yes.

Q. And other sources of information? A. Yes.

Q. As you said relating to this problem? A. Yes.

20 Q. Would you agree with me this problem concerns the fire danger of furnace oil floating on water under a wharf? A. Yes.

Q. One facet of it is the ignitability of waste from welding and burning operations. Debris. Waste or debris from burning or welding operations? A. Yes.

30 Q. Don't you think it might have assisted you to ascertain the view of those operating in the trade on welding and burning operations on this subject? (Objected to - allowed).

Q. Did you think it would assist you? A. I must confess I never gave it any thought at all.

Q. Precautions come into this matter, don't they? A. Yes.

Q. Do you think that the Standards Association of Australia Fire Precautions in Cutting and Welding Operations published in 1945 would have assisted you? A. I think they would.

40 Q. So that you may not be confused, and to be perfectly fair to you, the piece I read out to you came from that publication, paragraph 45, headed "Mineral Oil on Water Surfaces". -

MR. MEARES: What is the subject?

MR. ASH: The heading before that is "Wharves and

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Ships".

Q. This is published by the Standards Association of Australia. You are quite familiar with that body, aren't you? A. Yes.

Q. It is headed "Interim Rules for Fire Precautions in Cutting and Welding Operations," published in 1945. There is a sub-heading "Wharves and Ships". A. Yes. (Shown)

Q. The two pieces I read to you were published under "Mineral Oil on Water Surfaces". Do you see that? A. Yes. 10

Q. You would agree with the general knowledge of people conducting welding and burning operations and the proportions that were standardised in that trade six years before this event, would have been relevant in your reading, wouldn't you? A. I think they would be relevant.

Q. You say that you sought to find out fires caused by oil in your reading? A. Yes.

Q. Would a publication referring to 1314 fires over a 55 year period ending January 1st 1945 have been relevant? "Fires on piers and wharves"? A. I do not know. 20

Q. Would you agree with this, assuming that number, that "this extremely high average loss, which was 62,000 dollars per fire, is a reflection on the fire hazard conditions found in thousands of existing piers constructed with open wood piling sub-structures. Other features of piers which have resulted in consistently high losses include: failure to provide fire stops in the large areas; lack of access to the sub-structure for fire extinguishment; delayed detection of fire in concealed areas; the use of combustible materials in deck and super-structure construction; and exposure hazards, including ship fires and floating oil". That would have been most relevant, wouldn't it? A. I think it is relevant. It sounds familiar too. I think I have the book. 30 40

Q. It is a well-known book. "N.F.P.A.". A. I have it.

Q. That is the National Fire Protection Association. International. A. Yes.

Q. Published in America. A. Yes.

Q. A well-known handbook. A. Yes.

Q. The passage I read you was from the 10th edition in 1948. A. Yes.

Q. You will agree with me that such extracts as that - perhaps I should read the introductory section. It is under "Operation of Marine Terminals including Piers and Wharves". The preceding sentence is, "Losses in Selected Pier and Wharf Fires reported to N.F.P.A. Committee on Piers and Wharves have averaged 62,143 dollars per fire in 1,314 fires over a 55 year period ending January 1st 1945"? A. Yes.

Q. The reading that you indulged in was not exhaustive, was it? A. I have read both these documents.

HIS HONOR: Q. Do you mean the N.F.P.A. book and the "Standards Association Book? A. I have them both. I rejected the evidence of them as irrelevant, because they gave no information of the type of oil floating on the water. As far as it says there it could have been gasoline, petrol, anything. I also rejected "70,000 fires every year in Great Britain", because of lack of detailed information. 70,000 fires inside buildings in Great Britain, and 20,000 outside. That is 90,000 on an average to which the Fire Brigade attends, and because of the lack of information I felt it was quite useless to bother with any of them.

MR. ASH: Q. So you had that knowledge? A. Yes, if you could call it knowledge.

Q. I will read you what you said yesterday on this. "Mr. Meares: Q. I think you have searched, yourself, with assistance from the Fisher Library, for literature dealing with the problem of lighting oil on water?" You answered "Yes". You were asked, "Not tests? You have made a search for literature?" You answered "We have made an exhaustive literature search of all aspects of this subject". You were asked, "Have you obtained certain literature from different sources such as C.S.I.R.O. and elsewhere?" You answered, "On the subject of oil catching fire on water?" The next question was, "Yes". You answered, "There is practically nothing in the literature on this". A. That is right.

Q. You realised that could give the impression there was no record of fires being caused by oil floating on water, didn't you? A. I do not think there is any record. Q. How many of these thousands

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

of fires were caused by oil floating on water?
You tell me.

Q. I will read you one passage from this publi-
cation you have in your own library. "Other
features of piers which have resulted in consis-
tently high losses include exposure hazards,
including ship fires and floating oil". You did
not think that was relevant? A. No. I do not
think so now. Tell me how many of those fires
were caused by floating oil and how many with
furnace oil with a flashpoint of 170?

10

Q. Did you think this was relevant to tell His
Honor in the context Mr. Meares asked you? "Cases
are on record where thin layers of oil discharged
from ships or accidentally from tankers or water-
side oil tanks have been ignited during cutting
operations, even under severewinter conditions
with ice on the surface of the water". A. No.

Q. Nothing to do with it? A. I have rejected it
because it might have been any kind of oil. It
was not necessarily furnace oil of this flashpoint.

20

Q. That is why you rejected it, is it?
A. Naturally.

Q. From what you say you knew there had been a
number of oil fires on water, and you have known
that for a great number of years, and the fires
are in great quantity, but the fact you do not
know is what oil it was, is that what you are
telling us? A. An indeterminate number. You have
told me of a thousand fires over 55 years, some of
which were due to floating oil. Was it one, two,
three or a thousand? I could not say there was a
great number. I could not agree.

30

Q. Although you have not known the precise oil
in each case, you have known for a long time there
have been many many fires of some oil floating on
water? A. No, you have not read that out to me.
You have said a thousand fires due to a number of
causes. Am unspecified number from oil which
caught fire. Tell me the number.

40

Q. You knew there were some? A. Yes, there must
have been more than one.

Q. You have known that for a number of years?
A. Yes, I have heard of a few, that is all.

Q. You have heard of a few? A. Yes. I know of
two.

Q. But you know of others, don't you? A. No.

Q. 70,000 I thought you said, fires in Great Britain. Some of them have been oil burning on water, you said. -

MR. MEARES: He did not say that.

MR. ASH: Q. Are they? A. I took the 1958 figures. Reports from Fire Brigades in the United Kingdom. 51,992 fires in 1958 in buildings. Supposed cause of fires was as follows. "Ashes; brazier; camp fire; candle; chimney on fire; chimney; sparks from cooker; electric cooker; electric fire; heater or radiator.

Q. I do not want you to continue if you do not wish to. You are speaking of those particular fires. I will pass to another matter.(interrupted). A. I will have to finish in answer to your question. I will summarise it. Out of the total causes of fire given were 63 sources of supposed causes of fire given, and oil on water is not mentioned once.

HIS HONOR: Q. These are fires in buildings, are they? A. Yes. On the next page we have fires in the open air. The same number of causes are given. 49,920 for the year 1958, and I cannot find a reference to one which deals with either fuel oil or furnace oil or oil on water.

MR. ASH: Q. You have told me of these two publications in the library. Have you a publication as far as you know which says this: "Sparks from cutting and welding must be watched most closely to make sure they do not set fires. Sparks of this kind are really small globules of molten metal which are thrown out in a heavy shower, particularly in cutting operations, sometimes for distances of 25 or 30 feet. They hold heat for some time and readily ignite any light, combustible material with which they come in contact. They often start smouldering fires which are not discovered when the work is completed but which burst into flame later when no-one is present." A. It does not sound familiar.

Q. That is something which is well within your knowledge, is it not? A. I know that now.

Q. And you have known it for a long time? A. I have known it since 1957.

Q. This document was put out by the N.F.P.A. in 1943. A. Yes.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
 1963.

Cross-
 Examination
 continued.

Q. Have you it in your library? A. No.

Q. It is entitled, "Preventing Cutting and Welding Fires". A. No, I have not.

Q. Will you agree with me from the description I read out, that is to say "Sparks of this kind are really small globules of molten metal which are thrown out in a heavy shower, particularly in cutting operations, sometimes for distances of 25 or 30 feet", that would be a matter of general application if ignitable material was in the area. A. I should think so. 10

Q. Without specifically mentioning fuel or furnace oil or cotton waste, this would be relevant to your inquiry, wouldn't it? A. Yes.

Q. Do you see this photograph I show you? A. Yes.

(Referring to photograph in booklet "Preventing Cutting and Welding Fires").

Q. "A few second exposure of the camera shows how sparks from welding or cutting operations may travel considerable distances, often 25 or 30 feet, and roll and bounce across a floor. Innumerable fires have been started in combustible material in just this manner? A. Yes. 20

Q. That would not be something outside your knowledge before 1957, would it? A. It was.

Q. You noticed this, did you? "July 1943"? A. Yes.

Q. That is quite a nice picture of burning oil, is it not? (shown) A. Yes.

Q. Sparks from an acetylene torch used in the dismantling of a large freighter dropped into the oily waters of the Cuyahoga River in Ohio with this result". A. Yes. 30

Q. That is a spectacular illustration in 1943 of a fire caused by oil burning on water started by burning operations, isn't it? A. Yes.

Q. Did you at all apply your mind to the Port regulations of Sydney in your reading? A. I have not read them.

Q. Were you in court when a certain document was tendered before His Honor? A. I was not. 40

Q. There was a regulation dealing with cutting and welding operations on vessels, and one of them said that "Special care..... particularly in the vicinity of a vessel". That was published

in 1946. A. Yes.

Q. You have confined yourself to statistical numbers of fires obtained from certain books, haven't you? A. I have found the incidence of these types of fires. In order to be fair, I could have produced all these and said in 120,000 fires in 1958 not one of them is regarded as coming from oil on water.

10 Q. Will you agree with me this problem has some practical aspects? A. Yes.

Q. Would you agree with me in expressing opinions on the likelihood of a fire hazard of oil on water - I think you have already agreed that the views of those engaged in harbour control and welding might be relevant? A. With this fire?

Q. Yes. A. Yes, I suppose it would be relevant.

20 Q. Will you agree with me your statement of what you read yesterday really barely scratches the problem? A. No. These sorts of things have meanings. What do they mean? The Port Authorities of Sydney have regulations against sparks falling on mineral oil. What kind of mineral oil? They would not set fire to this mineral oil. It is far too sweeping. What value is it to me? None.

30 Q. I put to you two matters just before lunch about cotton waste. Do I understand you to say you knew nothing about the spread of welding globules on metal, and I include oxy burning, before 1957? A. No, I think that would be right.

Q. Did you know of the Cutter and Welder before 1957? A. Yes.

Q. Had you ever seen one in operation? A. Yes.

Q. You did know they spread? A. Yes.

Q. You did know they spread up to a distance of 20 or 30 feet at times? A. I did not realise that at that time.

Q. They spread a fair bit? A. Yes.

40 Q. You knew they were molten metal particles? A. Yes.

Q. You knew they could ignite combustible materials? A. Yes.

Q. You knew that before 1957, did you? A. I did not know specifically of igniting combustible materials.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Q. If I said to you they could ignite combustible materials, you would know they would? A. Some of them would.

Q. Including such combustible material as cotton waste? A. It would depend on the types of cotton waste.

Q. Some types of cotton waste? A. Some types. They would not ignite this furnace oil, which is combustible material.

Q. Rolled up paper would be another one? A. I would not have known before 1957. 10

Q. Hessian or rags? You would not have known that? A. No.

Q. This aspect of ignition of combustible materials is outside your sphere, is it? A. Ignitability is not outside my sphere, because I just did not know.

Q. You have not had occasion to make a study of it, have you? A. Not till 1957.

Q. It is more a practical problem than a scientific one, that particular aspect, isn't it? A. That is the only aspect I have been considering in this case all along. 20

Q. The scientific? A. No, the practical.

Q. I suppose you would agree as a general proposition the man in the field knows more about what is going on than the staff man sitting at base? You are a scientist, lecturing in a laboratory or lecture room primarily, aren't you? A. Yes, since 1927. 30

Q. You had some liaison contact, you say, with the attempts of the British authorities to put oil on the English Channel in the early days of the war? A. The Petroleum Warfare Department.

Q. The ignitability of any oil on the shores of the English Channel has no comparability with the ignitability of oils in Mort Bay, has it? A. I do not think I ever claimed that.

Q. You agree that is so, do you? A. Most decidedly, for the same reason I disagreed with you on the other matter. We do not know what type of oil was put on the English Channel. 40

Q. Apart from the type of oil, will you agree with it as a general proposition? A. Not as a general proposition, because we do not know the specific details of the two types of oil in

order to compare their general ignitability.

Q. You have sailed on the English Channel, have you? A. Yes.

Q. You have read about it? A. Yes.

Q. You have read about sea conditions that usually prevail in the English Channel? A. Yes.

Q. You know of the Bay of Biscay? A. Yes.

Q. As I understand it, this oil was intended to be strewn on the southern coast of England?

10 A. Just off the shore.

Q. Just off the shore of the southern coast of England? A. Yes.

Q. Portion of it that is lashed by the waves of the English Channel? A. I do not know about being lashed by the waves, but certainly exposed to them.

20 Q. Can you really say that these water conditions, irrespective of the type of oil, have any comparability to the almost still waters in Mort Bay, Sydney harbour? A. I could not even say they were not comparable, because we do not know the conditions under which the oil was spread in the English Channel. It could have been entirely on still days when there were no waves.

Q. If a decent average English Channel day came up, the oil would have been dispersed in every direction, wouldn't it? A. Yes. That was one of the reasons we discarded it. The second was it was difficult to ignite.

30 Q. I suppose torpedoes would have been a pretty good ignition agent? A. I would have thought so.

Q. You were asked yesterday about the vapours under the wharf. I think the mere presence of the vapours themselves lying on top of the oil in small quantities could be ignited by a falling piece of molten metal? A. Yes.

40 Q. What is suggested is that the spread of the fire would be more favoured by that situation than out in the open sea? A. Yes, if there were vapours there.

Q. There is always some concentration of vapours there, isn't there? A. I would say there is never any concentration of vapours there.

Q. What vapours are there would dissipate less quickly under that wharf than out in the open sea,

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Cross-
Examination
continued.

Re-Examination

wouldn't they? (Objected to).

HIS HONOR: The witness agrees in small quantities the vapours are there, Mr. Meares.

(Objection withdrawn).

MR. ASH: Q. The small quantities of vapours would be more likely to dissipate less quickly under that wharf than out in the open, wouldn't they? A. Do you think you are entitled to ask that question?

Q. Is it that you do not know? A. I do not know. 10

RE-EXAMINATION

MR. MEARES: Q. You did appear to draw a distinction between a wick and an igniter in a question that was asked of you, and you said you thought oil on a pile would act as an igniter. Do you want to add anything to that or explain in any way this expression? A. I felt a pile itself could not act as a wick, because it would not have this property of sucking the oil up from the surface of the water, and therefore could not strictly speaking be called a wick. Nevertheless, if there was a deposit of oil on that pile at low tide, and there had been a fire at the bottom, that oil would have thinned off and run down and fed the fire that way. And that was a possible igniter. Although it was not a wick. 20

Q. The assumption that the oil would have fed down, is that based upon the hypothesis that in some way the pile above the oil became ignited and then the flame ran down? A. In some way the pile near the bottom, near the oil level, must have become ignited. The oil on the pile near the bottom. 30

Q. Above the water? A. Yes.

Q. There has been some evidence given here that it is a very common thing to observe piles impregnated with oils in the harbour. Do you agree with that? A. I think it would be.

Q. You were cross-examined at some length as to the change in your opinions concerning the performance of this oil in Mort Bay over a period of two or three days, in the 59 hours preceding the fire. I think you indicated this was largely within the sphere of surface chemistry? A. Exactly. 40

Q. You informed His Honor you did not pose as an expert in surface chemistry? A. Most decidedly not.

Defendants
Evidence

Q. As far as this field is concerned in Australia, have you any idea of the number of surface chemists that there are in this country? A. I know of five, and there may be one or two more.

No. 26.

T.G. Hunter

Q. However, since you gave your evidence in 1957 or 1958, you have spent some considerable time with a surface chemist, haven't you? A. Yes.

19th February,
1963.

10 Q. And you have discussed the problem with him at considerable length? A. Yes.

Re-Examination
continued.

Q. And you are aware of certain experiments he has done? A. Yes.

Q. He has done some experiments at your suggestion, has he? A. Yes.

Q. Have you seen the results of those experiments? A. Yes.

Q. Have you had quite a number of conferences with him? A. That is correct.

20 Q. May I take it then that the opinions you have expressed have been to a large extent formulated as a result of your recent collaboration with this surface chemist in his field? (Objected to - allowed). A. That is right.

WITNESS: These discussions and conferences have generated a lot of extra reading on my part and a great deal of extra thinking. I think that is an important point.

30 Q. On this aspect? A. In consequence of that I have modified my opinion.

Q. You were cross-examined at some length upon the basis that you expressed an opinion as to what waste would do if dropped on water on which there was a surface of oil? A. Yes.

Q. I think he suggested to you that subsequently you made further experiments, and you agreed with that? A. Yes.

Q. Or had further experiments made? A. Yes.

40 Q. Firstly, from your own recollection, did Mr. Parker, commence those things independently of instructions from you, or on instructions from me or on instructions from you? Do you know how they originated? I am referring to the more recent tests. Mr. Parker told us he conducted certain tests. You and I were aware of them. Can you recall how they came to be done? A. They

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
 1963.

Re-Examination
 continued.

came into being as a result of Professor Kirov's evidence and we were attempting to check that.

HIS HONOR: Q. Do you mean his evidence about what was termed preferential wetting by oil?
 A. Yes.

Q. That sort of thing? A. Yes.

MR. MEARES: Q. There was a faint suggestion made you were trying to prove something that would suit you in some way. Was that so? A. I did not even get that suggestion. The results of these tests were quite puzzling. I made it clear in cross-examination we have got conflicting results. Very puzzling conflicting results.

10

Q. Mr. Ash put a question concerning whether oxidation would cause heat. Has that got any significance at all in relation to the combustibility of oil on water that was going through the oxidising process? A. No, the quantity of heat evolved in that type of process is very small.

20

Q. You were asked whether you spent a large number of years in the laboratory and lecturing and so on. You were in charge of the I.C.I. plant at Billingham on Tees, weren't you? A. Yes.

Q. How long were you there? A. Four years.

Q. In those works were welding and holders and torches used from time to time? A. Yes.

Q. In those four years did you ever hear of a fire from a welding torch or an acetylene burner?
 A. No.

30

Q. Then Mr. Ash speaks to you of the importance of Standards Association rules, and of regulations. You as a scientist have some knowledge of petroleum products, haven't you? A. Yes.

Q. If you went into a garage to get some petrol would you keep your engine running? A. No.

Q. Would you smoke? A. No.

Q. Would you look upon that as a very substantial danger, or a minimal one? A. consider it quite a serious one.

40

Q. This is because of your scientific knowledge, is it? A. And by a very healthy fear of petroleum from my experience in that field and my experience with fire.

HIS HONOR: Q. But you do not have to have a lot of scientific knowledge to have a respect for petrol, do you? A. That is correct.

MR. MEARES: Q. Insofar as the general generic expression "oils" is concerned, are there a matter of half a dozen different types of oils, or oils of varying flashpoints? A. I think that is answered by the five grades of the U.S. classification.

10

(Witness retired).

Defendants
Evidence

No. 26.

T.G. Hunter

19th February,
1963.

Re-Examination
continued.

No. 27.

EVIDENCE OF T. DURACK

THOMAS DURACK Sworn, examined, deposed:

MR. HOLLAND: Q. Where do you reside? A. Flat 8, 63 Carter Street, Cammeray.

Q. You are employed by Caltex Oil Australia Pty. Limited as Terminal Superintendent at the storage installations of that company at Ballast Point? A. Yes.

20

Q. Have you been 34 years with the company? A. All but two months.

Q. You have been Superintendent of Terminals at Newcastle, Brisbane, Melbourne and Sydney? A. Yes.

Q. Were you Superintendent at Ballast Point in 1951? A. Yes.

Q. Having commenced as Superintendent at that depot on 22nd October, 1951? A. Yes.

30

Q. In 1951 Ballast Point was a bulk storage depot for refined oil products, was it not? A. Yes.

Q. At that time fuel oils were not stored there? A. No.

Q. But they have been since that date? A. Yes.

Q. When did Caltex commence to store fuel oils such as bunker fuel oil at Ballast Point? A. It would be a guess, but I would say seven or eight years ago.

40

Q. In your experience in Newcastle, Brisbane, and Melbourne, and any other part of Sydney with the company, have you had experience with bunker

No. 27.

T. Durack

19th February,
1963.

Examination

Defendants
Evidence

No. 27.

T. Durack

19th February
1963.

Examination
continued.

fuel oil? A. Not prior to that.

Q. Had you had experience with other fuel oils?
A. Not bunker fuels, no.

Q. Do you recall the vessel Waggon Mound arriving
at the Caltex wharf, Ballast Point, on 29th October,
1951? A. Yes.

Q. I think she sailed next day, on 30th October?
A. That is correct.

Q. Your company, Caltex Oil Australia Pty. Limited,
was at that time the local shipping agent for the
ship, is that so? A. Yes. 10

Q. When the Waggon Mound arrived, I think there
would have been some oils already in storage on the
shore installation? A. Yes.

Q. Can you give us some idea of the quantity of
refined oil products that would have been stored
there at that time? (Objected to as being irrelevant.
Allowed). A. Without the actual figures I cannot
say exactly but I would say one-third full, which
would be in excess of 1,000,000 gallons. 20

Q. What was the storage capacity of refined oils?
A. Slightly over 4,000,000 gallons.

Q. That would have included a substantial quantity
of gasoline, wouldn't it? A. Yes.

Q. Principally gasoline? A. Yes.

Q. And the Waggon Mound discharged into the shore
installations its cargo. Can you tell us what was
contained in that cargo? A. Three products. Gaso-
line, kerosine and automotive distillate.

Q. Do you recall coming to work at the depot on
the morning of the 30th October? A. Yes. 30

Q. A Tuesday? A. Yes.

Q. About what time? A. Approximately 7.15 a.m.

Q. You had another employee by the name of
McAnally? A. Yes.

Q. What was his capacity? A. Shipping foreman,
responsible for the handling of all bulk tankers.

Q. On your arrival about 7.15 that morning, did
he make a report to you? A. Yes.

Q. That there had been a spillage of oil? A. Yes. 40

Q. What did you do? Did you inspect it? A. Yes.

Q. What did you find? A. Bunker oil on the fore-
deck of the Waggon Mound, on the hull and on the

water.

Q. Whereabouts on the water? A. Underneath the Caltex wharf, drifting towards Morts Dock along the foreshores.

Q. Did it cover the full extent of the water immediately under the Caltex wharf? A. No, it was in patches.

Q. How long was the Caltex wharf? A. Nearly 200 feet.

10 Q. What proportion of that 200 feet would have been affected by oil coverage? A. I could not determine that. You could not see right underneath the wharf, you could only see sections of the water. There were bare patches.

Q. Was the ship tied up alongside the same length as the wharf, or longer or shorter? A. Much longer.

Q. Did the oil extend between the ship and the foreshore as far as the bow of the ship? A. Yes.

20 Q. How far towards the stern did you observe it? A. It was not quite down to the stern. It would be probably 100 feet from the stern of the ship.

Q. In your observation of what was under the wharf, in point of quantity, was it large or small? A. It is very hard to determine. There were patches of this oil. The tide was running in and it was breaking up all the time into patches. I could not tell you quantities.

30 Q. Looking towards Morts Bay from your wharf, could you see how far the oil extended? A. No, I could not see anything. My vision was limited to the end of the Sheerlegs wharf. I could not see any further than that.

Q. Could you see to the Yeend Street ferry wharf? A. Yes.

Q. Had it extended that far? A. Yes.

40 Q. How far out from the shore line? A. At the time I saw it it would not be more than a few feet out from the shore line. It was closely in.

Q. Were you able to tell what its thickness was? A. No.

Q. Having seen the oil what was the first thing you did? A. I rang the Assistant Harbour Master and reported the spillage.

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

Q. That is at the Maritime Services Board, is it? A. Yes.

Q. Tell us what you told him. (Objected to - Mr. Holland stated this goes to what reasonable steps were taken - rejected).

MR. HOLLAND: I take it Your Honor's rejection of the evidence does not go to the fact that the person to whom the report was made has not been identified?

HIS HONOR: No, it is not on that ground. 10

MR. HOLLAND: Q. What did the Assistant Harbour Master say to you? (Objected to - rejected).

Q. Did you immediately after ringing the Assistant Harbour Master go on board the ship? A. Yes.

Q. Did you have a conversation with the Master? A. Yes.

HIS HONOR: Q. You have already given some description of seeing a spillage of oil on the ship itself. Had you seen that from the wharf before your telephone call, or did you see that only after you went on the ship? A. Before the telephone call. 20

Q. The telephone call occurred before you yourself went on to the ship? A. That is correct.

MR. HOLLAND: Q. You had a conversation with the Master? A. Yes.

Q. After that did a launch approach the ship from Goat Island? A. Yes.

Q. Was there on board that launch a Maritime Services Board officer whom you knew? A. There was an officer. I did not know him. 30

Q. Could you identify it as a Maritime Services Board launch? A. Yes.

Q. Did you have a conversation with him. A. Yes.

Q. Tell the court what conversation you had with that officer. (Objected to).

HIS HONOR: It occurs to me if this man gave the witness instructions as to what to do, or on the other hand instructed him not to do something, that might have some bearing on the question whether what was done or omitted from then on was reasonable. 40

MR. ASH: I submit it could not absolve the

defendant from anything, whatever was said.

10 HIS HONOR: I agree if the Maritime Services Board man told him to do something silly and he went ahead and did it, he could not escape a charge of negligence merely because the other man told him. But the whole problem may not be as simple as the illustration I just gave. I think this is a little different from any man who happened to be passing by on the harbour giving him some advice on this, because what has to be done there is to a degree

20 MR. ASH: I see what Your Honor means. I submit anything that was said by the Maritime Services Board officer would not be evidence of what the Board thought should be done or should not be done. It may be that that particular officer acted wrongly. Mr. Durack did not know who he was. His capacity is unknown. I object to it as being the view of the Maritime Services Board.

HIS HONOR: I have some doubts about this, but I think I will admit this evidence.

MR. ASH: My objection is to the status and competence and position of the particular officer, and it cannot bind the Board.

HIS HONOR: I will allow the evidence.

30 MR. HOLLAND: Q. Tell His Honor the conversation you had with this Maritime Services Board officer. A. The only conversation I had with him was to ask was there anything we could do or should do.

40 Q. Try and put it in the first person, will you? A. I said to him, "What has to be done? What does the Maritime Services Board require? Will this affect the ship's sailing on scheduled time?" He replied "There is nothing I can see that can be done now, and as far as I can see there is nothing to prevent the ship sailing on schedule".

Q. Shortly after that did another Maritime Services Board launch arrive with a Captain Craven? A. That is correct.

Q. Who was the Harbour Inspector? A. That is correct.

Q. And a Mr. Litherland? A. Yes.

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

Q. The Board's legal officer? A. Yes.

Q. And you and another officer of the Company, Mr. Smith, went with Captain Craven and Mr. Litherland to the Master's officer? A. That is correct.

Q. Tell His Honor what conversation took place on the ship in the Master's Office. A. Captain Craven told the Master that he would be responsible, and was liable to pollution of the harbour, and he would have to appear in court. I then asked Captain Craven would they allow ... (interrupted). 10

HIS HONOR: Q. Try and put it in the first person, will you? A. I said to Captain Craven "If Caltex are prepared to accept the responsibility on behalf of the Master, will you allow the ship to sail on scheduled time?" He said, "Provided the Master will furnish you with this authority, yes."

MR. HOLLAND: Q. Was there any other discussion that took place? A. There was a discussion trying to investigate what had happened. The Master gave his version of it. That discussion took place between the Master and Captain Craven. 20

Q. Were you present while Captain Craven was there in the Master's office? A. Yes.

Q. Did you observe whether Captain Craven examined the spillage? A. Yes.

Q. Did he? A. Yes.

Q. How long were they there altogether? A. It is hard for me to remember now. I would say at least half an hour. 30

Q. During the whole of that time was there any suggestion on the part of anybody that this oil represented a fire danger? A. No.

Q. Somewhere about this time had you gone to the Yeend Street end of the Caltex property and observed some oil under the Sheerlegs wharf? A. That is correct.

Q. How far were you able to observe under the Sheerlegs wharf? A. A matter of 20 feet to 30 feet was as far as I could see. 40

Q. What was the condition of the oil under the wharf? A. There was oil present on the water. It was broken. It was not a complete coverage. It was broken up, and mainly around the piles.

Q. Did you know that the Corrimal was tied up at the Sheerlegs wharf? A. Yes.

Q. Did you know what was going on with respect to the Corrimal? A. No. I assumed repairs.

Q. Did you know the nature of the repairs? A. No.

Q. Had you seen any oxy welding or burning going on at the time? A. No.

HIS HONOR: Q, You had not? A. No.

10 MR. HOLLAND: Q. Would you have expected that such operations would have taken place from time to time? A. I could not answer that.

Q. Tell me from your observations what kind of oil this appeared to you to be. A. Bunker fuel oil.

Q. What was your view about it as to fire risk? (Objected to - allowed).

Q. What was your view about it as to fire risk? A. In my opinion there was no fire risk.

20 HIS HONOR: Q. You are speaking, I suppose, of your opinion as it was at that time? A. At that time.

MR. HOLLAND: Q. Why? What was your reason for that opinion? A. Several reasons. One, I have been associated with oil terminals for many years, and I had never heard of or seen any fire from fuel oil on the water. I had been told by various other people that this did not constitute a fire risk. (Objected to).

30 HIS HONOR: If the relevant inquiry is as to what the Waggon Mound's officers or agents, having regard to the actual state of knowledge of those particular men, should have foreseen, I think clearly you could get this. But if the relevant inquiry is an impersonal and objective one, that is to say what would the hypothetical reasonable ship's officer and/or agent have foreseen, there may be logical difficulties about admitting this evidence. Which is the correct test or approach
40 on your submission, Mr. Holland?

MR. HOLLAND: There are two questions that arise. One goes to the existence of the duty of care, and the other goes to the standard of care if the duty exists. As far as the standard of care is concerned, a defendant is bound to act upon his own knowledge, and it is relevant for evidence to

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

be led as to his actual state of knowledge, which might put him in a different position from the ordinary man.

HIS HONOR: I will hear Mr. Ash as to whether we are confined to an objective inquiry or whether the actual state of knowledge and information in the possession of the actual defendant is a material factor.

HIS HONOR: I will allow this evidence. If, by later legal argument, I am persuaded that the actual state of information possessed by the defendant or the defendant's representatives is irrelevant, then I shall, of course, ignore this evidence.

10

MR. HOLLAND: Q. I was asking you your reasons for expressing the view -

MR. ASH: Perhaps it could be noted that Your Honor is allowing it on the basis of him representing the defendant.

HIS HONOR: Yes. The evidence which is sought and to which objection is taken, is evidence as to the knowledge and information possessed by the witness, Mr. Durack, bearing upon the opinion which he says he formed as to the absence of fire risk. I am allowing him to be asked not only a question as to what his opinion was, but also questions as to the reasons for it, and I think that that evidence is admissible and may be relevant, because he was the superintendent of a company which became or was the agent of the defendant company. I think that fact, that I have just mentioned, may make this evidence relevant and material, whereas the like evidence from a witness who was not thus identified with a party to the case, might not be relevant.

20

30

MR. HOLLAND: Q. I was asking you your reasons for your view, and you had said you had never heard of such a happening, and then you said you had been told something? A. I had been told by various other people in similar positions to me in other companies, in other ports, who had more experience of black oil spillage than I had. Subsequent to that, I discussed it with my shipping foreman, Mr. McNally, who also had more experience in bunkering than I had.

40

Q. When did you speak to Mr. McNally about this? A. When he reported it to me.

Q. What view did he express to you as to the

fire danger, as to the existence or otherwise of a fire danger? (Objected to; allowed, as going to information witness had on this subject). A. He expressed the same opinion as I had, that is, that he did not consider it a fire risk.

Q. Have you any knowledge at all as to the ability to ignite this oil? A. Not on water.

10 Q. What was your state of knowledge as to the ability to light the oil on water? A. I had no knowledge of the ability to light fuel oil on water.

HIS HONOR: Q. Am I right in thinking that you yourself, from your own experience, did not really have any knowledge either way? A. That would be correct.

20 Q. Either knowledge that it could be ignited, was hard or easy to ignite, or could not be ignited? A. From my own knowledge, I knew it was very hard to ignite. I did not know how it could be lit.

MR. HOLLAND: Q. Having discussed it with Mr. McNally on the morning when you saw it, did you then refer to the Caltex Laboratory? A. I did.

Q. I think at the Ballast Point installation, Caltex maintains its own laboratory, does it not? A. That is correct.

Q. Is that laboratory conducted by chemists? A. Yes.

30 Q. And did you speak to one of the chemists in the Laboratory about it? A. Yes.

Q. What was the chemist's name? A. Bransgrove.

Q. To your knowledge, how long had he been chemist in the Caltex Laboratories? A. He had been in the laboratory from approximately 1931 or 1932.

Q. What work was done in those laboratories? A. Various tests. I am not competent to explain all of them.

40 Q. I do not want the technical details, but what kind of work? A. I suppose you would describe it as testing of petroleum products. (Objected to).

Q. For what purpose did you, in the course of your job, refer to the laboratory? A. In connection with this, do you mean?

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

Q. Yes, with this and other matters. For what purpose did you refer to the laboratories? A. They do all the testing of our products. In the case of a ship discharging, they must test products before they are discharged, to satisfy themselves the quality is correct and afterwards, they test the tanks to make sure there is no contamination, and they are continually testing our products in manufacture.

Q. Did you discuss this spillage with Mr. Bransgrove? A. Not from the point of view of spillage. 10

Q. From the point of view of fire risk? A. From the point of view of fire risk.

Q. What opinion did he express? (Objected to; allowed). A. He expressed the opinion that it would be almost impossible to set fire to fuel oil on water, on such an expanse of water.

Q. I take it Mr. Bransgrove had been actually at the Caltex terminal at Ballast Point, for some time? A. Many years. 20

Q. Following these discussions with Mr. McNally and Mr. Bransgrove - Mr. Bransgrove died about two years ago? A. Yes.

Q. But Mr. McNally is still with us? A. He is retired.

Q. Following these discussions with those two gentlemen, I think you reported the fact of the spillage to your head office? A. Yes.

Q. Did you get any directions from your head office to do anything about it? (Objected to). 30

HIS HONOR: Q. Where is this head office. A. In Sydney. It was, at that time, at 62 Margaret Street. It is now in Caltex House, Kent Street. (Not pressed).

MR. HOLLAND: Q. Did you do yourself, anything at all, with respect to the spillage under your own wharf? A. No.

Q. Did you consider there was any necessity to take any precautions or other steps to guard against fire in your own installation? A. No. 40

Q. On this same day, did you receive a telephone call from Captain Simpson, the Acting Harbour Master? A. Yes.

Q. Concerning this spillage? A. Yes.

Q. I want you to tell His Honor what Captain Simpson told you (Objected to; allowed).

Defendants
Evidence

10 Q. What did Captain Simpson say to you? A. He said, "I have received several complaints from owners of various types of craft around Balmain, to the effect that their craft have been fouled by fuel oil, and I have informed them that the Maritime Services Board is not responsible and will do nothing for them. Any further complaints will be referred to you." He further asked me then would I see him in his office the following morning, to discuss the proposition.

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

Q. Was there any discussion of any kind, or any suggestion on the part of Captain Simpson, concerning a fire danger? A. No. (Objected to; rejected).

20 Q. I do not think you remember for sure, but it was either that day or the next day that you received a call from a Mr. Parkin, the works manager of Morts Dock? A. That is correct.

Q. Do not answer this unless my friend does not object. What conversation did you have with Mr. Parkin? (Objected to; not pressed).

Q. You had a conversation with Mr. Parkin, did you? A. Yes.

Q. Following that conversation, did you go around to Morts Dock with Mr. McNally, and see Mr. Parkin? A. That is correct.

30 Q. I think you had some further conversation there? A. Yes. He told me - (Objected to).

Q. Did you make an inspection? A. Yes.

Q. What did you see? A. There was oil on the slipways. There was an accumulation of oil in front of the dry dock and there were -

Q. This is Morts Dock? A. Yes, and there were further traces of oil underneath the Sheerlegs Wharf.

40 Q. To what extent did this oil that you saw extend out into the bay, if at all? A. At that particular time it did not extend to the bay. It was in a pocket, right in the corner.

Q. In the corner of what? A. In the corner of Mort Bay.

Q. On the day following the spillage, the Wednesday, did you see Captain Simpson in his office? A. Yes.

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

Q. As arranged? A. Yes.

Q. Would you tell His Honor what conversation took place between you and Captain Simpson on that occasion? (Objected to; allowed as before).

A. Firstly, Captain Simpson asked me what had happened, what transpired, and I told him.

Q. Say what you said. A. I said that whilst the "Waggon Mound" was receiving bunkers from the Vacuum Company's barge, a spillage occurred. ~~I questioned the Master and was told by him that a valve had jammed~~ - (Objected to; not pressed; latter part of answer struck out by direction).

10

Q. You gave him an account of what had happened, as far as you knew? A. That is correct.

Q. What happened then? A. Then I said to him, "Is there anything the Board can do to disperse this product?" He said, "No." (Objected to). We then had further discussions on ways and means of dispersing this oil and no conclusion was reached.

20

Q. Could you give us the content of the conversation, what he said to you and what you said to him, as far as you recollect it? A. As I recall, I firstly asked him what had been his experience in Sydney Harbour, in dispersing this oil. He said they had not had a lot of experience; they had, on occasions, put a boom around the ship or around a spillage, to contain it in the one area, but he could offer no suggestions to me as to how to disperse it, even if we did collect it in one area. He discussed overseas principles in operation, which I believe were in operation with the use of carbon sand, but he said to me at the time, "There is no carbon sand in Sydney, therefore there is nothing we can do about it." and to the best of my recollection, that was where the conversation finished.

30

Q. There was nothing else said between you and Captain Simpson on this occasion? A. I cannot remember anything else.

40

Q. I think the next thing that happened, so far as you were concerned, was that on the Thursday, 1st November 1951, at about 2 o'clock, you rang Mr. Parkin? A. That is correct.

Q. And in the course of ringing him, you observed the fire? A. That is correct.

Q. Your office there, at the terminal, is elevated, is it not? A. That is correct.

Q. Would it be as high as the bridge of the "Wagon Mound" or higher? A. Much higher.

Q. From that office, what view do you have of the Sheerlegs Wharf and of any vessels or activities going on there? A. I could see the upper part of the ship. You could not see the Sheerlegs Wharf.

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

10 Q. You mean the top decking? A. The super-structure. No, that is not possible to see from my office.

Q. Had you, in fact, observed any mast or anything of the sort, lying on the wharf, prior to this spillage? A. I had not been on the wharf.

20 Q. I want you to compare your sight, or the position of your vision of this Morts Dock area, from your office, with what it would be from the bridge of the "Wagon Mound", where it was moored, or would it be possible, from the bridge of the "Wagon Mound", to see on to the Morts Dock wharf? (Objected to).

Q. Were you on the bridge of the "Wagon Mound" at all? A. No.

Q. Have you been on the bridge of ships similar to the "Wagon Mound"? A. Yes.

Q. Similar height? A. Yes.

30 HIS HONOR: Q. When they were at the Caltex wharf? A. Yes.

MR. HOLLAND: Q. On more than one occasion? A. Yes - not prior to the "Wagon Mound", subsequent to her.

Q. What view do you say is attainable from the bridge of a ship comparable to the "Wagon Mound", tied up at the wharf? A. You can see a corner of the Sheerlegs Wharf.

Q. Which corner? A. The one immediately adjacent to the Yeend Street Ferry Wharf.

40 Q. What distance down the wharf? A. I could not imagine that.

Q. Approximately? A. Approximately I would say 40 or 50 feet.

Q. At the time of this spillage, were there

Defendants
Evidence

No. 27.

T. Durack
19th February,
1963.

Examination
continued.

some buildings at the end of the wharf, the Yeend Street end, that are not there now? A. Yes.

Q. What buildings were there? A. I do not know. There were sheds of some description on the wharf, but I do not know what they were.

Q. Up to what height, approximately? A. 12 or 15 feet possibly.

Q. Would they obstruct the view of any activities going on on the wharf, even to the part of the wharf you could see? A. That I could not remember. 10

MR. ASH: There is a matter which should be mentioned before 4 o'clock, about a subpoena, because it may be relevant to proceedings tomorrow. My solicitor served a subpoena on Caltex Oil Ltd. It is possible Mr. Durack may be able to assist in this matter. Certain documents have been produced. A similar subpoena was served in the earlier case, but certain documents were claimed as privileged, by Caltex Oil. The subpoena is wide enough to cover all documents whether then privileged or not then privileged. My solicitor informs me that a cursory look at the documents which have been brought to Court on the subpoena shows that they do not include what I will call the privileged section. I will want those documents to examine, before cross-examining this witness, and it may be that he, as an officer of Caltex, can assist in having them here in the morning. Whether my friends can assist, as agents of the company, I do not know. I understand that Caltex Oil, who came to the previous hearing and were represented to fight the question of privilege, they, as I understand, then being imperilled, took away the privileged section and left the unprivileged in Court, and they cannot be found. 20

HIS HONOR: Which cannot be found? 30

MR. ASH: The unprivileged.

MR. MEARES: If my friend had mentioned this to me I might have been able to assist. This is the first I have heard of it. I could have done something about it, possibly. I do not know. Could we see the copy of the subpoena? 40

MR. ASH: Certainly.

HIS HONOR: I cannot handle it really, unless an appropriate officer of the Caltex Company is called on the subpoena, and we do it in a formal way.

MR. MEARES: I will try to help over the adjournment, if I am given the subpoena.

MR. ASH: The witness may have known and may have been able to assist.

HIS HONOR: Are you suggesting that some papers previously produced may have become mislaid or lost?

MR. ASH: Yes. They were brought on subpoena, but His Honor ruled that this section need not be produced, and they were taken home.

HIS HONOR: Are those the ones not now available?

MR. ASH: Yes.

HIS HONOR: I should have thought - I will simply say - that if a proper subpoena was issued, all the documents covered by the descriptions in the subpoena ought to be brought to Court and then, if there is any claim of privilege, it ought to be made then.

MR. HOLLAND: Q. When I was asking you previously about your views as to the dangers, if any, of fire from this oil on water, I also asked you whether you knew what activities were going on on Sheerlegs Wharf. Assume that there had been and was being carried on, on the Sheerlegs Wharf and on the Corrimal, during the period this oil was there under the wharf and alongside the Corrimal, oxy-welding and burning operations of the type that one would expect in ship repairing. Would that have made any difference to your opinion as to the liability of fire occurring? A. No.

Q. And on the occasion you inspected, with Mr. Parkin, the oil in Mort Bay, at the Sheerlegs Wharf, were you aware of any oxy-welding or burning being carried on? A. Yes.

Q. You were aware? A. I was.

HIS HONOR: Q. It was not actually being carried on at the time you were doing the inspection, was it? A. I do not think so.

Q. But you were aware that it had been in operation? A. That is correct, yes.

Q. Since 1954 your company has been storing bunker oil at Ballast Point? A. That is correct.

Q. From which ships have been bunkered. A. That is correct.

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

19th February,
 1963.

Examination
 continued.

Q. And into the tanks at Ballast Point, has bunker oil been received from tankers bringing it as cargo? A. Yes.

Q. When bunkering of ships or the receiving of bunker oil from ships into the shore installations is the only operation going on, are the fire precautions taken on the Caltex wharf, any different from when lighter fuel oil, such as gasolene and kerosene and dieselene are being discharged or loaded? A. The standard safety precautions are carried out at all times, but, with black oils, we do not insist on the same rigid control of vehicles in the area. 10

Q. I think in the case of the lighter refined oils, if I can call them that, including kerosene, gasolene and things of that sort, vehicles are prohibited? A. On the wharf, that is correct.

Q. Watchmen are posted? A. Yes.

Q. There is a pipeline patrol? A. Yes.

Q. And there is a foreman supervising constantly? A. That is correct. 20

Q. Are any of those precautions taken where you are bunkering a ship with bunker oil, or receiving bunker oil into your storage tanks from the tanker? A. The only one, I would say, that we do not insist on, is the vehicles on the wharf. The other is routine and is a standard practice on discharge, irrespective of whether it is refined oil or black oil.

Q. With regard to this oil that was under your own wharf, were you interested, during the time it was there, from the point of view of the safety of your own installations? A. I was not concerned. 30

HIS HONOR: Q. What about after the fire at Sheerlegs had occurred and some fire damage was done to the Corrimal? I suppose there was still some of this oil under your Caltex wharf, was there? A. Very little.

Q. Very little there at the time? A. Only what was adhering to the piles. 40

Q. I was going to ask you whether after the fire had occurred, you became concerned in a way in which you had not been previously concerned, about a possible fire risk? A. No. There was not sufficient.

Q. There was not enough oil there to worry about? A. There was not enough there to worry about and, in any case, we would not, in that area, at any time use fire.

Q. You would not be having any oxy-cutting or welding or the like? A. No. That is normal practice in the plant, that we would not do it there, whether there was a ship or oil or anything around the place.

10 (Further hearing adjourned until 10 a.m. on Wednesday, 20th February 1963).

Defendants
Evidence

No. 27.

T. Durack

19th February,
1963.

Examination
continued.

IN COMMERCIAL CAUSES

Nos. 3000 & 3001 of
1955

CORAM: WALSH J.

THE MILLER STEAMSHIP CO. PTY. LIMITED -v-
VACUUM OIL CO. PTY LTD CALTEX OIL (AUST) PTY.
LIMITED and OVERSEAS TANKSHIPS (U.K.) LTD.

R.W. MILLER & CO. PTY. LIMITED -v- SAME.

ELEVENTH DAY: WEDNESDAY, 20TH FEBRUARY, 1963

20th February,
1963.

20 CORRECTIONS:

P. 319 Line 31: "heavier" should be "lighter".

P. 359 Line 42: insert "tank" after "overflow"

P. third last question: answer struck out,
by direction.

THOMAS DURACK

Examination continued:

30 MR. HOLLAND: Q. Yesterday, I asked you to give an account of the conversation you had with Capt. Simpson on the Tuesday, the day on which you observed this oil spillage, and you gave that conversation. Was that the whole of the conversation? A. As far as I can recall, yes.

Q. I just wanted to ask you this. I did not ask you anything about flash points. Do you have any knowledge of the significance of the flash point of an oil? A. Yes.

40 Q. Have you carried out any tests yourself from time to time? A. Many years ago I did quite

Defendants
Evidence

No.27.

T. Durack

20th February,
1963.

Examination
continued.

Cross-
Examination

a considerable amount of flash points; on kerosene, not on fuel oils.

Q. So you knew what the process of such a test was, and its purpose? A. Yes.

Q. In 1951 what did you know, if anything, as to the flash point of bunker fuel oil? A. All I knew at that time was that it was well in excess of 150 degrees closed flash, but as to the actual flash I would not know; It would be somewhere in the vicinity of 175 or 180, but other than that I had very little knowledge of the flash point of fuel oil. 10

CROSS-EXAMINATION

MR. ASH: Q. Do you remember when you said you went around to see Mr. Parkin? A. Yes.

Q. You did not go on the sheerlegs wharf, did you? A. I cannot remember whether we actually went up on top of the wharf but we inspected underneath the wharf from the slipway end.

Q. You cannot say whether you went on to the sheerlegs wharf at any time. A. I cannot remember going there. 20

Q. If you went, you certainly did not go back again on to the sheerlegs wharf? A. No.

Q. And when you went to inspect underneath the wharf I take it that you saw the oil on the piles of the wharf? A. Yes.

Q. Because the tides had fallen and left the oil coating on all the piles? A. That is correct.

Q. And you saw it also, I take it, on the foreshores? A. Yes, on the foreshores. 30

Q. Under the wharf? A. Some under the wharf, yes.

Q. And around the wharf? A. In the vicinity of the wharf, yes.

Q. On the foreshores, either side of the wharf, as well as under it? A. Yes.

Q. You saw it there, you saw the oil there? A. I saw some oil there, but the "Corrimal" was berthed alongside the sheerlegs wharf and there was no oil on the outside of the "Corrimal".

Q. You did not look whether it was on the foreshores underneath the wharf, behind the "Corrimal"? A. As far underneath as I could see, yes. 40

Q. But you could not see into the foreshores?
A. The sea wall?

Q. Yes. A. Yes.

Q. Did you see the oil on that? A. Yes.

Q. The sea wall does not go the full length of the wharf. Did you see it on the shore part, where the wall was not? A. That is outside the wharf?

Q. Partly outside and partly under.

10 HIS HONOR: A. No. What is suggested is that there is a retaining wall type of thing along a great deal of the shore where the wharf is, but not extending the whole distance of the wharf, and that then there is some natural foreshore? A. It was my opinion that the wall extended the full length of the wharf.

MR. ASH: Q. Well, you did not know? A. No.

20 Q. You would not know whether the foreshore at the end of the wharves, was covered with oil or not? A. Some of it, yes.

Q. But you do not know how much? A. On the slipway.

Q. But getting around nearer the wharf? A. No, I could not say.

Q. You did not look? A. I must have looked, because I was there.

Q. But you cannot say now? A. No, I cannot remember it.

30 Q. You say you have been in charge of a number of fuel installations for Caltex? A. Not fuel installations.

Q. Well, storage installations, storage of fuel oil? A. Yes.

Q. And I suppose you would know the great care that has to be exercised in and around those installations, with regard to oil? A. Inflammable oils, yes.

40 Q. But you know, don't you, that there are most stringent regulations covering the use and control of all oil within installations? A. That is correct.

Q. And the reason for those stringent precautions is fire danger? A. To a point, yes.

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

20th February,
 1963.

Cross-
 Examination
 continued.

Q. Well, it is the major reason, is not it, for all the precautions? A. It depends on the type of plant.

Q. I am talking about any oil storage plant. Do you agree with that? A. Yes.

Q. You know, don't you, and I am going back to the days before the fire, of the Standards Association Code for fuel installations? A. Some of it I know.

Q. Well, you know it exists? A. Yes. 10

Q. And you know, don't you, that it has a most stringent list of provisions about the storage of all sorts of oil in tanks, fire precautions and allied matters? A. Yes.

Q. And you have known that, I take it, for a long time? A. Yes.

Q. You would have known of the section of it dealing with precautions against fire? A. I do not know that one.

Q. Do you mean to say you have never known it? A. Not on that code, no. 20

Q. Did you ever hear of precautions such as these - and in fairness I should say this is not under the heading "Precautions against Fire" - in relation to an overflow pipe, they shall be so arranged that any discharge of oil shall be visible to the operator filling the tank, or a suitable alarm or indicator shall be fitted to give warning when the storage or service tank is filled to its rated capacity; where an overflow pipe terminates other than in a tank, the ends shall be sealed with an approved flame trap? A. Never heard of it. 30

Q. That, of course, would indicate to you fear of fire by the drafter of these rules, would not it? A. Yes.

HIS HONOR: Q. You said yesterday, when asked a question about receiving bunker oil into the shore installations, "The standard safety precautions are carried out at all times, but with black oils we do not insist on the same rigid control of vehicles in the area? A. Yes. 40

Q. You used the expression, "standard safety precautions". Did you mean those just customary in your own company, or were you referring to something set out in a book? A. No. That is

instructions or regulations laid down by our own company, and they are based on other regulations.

Q. Your own company's instructions to its employees? A. Yes.

MR. ASH: Q. (Approaches witness): Do you see the pamphlet I am showing you, S.A.A. Code for Fuel Oil Installations, 1950? A. Yes.

10 Q. You will see here, the people entrusted with the preparation of it, and the last one is "Oil Companies"? A. Yes.

Q. And it takes in the Navigation Department, the Navy Department and others. You would surely know that those regulations contain a special notice that has to be given, to keep away fire when any tank is open? Do you know that? A. No. I do not know that code.

Q. Have you not ever seen it? A. No.

20 Q. And you have been in charge of installations on behalf of Caltex, for how long - 28 - ?
A. 26 years.

Q. And you have never seen this? A. No.

Q. Have you ever heard of it? A. I have heard of it, yes.

Q. Have you ever asked for it? A. No.

Q. From your hearing of it, you know that it is directed to stringent precautions concerning the control of oil, having regard to fire danger? A. That is correct.

30 Q. And having heard of it, you have known that for some time? A. Yes.

Q. It follows that you knew, that you must have known that there was, in the opinion of these Standards Association people, a danger whenever oil of any sort covered by these regulations, was spilt? (Objected to).

Q. (Approaches witness): I show you the same book, Part I, para. 1, "Scope", do you see?
A. Yes.

40 Q. "The rules of this code shall apply to the design, construction, operation and maintenance of installations for the storage and application of fuel oil having a closed flash point of not less than 150° fahrenheit" - not less

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

20th February,
 1963.

Cross-
 Examination
 continued.

than? A. Yes.

Q. That would include, from your knowledge of flashpoint, fuel and furnace oil, would not it? A. That would, yes.

Q. Since, as I have said to you, you have heard of these things and you know what they are about broadly, and you have known that for some time, you would agree with me that it would indicate to you that the framers of these rules envisaged fire danger if there was a spill of oil? (Objected to; allowed). 10

Q. You would agree with that, would not you?
 A. I agree with that, but I would like to make it clear that that was not a fuel oil installation.

HIS HONOR: Q. Where you were? A. At Ballast Point, at that time, it was not a fuel oil installation.

Q. And you would suggest that that is a reason, perhaps, for being less acquainted with these rules than otherwise you might have been? A. That is correct. 20

MR. ASH: Q. At all events, there is a number of close fire precautions adopted at Ballast Point? A. Yes.

Q. As a matter of routine? A. Yes.

Q. And they have been, for a long time? A. Yes.

Q. Even from the moment you came there? A. Yes.

Q. And the only alteration made in respect of furnace oil of this type is that you allow the vehicles to come inside? A. On the wharf, yes. 30

Q. From those general regulations, it is obvious to you that the risk of oil spilling and leading to possible fire is a very prominent matter in the conduct of your place?
 A. That is correct.

Q. And has been, always? A. Yes.

Q. That being so, you, with your experience would have had always present in your mind, would not you, that when oil is spilled there is a likelihood of fire? A. That would depend entirely on where the spillage occurred. 40

Q. Do you mean to say that if the spillage

occurred anywhere in and around the ballast point place, on shore, you would be very conscious of the fire risk, on shore? A. On the shore, yes.

Q. And the reason why you would be conscious of it would be because, firstly, there was, in fact, a spillage of oil; and secondly, that on shore there was a fire risk. That is right, is not it? A. That is correct, in certain areas.

10 Q. For instance, you would have been conscious of this type of thing - I am talking about the shore only now - that "no oil shall be allowed to accumulate in save-alls, gutters or any other part of the boiler house or furnace room?" A. That is correct.

Q. "All fire extinguishers shall be maintained in good order and shall be systematically tested at frequent intervals"? A. That is so.

20 Q. And care taken in the removal of pipes and tight connecting up of pipes and that sort of thing? A. Yes.

Q. Wherever the pipes were? A. That is right.

Q. So that it is a very important thing, so far as the shore is concerned, to you, at all times to see that there is no spillage anywhere around your shore area? A. Yes, that is correct.

Q. Because of the risk of fire? A. One of the reasons, but not the only reason.

30 Q. Well, for years you have known that if there is a spillage in and around the place, on the shore, there is a risk of fire. You have known that? A. In certain areas, yes.

Q. In any area on the shore, or the wharf, - you have known there is a risk of fire? A. Depending on the product. With fuel oil in certain areas, no risk.

40 Q. And you say that, notwithstanding what I read to you from this code, that this shall apply to fuel oil having a closed flashpoint not less than 150°? A. Yes.

Q. You would agree, would you, with the wisdom of taking all these precautions that you do take, even though the flash point is a flash point over 150°? A. Yes.

Q. And you agree that the precautions are

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

directed against fire hazard, to a large extent?

A. To some extent, yes.

Q. Well, if you agree with that, you will agree you knew, at all times, there was some risk of a spillage of furnace oil on shore, from fire?

A. On shore, in certain areas - where specifically it states there in boiler rooms.

Q. I read to you one concerning furnace rooms. You really mean then, that you do not think there is any danger in the spillage of furnace oil on parts of Ballast Point, on the shore, other than furnace and boiler rooms? (Objected to).

10

Q. Do you now say that? A. That is what I mean as an example, that there are other parts of the plant, where there are welding shops and machine shops, but in isolated compounds where there may be a spillage there is no danger.

Q. You think there is a danger in welding shops? A. Yes, surely.

Q. Have you had that view for some time? A. No. Yes, I have had that view that, at all times, any liquid at all, any lubricating petroleum products should not be where there are flames.

20

Q. In any liquid or petroleum products you include, of course, fuel oil? A. Yes, now.

Q. And because of what you said you, at all times, you say, had the view, fuel oils included, not only, should not be included where there is any burning going on, flames? A. I do not say at all times. I had no experience with fuel oils until 1951, when I went to Ballast Point. My experience had all been confined to highly inflammable products.

30

Q. At all events, since you became acquainted with fuel oils, you now have the opinion that they should not be released in any place where there is burning going on? A. That is correct.

Q. And welding? A. On the shore.

Q. To get it perfectly clear, since you came in contact with fuel oils, you have realised they should not be brought, in a special fashion, anywhere where there are welding operations going on, on shore? A. That is my opinion, yes.

40

Q. And you formed that opinion as soon as you came in contact with fuel oils for the first time? A. No.

Q. You took it up later? A. Later.

Q. And of course, the danger from fuel oil, as you know it now, any fire danger, if brought into contact with any welding or burning, depends of course on the quantities spilled, does not it?
A. That is true.

Q. And the more that is spilled the more the danger if burning or welding operations are at hand? A. Yes.

10 Q. You of course have been familiar, for a long time, I take it, with the welding operation?
A. In a general sense, yes.

Q. You have known, for years, what electric welding is? A. That is true.

Q. And oxy burning? A. That is true.

Q. And the nature of it, that it throws molten sparks sometimes quite widely, but at all events showers of sparks and molten metal, during the operation? A. Yes.

20 Q. You have known that in your ordinary knowledge? A. Yes.

Q. And you have known that for a long long time? A. Yes.

Q. And you would know that anything such as molten metal that has come off the welder or oxy burner, is very hot? A. Yes.

Q. In fact, it is molten, you know that?
A. Yes.

30 Q. And you would know that if it hits something combustible it would start a fire or at least a smouldering? A. Well, I assume so, yes.

Q. That has been part of your assumed knowledge, in your own mind, for quite a number of years?
A. That is correct.

Q. Getting back to before the fire, the period you were there before the fire, you have already agreed with me, that these general fire precautions applied to all oils? A. Yes.

40 W. And they have not been changed; they still apply, although you now keep bunker fuel there?
A. That is correct.

Q. Would you indicate the type of precautions you take in your own organisation, out at Ballast Point? A. In what operation?

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

20th February,
 1963.

Cross-
 Examination
 continued.

Q. In connection with fire precautions?

MR. HOLLAND: In 1951?

MR. ASH: He says they are the same as in 1951.

WITNESS: Our operation procedure is the same. We have fire extinguishers. We have fire hydrants. We have sand bins. We have a water pump there, a booster pump to give us the pressure, and regular fire drills are carried out. All men are instructed in procedure in case of fire. Our equipment is tested regularly, once a month, and there are limited areas where smoking is allowed.

10

Q. And foam extinguishers? A. Foam extinguishers, dry powder extinguishers.

Q. And all that applies in respect of all the oils? A. In respect of the whole plant, yes.

HIS HONOR: Q. You said something yesterday about a pipe line patrol? A. That is in the discharge of a ship. Whilst the ship is pumping we have a man patrolling the pipeline, just to make sure there are no leaks developing.

20

MR. ASH: Q. As I understand it, you said yesterday, that when you arrived at Ballast Point in 1951, you had no knowledge either way of the ability to light fuel oil on water? A. That is correct.

Q. I take it that you certainly knew or assumed that fuel oil could be lit on land, by an appropriate means? A. By an appropriate means, yes.

Q. Fuel oil - its very nature is to burn? A. Yes, but you cannot light it with a match. 30

Q. You knew that, did you? A. I knew that, yes.

Q. When did you find that out? A. Over a period of years.

Q. In what circumstances? A. Again, I must repeat I can only rely on the judgment of other people.

Q. You have not tested it yourself. A. No. I have not tried it - I had not. 40

Q. But you knew it could be, as you said. As regards the oil on water you told His Honor yesterday that you were not worried about what was left after the fire, under your own wharf. Do you remember that? A. Yes.

Q. And the reason why you were not worried about it was that there was not enough to worry about, and in any case, "We did not, at that time, use fire". That is what you said? A. Yes.

Q. I take it from that you mean that if you had had more of it, you were more likely to be concerned about a fire danger? A. Well, at the time, I was not concerned about fire at all.

10 Q. Under your own wharf? A. Under our own wharf.

Q. You have revealed your knowledge of welding operations. Did you know, prior to 1951, that welding operations could ignite fuel oil on land? A. Not to my certain knowledge, no.

20 Q. Your phrase was "certain knowledge". I take it you would have assumed, from your earlier evidence that if welding sparks came in contact with a combustible material which was lying in the oil or around the oil, that that could well have started a fire - and I am speaking about the shore? A. Yes, but I do not agree with the inclusion of fuel oil in that statement.

Q. Do you mean to say that you had no knowledge of whether fuel oil would burn? A. From sparks from an electric torch, or an oxy torch, I would not know.

30 Q. You have agreed with me that you then knew if ignited it was certainly inflammable, once ignited? A. Yes, given correct temperature and everything else.

Q. Therefore if you started a small fire at or near it, it would be within your knowledge then that it would be likely to burn - if you started a fire? A. If you started a fire.

Q. I am putting to you only this, that you said that you would have assumed that welding sparks could have ignited some combustible material. I am only on the shore. A. Yes.

40 Q. I take it, therefore, you would have certainly assumed that if you had some combustible material at or in your fuel oil lying on shore, banked up or spilt, or in tins, or lying in quantity on wharves or anything, and if you allowed that combustible material to come in contact with the oil it follows, does not it, it could well have started the burning of the oil - if all those things happened? A. If they all happened it could.

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 27.

T. Durack
20th February,
1963.

Cross-
Examination
continued.

Q. That being the position on the shore, you just did not apply your mind, did you, to the question of oil on water, at the time? A. Yes.

HIS HONOR: At which time?

MR. ASH: Q. At the time you heard of this spillage? A. Surely the properties of the water underneath made it difficult to ignite the oil on the water?

Q. Did you address your mind to the oil not on the water, that is to say on the piles, fore-shores and slipways? A. No. 10

Q. That oil in the slipway, at low tide, is in precisely the same position as oil on the shore? A. Yes.

Q. And oil on piles is also in the precise position? A. I agree.

Q. You say that you knew this welding was going on at the sheerlegs wharf? A. I had been told, yes.

Q. That being so, did you inquire from anyone as to where welding was going on on the wharf? A. I was told by the manager of Morts Dock where it was. 20

Q. Did you go and watch it? A. No.

Q. Or the oxy cutting? A. No.

Q. Did you think that was worth while? A. I did not.

Q. Did you go and inspect, on the wharf, the possibility of this molten metal falling on the wharf? A. No. 30

Q. Or through the wharf? A. No.

Q. Or on to debris? A. No.

Q. Or on to any inflammable material? A. No.

Q. You did not go searching for those matters on sheerlegs wharf, that day, or any of them? A. No.

Q. Or ask any questions about those operations? A. No.

Q. You say, however, that you spoke to this Mr. Bransgrove? A. Yes. 40

Q. You were asked this:

"Q. Did you discuss this spillage with Mr.

Bransgrove? A. Not from the point of view of spillage.

Q. From the point of view of fire risk?

A. From the point of view of fire risk."

Why did you ask him that? A. I wanted to clarify my own thinking.

Q. What thinking did you want to clarify? A. I wanted to see if anybody had any different opinions to me. My opinion was that there was no damage, and the two other people I consulted agreed with my opinion.

Q. So it is quite clear that it was present to your mind, when you spoke to Mr. Bransgrove, that someone else might be of another opinion on this fire risk? A. Yes.

Q. And I have no doubt that one of the features that operated in your mind was that you had a very limited experience of fuel oil? A. That is right.

Q. At all events, you did think it was worth raising again? A. Yes.

Q. When you were speaking to Mr. Bransgrove, did you tell him that they were welding on the wharf? A. At that time I did not know they were welding.

Q. This is the time you went to ask him if there was any fire risk in his opinion? A. Yes.

Q. You did not tell him they were welding on the wharf? A. I did not know, at that time, no.

Q. You only saw him once on this matter, before the fire, did not you? A. We were in contact. He is at the same place as I am.

Q. I appreciate that you see each other, but you only had the one specific conversation with him, on this question of fire risk? A. Yes.

Q. Before the fire? A. Yes.

Q. And you did not mention welding on the wharf? A. I do not think so.

Q. Or oxy cutting? A. I do not think so. I cannot recollect the whole conversation. It is 11 years ago.

Q. You did not suggest that he come around to the sheerlegs wharf and have a look at things? A. No.

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

20th February,
 1963.

Cross-
 Examination
 continued.

Q. Of course, the duties of Mr. Bransgrove were really, as you said, I think, to test the petroleum products that you received there?

A. Yes.

Q. That was his main task? A. Testing of all petroleum products.

Q. Well, they would be petroleum products received by you? A. Not necessarily. They take them from everywhere - competitive samples, at times, and overseas samples and ships' bunkers. The ships may put in samples for analysis, because they think the gravity is too high. And they do research work.

10

Q. Their main object is to test the quality of oil either being bought or sold by your organisation? A. That would be one of their main functions.

Q. And Mr. Bransgrove was working, you say, in that laboratory, for a number of years?

A. Yes.

20

Q. Did you know whether or not he had conducted tests as to the ignitability of fuel oil on water?

A. No.

Q. You did not ask him? A. No.

Q. Did you ask him what his qualifications were, in the sense that he was a chemist or a fuel man or what? A. No.

Q. What precisely is he, or was he then, in office? He was, I think, second in charge of the laboratory.

30

Q. Where was the man in charge? A. He was there.

Q. You did not speak to him about this matter? A. No.

Q. You just took Mr. Bransgrove's view? A. That is right.

Q. Apart from him being in the laboratory and being second in command, you did not know anything about his qualifications? A. No. I accepted him as being a chemist and being in charge -

40

Q. And you did not take him around to see Mr. Parkin? A. No.

Q. And you did not take him around to show him how the oil was lying on the water in Mort

Bay? A. No.

Q. And then you spoke to Mr. McAnalley? A. No, before.

Q. I should have said another person you spoke to was Mr. McAnalley? A. Yes.

Q. He, of course, gave evidence in the previous case? A. Yes.

Q. The Morts Dock case, and you were not called as a witness in that? A. No.

10 Q. And he was your foreman? A. That is correct.

Q. Apart from the fact that he had been employed there a long time, you did not know what qualifications he had, apart from the fact that he was an efficient foreman? A. Well, he and I started there together. We worked together there for a number of years, in Sydney, and I have also worked with him in Melbourne and Newcastle, so I know he was a practical man. By "qualifications", I just do not know exactly what you mean.

20 Q. Well, I mean the precise amount of technical or tertiary training he had had in this field of oils. You do not know that? A. No.

Q. You realised, of course, that there was a very substantial spillage of oil? A. Yes.

Q. As regards your own experience you had been there at this place, ten days, at that stage? A. Yes.

Q. Or about ten days, give or take a day? A. Yes.

30 Q. And you yourself had had no experience you say with bunker oil? A. No.

Q. Although it was tied up at your wharf, they were not doing business with you for bunker oil? A. No.

Q. They were getting it from the vacuum people? A. That is correct.

HIS HONOR: Q. You did not have any at that place? A. There was none at Ballast Point.

40 MR. ASH: Q. I am not suggesting they rejected you, but they were getting the bunker oil from Vacuum. Did you ring up Vacuum? A. In what connection?

Q. In connection with finding out what was the nature of the oil they were supplying? A. No.

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

Q. So you, although you were aware of flash-points, made no inquiries from Vacuum as to the precise nature of this oil? A. It was not my business.

Q. Well, you did not do it? A. No.

Q. As far as you were concerned, you did not know what its flash point was or what its components were? A. That is true.

Q. You spoke to Capt. Simpson on the 'phone?
A. Yes.

10

Q. He was the Acting Harbour Master, I think?
A. That is correct.

Q. You did not ring him at all, at first - he rang you? A. That is right.

Q. And I think you said he told you of a number of complaints? A. Yes.

Q. And that he told the complainants all claims would be referred to you? A. That is so.

Q. And there were, in fact, a large number of claims made against you, or lodged with you? A. That is correct.

20

Q. And they extended from people right around Mort Bay and a lot of Snails Bay, did not they?
A. I cannot recall Snails Bay. I know Mort Bay.

Q. Do you remember a Mr. McCotter? A. I think I remember that name.

Q. As being one of those you think made a claim against you in respect of this? A. I only handled the initial claims. Everything after that was transferred over to Lloyd's surveyor.

30

Q. You would agree with me that you had a large number of claims from foreshore residents, or foreshore industries or launch owners?
A. Mainly launches.

Q. You would agree with me, from your knowledge of them, they were claims that were well based?
A. Yes. (Objected to).

Q. As regards the conversation, it was Capt. Simpson who asked you to go to see him. He told you, during that interview, of a number of measures that could be adopted to break up this oil? A. He discussed some measures, yes.

40

Q. He told you about the boom and the sand. Did he tell you about foam extinguishers? A. No.

Q. And did he tell you about artificial emulsifiers? A. No.

Q. You went to see Capt. Simpson, as I think you said, on methods of breaking it up, did you?
A. No, not particularly. I went to see him at his request, in answer to these complaints he had received from boat owners.

10 Q. In short, at that stage, you were in the position of the person taking charge of the doing of something, or not doing something about this oil about Mort Bay; you were the central point of it? A. I was one of them.

Q. You were the man who had been over to Morts Dock to see Mr. Parkin? A. Yes.

Q. And who had gone to see the Maritime Services Board? A. Yes.

Q. And in fact, you would agree with me that nothing was done by the Caltex Company to disperse the oil? A. That is so.

20 Q. They did not take any active measures at all between the spillage and the fire, in connection with alleviating the oil, did they? A. No.

Q. Then of course, as you said, Capt. Craven came into the picture? A. That was very early.

Q. He was, in fact, the prosecuting officer for the Maritime Services Board? A. I do not think so.

HIS HONOR: Q. Do you know whether he was or not?
A. I do not know.

30 MR. ASH: Q. As you said, when Capt. Craven told the Master of the "Wagon Mound" that he would be responsible, the Master gave you an authority to act on his behalf in any prosecution? A. That is correct.

Q. And did you go down to the Police Court?
A. Yes.

Q. And you pleaded guilty, on behalf of the "Wagon Mound" Master to a prosecution under the Port Regulations? A. That is so.

40 MR. MEARES: If my friend wishes to establish the plea and the nature of the charge, I might be able to admit it. This witness probably will not remember it.

MR. ASH: Q. When you had these conversations on

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

deck, with one or more of these men from the Board or the Harbour Patrol, your main concern, of course, was to get the ship away on time?
A. That was part and parcel of my job.

Q. I am not complaining, but that was, in fact, your main concern? A. It was.

Q. Would you agree with me that the length of the ship, the "Wagon Mound" was about 520 feet?
A. That is correct.

Q. The Ballast Point wharf was 200-feet? A. That is correct. 10

Q. But you had some overhanging dolphins?
A. Dolphins situated at either end of the wharf.

Q. And if you added the combined length of them together you would get about another 120-feet?
A. I think more than that.

Q. Well, up to 150 - about that? A. Yes, that could be right.

Q. About right, anyway? A. Yes.

Q. You gave some evidence on the view you had from your office. Your office, of course, was then about 100-yards away from the wharf, was not it?
A. Which wharf? 20

Q. The Ballast Point wharf? A. No, it is further than that.

Q. It is further than 100 yards? A. Yes.

Q. You said you had been on the bridges of ships of comparable size to the "Wagon Mound" berthed at Ballast Point? A. Not necessarily berthed at Ballast Point. I have been on the bridges of similar ships to the "Wagon Mound" not necessarily at Ballast Point. 30

Q. You cannot recall ever being on the bridge of a 10,000 tonner, or roughly the size of the "Corrimal", at Ballast Point? A. Do you mean the "Wagon Mound"?

Q. Yes, about the size of the "Wagon Mound", at Ballast Point? A. No.

Q. You gave some evidence of what you were able to see from the bridge, so you cannot give that evidence. 40

HIS HONOR: He did give the evidence.

MR. ASH: P. question , appeared to me to

imply that, the wharf.

MR. HOLLAND: There may have been some confusion between myself and the witness, but I assumed he was talking about bridges of ships at Ballast Point and I asked the question for that purpose.

MR. ASH: I am not suggesting any impropriety. I only want to clear it up.

HIS HONOR: The evidence given was:

10 "Q. Have you been on the bridge of ships similar to the 'Wagon Mound'? A. Yes.

Q. Similar height? A. Yes.

Q. When they were at the Caltex wharf? A. Yes.

and then he goes on to say that, from the bridge of a ship comparable to the "Wagon Mound", tied up at the wharf, you can see a corner of the sheerlegs wharf, that being corner adjacent to the Yeend St. ferry wharf:

20 "Q. What distance down the wharf? A. Approximately 40 or 50 feet."

MR. ASH: Yes. I will leave it.

Q. Finally, you were on the ship, you say, for half an hour or so, the "Wagon Mound"? A. Backwards and forwards.

Q. But you did see the oil on the foredeck, as you said? A. Yes.

Q. Did you also see the men, at that stage, scooping it up in drums? A. Yes. The crew were scooping some up.

30 RE-EXAMINATION:

MR. HOLLAND: Q. You were asked some questions about the Standards Association of Australia Codes for Fuel Installations, 1950. To what extent do you work under instructions, in the management and carrying out of operations at the depot at Ballast Point? A. Well, we have numerous instructions. We have fire protection, fire precaution, the handling and discharge of tankers, cleaning of tanks, handling of ethyl fluids, warehousing.

40 Q. Are they comprehensive? A. Yes.

Q. Do they touch every kind of operation you conduct at the depot? A. Broadly.

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Cross-
Examination
continued.

Re-Examination

Defendants
Evidence

No. 27.

T. Durack

20th February,
 1963.

Re- ...
 Examination
 continued.

HIS HONOR: Q. Do you mean you get these in printed or typed form from the company and have them - ? A. From the company. These are compiled. Some are from overseas. We have instructions from London and New York. We have also instructions from our local head office, who would be the ones to interpret the S.A.A. code and incorporate it in instructions to terminals. We have terminals from Cairns, right around to Western Australia, and every terminal superintendent has a similar set of instructions.

10

MR. HOLLAND: Q. You tell my friend that you came in contact with fuel oil in 1951. He asked you whether you did not now have the opinion that fuel oil should not be brought into contact with welding operations on shore. When did you form that view? A. All my present opinions on the handling of fuel oils have all been subsequent to this occurrence and I think, frankly, I gained more knowledge during the Morts Dock trial than I had previously.

20

Q. You were asked whether you had addressed your mind to the danger of fire from the oil on the foreshores or on the piles, and you said you had not addressed your mind to that? A. That is correct.

Q. Could I put it to you now? Would it, do you think, in 1951, have made any difference to your view as to the risk of fire, if you had observed the oil on the piles or on the foreshores? A. No.

Q. When you inspected, with Mr. Parkin, the Morts Dock area, were there any welding operations going on at the time, that you saw? A. No.

30

Q. And if there had been any going on at the time, on the sheerlegs wharf, for example, would you have been in a position to notice them? A. Yes. No. I may or may not have been, because I could not see the whole of the sheerlegs wharf. I was only at one end of the wharf.

Q. Which end? A. I was at the western end, ~~because the main purpose of the visit was the fouling of the slipway.~~ (Objected to; latter part of answer struck out by direction).

40

Q. Did you know where Mr. Bransgrove lived? A. No.

Q. The depot at Ballast Point is actually out on a point, is it not? A. That is correct.

Q. A little peninsula? A. It is.

Q. What means of access are there to the company's property, from the land? (Objected to; allowed). A. Do you mean by means of public transport?

Q. Any kind of access. I imagine you can come to the wharf by boat. A. Yes.

Q. But how otherwise can you enter the premises? A. By road. Do mean lawfully or unlawfully?

10 Q. Lawfully? A. Through the main gate, in Ballast Point Road, which can be reached by either ferry from Erskine Street or by bus to Birchgrove, or by car, to the plant.

Q. And anybody who came by ferry would come to the Yeend St. Wharf? A. That is correct.

Q. Do you know how long Mr. Bransgrove had been working at the Caltex Depot at Ballast Point? A. Think about 1931 or 1932.

20 Q. At Ballast Point? A. At Ballast Point. He was one of the original laboratory staff at Ballast Point.

30 Q. Coming to the company's premises by any of the means of access you have described, would it be possible to be unaware of the existence of Morts Dock and the kind of work that was carried on there? (Objected to; allowed). A. I would say anyone coming on the ferry would be reasonably familiar with what was going on and they would know there were repairs going on, but whether they could see anything in actual details, I do not know.

Q. How about coming by road? A. By road, it would be very difficult to see anything.

Q. Did Mr. Bransgrove use and have access to the mess room you were talking about? A. No. They are more or less self-contained in their own laboratory.

40 Q. You were asked whether, to your knowledge, Mr. Bransgrove had done any tests of the ignitability of this fuel oil on water. Were any tests carried out by you or him, after the fire? A. Tests were carried out after the fire, but they were not conducted by myself, and I am reasonably certain by Mr. Bransgrove. I am reasonably certain they were not.

Q. Did you observe them? A. Not the actual

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Re-Examination
continued.

Defendants
Evidence

No. 27.

T. Durack

20th February,
1963.

Re-Examination
continued.

tests. But I did see one of them, part and parcel of it. I was not directly implicated or handling the tests, but I was interested enough to be looking at it -

Q. Where was it done? A. Outside the boiler-house.

Q. At Ballast Point? A. Yes.

Q. Tell His Honor what the test was that you actually saw. (Objected to).

Q. Do you know one way or the other, whether in these tests, the oil was on water or not?
A. It was on water, yes.

10

(Argument ensued on last objection; leave granted).

Q. What did you observe about this test? A. The only one that I saw, they were dropping slag into this water. It was carried out in a 44-gallon drum cut in half, and there was placed in that salt water, a coating of fuel oil on top of it, and hot slag was dropped in on top of that, to see whether it would ignite.

20

Q. Did you witness the dropping of hot slag into it? A. Yes.

Q. What happened? A. Nothing. It just went out.

HIS HONOR: Q. It was dropped from about what height? Do you know? A. Possibly two or three feet.

Q. Did you see what the slag did? Were you close enough to observe? A. It just hissed and went out. It went straight through the oil into the water, but did not leave any trace of it.

30

HIS HONOR: That is what one would expect, I think, according to all the evidence in the case.

MR. HOLLAND: Q. I was concerned also to know if you know whether Mr. Bransgrove took part in those tests? A. I do not think so. I think they were carried out by our head office engineering department.

40

Q. You were asked about claims that had been made by people in the vicinity, concerning launches and so on. What were the claims about, generally? A. Fouling the paintwork.

(Witness retired).

(Short adjournment).

No. 28.
EVIDENCE OF D. CRAVEN

Defendants
Evidence

DAVID CRAVEN Sworn, examined as under:

No. 28.

MR. MEARES: Q. I think your full name is David Craven? A. That is right.

D. Craven

Q. Where do you live? A. 17 Bingara St., West Pymble.

20th February,
1963.

Q. I think you are now retired. A. Retired from the Public Service. I am a Master Mariner.

Examination

10 Q. You were formerly employed with the Maritime Services Board of New South Wales? A. That is right.

Q. What was your experience with the Board? A. 25 years' service with the Board, 17 years as harbour inspector, 1945 to 1962.

Q. And your duties prior to being Harbour Inspector, were what? A. In the Pilot Service.

20 Q. Since you left the Board, as a Master Mariner have you been interested and concerned in pilotage? A. Yes, I have.

Q. As a Harbour Inspector, was it part of your duty to investigate spillages of inflammable and combustible liquids on the harbour? A. That is right.

Q. In the course of those duties as a Harbour Inspector, have you had experience of oil spillages in Sydney Harbour? A. Yes.

30 Q. And have you counted up the number of oil spillages of which you have records in the Department? A. There are numerous incidents, numerous.

Q. How many in all did you count up? A. In the vicinity of 40 something, 40 odd.

Q. 47? A. Yes. It could be more.

Q. HIS HONOR: Over what period does that extend? A. From 1950. The first one was 1950.

Q. From 1950 onwards? A. From 1950 onwards.

40 MR. MEARES: Q. What happened in relation to the first one? A. The first one concerned a ship berthed at Pulpit Point. There was a spillage of oil from that vessel in December 1950.

Q. Was it a minimal spillage or a great spillage? A. No, it was a major spillage - a

Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Examination
continued.

very considerable quantity of oil.

Q. What happened to the oil? Where did it go?

A. It extended over the whole of the Parramatta River and down the harbour, as far as reports go, to Watson's Bay.

Q. Was it fuel oil? A. It was fuel oil.

Q. In regard to that spillage, was anything done, in any way, to get rid of the oil? A. No, not that I know of.

Q. At that time, of course, in 1950, and during the time you were Harbour Master Inspector, until when you left those duties, the Maritime Services Board did have, I think, did it not, a fire float? A. They had a number of fire floats.

10

Q. Capable of, on the harbour, hosing sea water under pressure? A. Yes.

Q. In 1950, did they also have a supply of kapok for the purpose of making booms? A. I do not know about a supply of kapok. I know they had a boom. They had equipment. May I refer to a previous questions? I was asked was there anything done. I said no. As far as the Board was concerned, no, but there were operations carried out by contractors for many weeks, not by the Board, to clean up the mess, in baths and places such as that, the places affected by the oil.

20

Q. By that do you mean also troubles on slipways? A. Not by the Board. Steam cleaning and all that matter went on for weeks and weeks, but not by the Board.

30

Q. Do you know anything about any product now, that is of any use in dissipating oil on water? A. Yes. There are now a number of detergents available.

Q. Have those things been known to you since well after 1951? A. Well after, yes.

Q. And are they now used? A. They are now used, yes.

Q. There has been some talk about a product called carbon sand. Do you know of some experiments which were tried with that product? A. I have heard of it.

40

Q. When did you first hear of it; was it after the "Wagon Mound" fire? A. I first heard of it when it was proposed to import some for experimental purposes.

Q. From the Board's experience, can you tell me whether this has been used? A. No, it has not been used. It was imported by the Navy and the Board - I do not know about the Board, but the Navy did - for experimental purposes, but I do not know of it being used.

Q. So far as hosing any substantial quantities of oil is concerned, what has been your experience? A. The hosing of it would simply move it from one place to another.

Q. So far as booms are concerned, what length of boom equipment did the Board have? A. I understand it was 1,000 feet in 50-foot lengths.

Q. In October 1951, to be precise on 30th October 1951, did you have occasion to go over in a launch, towards Ballast Point for the purpose of investigating an oil spillage? A. I did.

Q. Did you have with you Mr. Litherland of the Board's Legal Branch? A. Yes.

Q. Tell His Honor what you observed concerning the extent of the spillage of oil on the water and if it was on the ship, on the ship, and if it was on the wharf, on the wharf. I am not suggesting anything to you. You just describe it to His Honor in your own words. A. Yes. Proceeding in the launch, we first observed the oil on the water in an area we know as The Needles, which is an area between Goat Island and Balmain.

HIS HONOR: I have the map showing Ballast Point and Goat Island, but it is not marked here as such.

WITNESS: We first observed the oil on the water, in that area, and it was there all the way to the ship which was berthed at Ballast Point. We observed it also as far as we could see over Mort Bay. The ship was berthed head south. We went around the bow of the ship to get on to the wharf. I boarded the tanker with Mr. Litherland and we observed the oil on the fore-deck of the tanker. We observed it also down both sides of the tanker, both sides of the hull, and we saw members of the crew employed in scooping up the oil with shovels and with the hands, into drums on the deck. From our position, I could see the oil as far as Yeend St.

Defendants
Evidence

No. 28.

D. Craven.

20th February,
1963.

Examination
continued.

Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Examination
continued.

HIS HONOR: Q. What time of day was this?

A. Approximately 10.30.

MR. MEARES. Q. Could you tell me whether, from your observations when you went there, the oil was on the port side of the "Wagon Mound" as well as the starboard side, in towards the shore? A. Both sides.

Q. In regard to any of the oil you saw what was its colour? A. It was black in colour.

Q. And did you identify it as furnace oil? A. I recognised it, from my knowledge, as being furnace oil. 10

Q. In relation to its spread towards Yeend St., is the picture that the tendency of it was to spread more or less along the shore line, or did it spread very widely out into the harbour? A. I already indicated we saw it first in that area between Goat Island and Balmain. It was there then.

Q. And you could see it as far as Yeend St.? A. As far as Yeend St. 20

HIS HONOR: Q. But in a wide spread, going a long way out from that shore? A. Yes, over the whole of the Bay. But a lot of the Bay I could not see. I have no doubt it could have been there too.

MR. MEARES: Q. Did it give you the impression of being quite wide? A. Over the whole of the bay.

Q. You, of course, I take it, at this stage, had a very substantial knowledge of the harbour? A. Of the harbour, yes. 30

Q. And you were aware of Mort Bay and the activities normally conducted there? A. Yes.

Q. You were aware, I take it, of the existence of the sheerlegs wharf and the dry dock and the various wharves in Mort Bay? A. Yes.

Q. And of the shipping industry being carried on by the Adelaide Steamship Co. on the side of the bay opposite the sheerlegs wharf? A. Yes. 40

Q. If you cannot recall it you will tell us, but can you recall as to whether you recollect on that day or immediately before it or the following day, observing the "Corrimal" alongside the sheerlegs wharf? A. I knew the ship was there.

Q. You were aware that repairs were being done to it? A. No. I did not see repairs. I do not doubt they were, but I did not see them.

Defendants
Evidence

No. 28.

Q. Did you consider in any way, at that time, the presence of this oil was a possible fire risk? A. I did not regard it as such.

D. Craven

Q. I think you had a conversation with Mr. Durack, whom you knew, did you not? A. I did.

20th February,
1963.

10 Q. And also with certain representatives of the "Wagon Mound", namely the captain and others?

Examination
continued.

A. The Master of the ship.

Q. Concerning (if I may cut this short) the question of the ship leaving? A. Yes.

Q. And whether or not there would be anybody that would appear for the Master, were he to be prosecuted? A. Again?

20 Q. Concerning whether or not the ship would leave and whether or not there would be anybody who would appear for the captain, to represent him, were he prosecuted? A. Well, the pilot was on board ready to take the ship away.

Q. But would that be correct? Did you have a conversation concerning the leaving of the ship? A. Yes, with the Master.

Q. And you were told that Caltex were the agents for the vessel? A. Yes.

30 Q. Was Capt. Olsen informed that the ship could leave so long as there was somebody remaining in Sydney to represent him in any proceedings? A. Yes, he undertook to leave an authority for someone to act on his behalf.

Q. And that was duly done, was it not? A. That was duly done.

Q. Following upon that, I think you reported the spillage to the Harbour Master? A. To the Harbour Master.

HIS HONOR: Q. The Acting Harbour Master? A. The Acting Harbour Master.

MR. MEARES: Q. Capt. Simpson? A. Capt. Simpson.

40 Q. And its nature? A. And its nature.

Q. First of all, you have said you did not think it was a possible fire risk. Did you know of anything at that time, which could have been done effectually to get rid or to do any good, in

Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Examination
continued.

relation to dispersing this oil? A. No, nothing at all.

Q. And may I take it that, looking at it as a pollution danger, if you had had any ideas as to something useful which could have been done apart from the pollution of slipways, you would have suggested it? A. I would, undoubtedly.

Q. Would it be correct to say that, up until 1951, it was a usual practice, if oil was put on the Harbour, to dissipate it by means of fire hoses? A. No. That was not the usual practice at all. 10

Q. Had you ever seen it done? A. If you refer to this type of oil. With spirit, that would be so.

Q. You did not think it would be practicable with this oil? A. I did not think so.

Q. Had you ever known, in your experience with the Maritime Services Board up till 1951, of any attempt to disperse fuel oil by means of hoses? A. No. 20

Q. Did you know, up till 1951, of any possibility of in some way dealing with fuel oil, by means of throwing ashes on it? A. No. I had not heard of it at that stage.

Q. Your position, I take it, as the Harbour Inspector was that you were under the Harbour Master? A. That is correct.

Q. And the fire floats which you have described, containing hosing apparatus and crews, were under your responsibility? A. No, they are under the responsibility of the Superintendent of Floating Plant. 30

Q. But supposing you wanted to use them, you would ring Capt. Lockett? A. No. I would ring my chief, the Harbour Master. I am merely an inspector, and I would report to my chief. He gives the orders.

Q. Did you ever, at any time, suggest to your chief, the acting Harbour Master, that it would be practical to do anything in regard to this spillage? A. No. 40

Q. Had you ever seen or heard, at that time, of any fire caused through the spillage of fuel oil on water? A. No. I had not.

Q. And did you imagine it could happen? A. Not

at that time, I did not.

Q. May I suggest to you that since the Morts Dock occurrence, on 1st November, you have had reason to change your opinion? A. I have heard - I have heard - that circumstances can be present. I have only heard.

10 HIS HONOR: Q. Did you know at the time it happened or between then and 1951, of some occurrence on the water between Cockatoo Island and Spectacle Island, a fire there or anything of the sort? A. No. I had not heard that.

20 MR. MEARES: Q. You might tell me what the practice was in relation to dispersing fuel oil, in 1962, just before you left. A. Subsequent to this incident the Board had called upon the oil companies to provide themselves with equipment, which they have done, and that is associated with the development of the use of detergents in recent years, and also associated with the amend-
ment of the regulations which are now under the control of Navigable Waters Regulations, to provide a major penalty.

Q. When you say "major", I think this is in the vicinity of a maximum of £1,000? A. £1,000 is the maximum.

30 Q. I want to ask you as to the methods available for doing something in relation to fuel oil on the harbour? A. The oil companies have provided themselves with equipment, with the object of compounding it was required by the regulations, and rendering it harmless, and they have the means now, by means of detergents, of doing something with it.

Q. This is a positive duty placed on the oil companies, not only giving them the right to do it but charging them with the duty of doing it? A. Obligatory, provided for in the regulations.

40 Q. May I take it that you were aware, at the time of the fire, that fuel oil was beneath 150° flash point, was not beneath 150° flash-point? A. That is right.

Q. Were you aware, generally speaking, of its flashpoint properties? A. Yes, I was aware of it.

CROSS-EXAMINATION

MR. ASH: Q. I think you have expressed the view

Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Examination
continued.

Cross-
Examination

Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Cross-
Examination
continued.

that the oil floating around the Harbour from near Ballast Point, and down to Yeend Street, in your view, that morning was not a fire danger?
A. That is right.

Q. I think you also have the view that it is a different position when you know that oil is under the Sheerlegs Wharf, with floating debris and cotton-waste around it, and welding, with sparks flying, going on above? A. I did not see that.

10

Q. No, but that would, you will agree, create a very different situation? A. It could do. I have no personal experience of it.

Q. No, but your general knowledge tells you that? A. Yes, that is right.

Q. Here we are in 1963. That general knowledge would have still told you that in 1951? A. Not necessarily; it did not occur to me.

Q. You say it is your view now. In giving this view, the oil spread over the water was not a fire danger, you were just thinking of the oil where you saw it? A. That is right.

20

Q. And you did not follow up in your mind the possibility of this oil floating under the Sheerlegs Wharf and coming into contact with a lot of combustible floating debris, and that situation continuing under the wharf, with welding and oxy burning going on? A. No, I did not - (Objected to; allowed).

Q. You agree, too, of course, that furnace oil - you would know it could become a fire danger in certain circumstances? A. I agree with that.

30

Q. And the circumstances would include places where it could come alight? A. That is right.

Q. You were an inspector at that stage, and you had branches of the organisation concerned with fire and its prevention on the harbour?
A. That is right.

Q. I am not suggesting that you should have taken any action yourself in this regard. Had you, however, directed your mind to the fact that that oil might flow in quantity under an area of a wharf, soak debris, and possible be ignited by molten metal from the operations, had you directed your mind to those facts, I take it that it is commonsense you would have had a very different opinion that morning? A. Yes.

40

Q. And the fact was that you had no occasion to direct your mind to those matters? A. No.

Q. To put it quite bluntly, while you were holding this office at the Board, fires were not within your field? A. No, I had nothing to do with fires.

Q. And having nothing to do with them, at that time you were not concerned with even thinking of them; you were an investigation officer reporting to Captain Simpson? A. An inspection - inspect and report - and I would report to my chief who would take the appropriate action if necessary.

Q. His Honor asked you about a fire between Cockatoo Dock and Spectacle Island. Do you remember His Honor asking you something about that? A. Yes.

Q. Were you with the Board during the war years? A. Yes, at Newcastle. I was stationed away from Sydney.

Q. You knew of Captain Murchison? A. Yes, Captain Murchison was the Harbour Master.

HIS HONOR: Q. When did you come to Sydney? A. In 1944.

Q. What part of 1944, can you remember? A. December, 1944.

Q. The end of 1944? A. 30th December - the end of December, 1944.

MR. ASH: Q. Did you read a pronouncement of Captain Murchison in December 1943 published in the Sydney Morning Herald about the extent of the fire danger in allowing oil to escape on the harbour? A. No, I never heard of it.

Q. And I suppose you will agree that those matters of fire danger on the harbour were being dealt with by headquarters? A. Captain Lockett and others.

Q. Is Captain Lockett - where is he? A. He is now retired, but he is living in Sydney.

Q. I think you have the opinion, if you get the situation where furnace oil accumulates on the shore, or soaks piles quite noticeably under a wharf with the rise and fall of the tide, that would retain the furnace oil apart from the water obviously wouldn't it? A. Yes.

Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Cross-
Examination
continued.

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Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Cross-
Examination
continued.

Q. And again that morning when you inspected this situation on the harbour and formed this opinion that you have said was a fire danger, you had not directed your mind to the question of the oil on the piers under the Sheerlegs and the oil over the foreshores? A. I did not.

Q. You expressed that opinion of no fire danger just on what you saw of that oil on the water from Ballast Point up to the Needles?
A. Yes.

10

Q. It was based on what you saw of that?
A. That is right.

Q. Going back to 1951, you said earlier that the clean-up at Pulpit Point was not undertaken by the Board? A. That is right.

Q. It was undertaken by the Vacuum Oil Company, by sub-contractors? A. Yes.

Q. And the Vacuum Oil Company were the people at the installation of Pulpit Point where the spillage came from? A. Yes, that is right.

20

Q. And you say there was no regulation in those days forcing the oil people to take their own measures; that only came in later? A. It was only a penalty provided for the offence itself. It was embodied in the Port of Sydney Regulations at that time.

Q. Yes, I appreciate that; but there was no regulation at that time forcing the oil companies to take any action? A. Just a penalty for the offence.

30

HIS HONOR: Q. For the spilling? A. For the spillage.

MR. ASH: Q. Although the penalty was there, I take it from what you said, there were no special regulations making them do something about breaking up the spillage? A. It is obligatory in the new regulations to confine it in as short an area as possible, and make it harmless.

Q. And that was not in force in 1950? A. No.

40

Q. But notwithstanding, the Vacuum Oil Company did set about it under sub-contractors? A. Yes.

HIS HONOR: Q. Did you see anything yourself of what those sub-contractors did? A. Yes, steam cleaning, particularly at Watson's Bay Baths in particular, and some cleaning operations were

going on at a number of places.

Q. On the shore? A. Yes.

Q. Did you see them doing anything in the water itself? A. No, not in the water itself; not for some considerable time after the cleaning. It was a considerable nuisance.

Q. Using scoops, or anything of that sort?

A. No. I cannot recall the particular implements, but I know steam cleaning was amongst the methods employed.

10

MR. ASH: Q. Perhaps it is outside your knowledge, being in this other branch of the Board; but you know that the Board, after you came there, did have these booms and things? -

HIS HONOR: You had better make it more specific than "booms and things". Take booms to start with.

MR. ASH: Q. Booms for a start; do you know whether the Harbour Authority had the booms to contain oil? A. Yes, it had a boom; it was in 50-foot lengths - not plural.

20

Q. What did Captain Lockett's squad have in those days? A. He had that at Goat Island; it was under his control. It was for a specific purpose.

HIS HONOR: Q. You say it is a boom, in the singular; but was it all one piece? A. In 50-foot lengths.

Q. And you put those together? A. It can be lashed together as required.

30

Q. I think you said it had a capacity of 1,000-feet? A. The maximum yes; it would extend 1,000-feet.

Q. Twenty of those 50-foot lengths? A. It was to be made into one.

Q. If you wanted to contain a comparatively small area, you would use some of them, and not use all? A. That is right.

MR. ASH: Q. Do you remember that they had a means of scooping it up? I mean the Board in those pre-1950 days. Do you remember they had a punt and a means of scooping it up? A. There is a plant, yes. It was under the Engineer-in-Chief. They have scows, and they do clean up rubbish and debris, yes they have wire scoops

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Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Cross-
Examination
continued.

in small scows. That goes on all the time -
port cleansing.

HIS HONOR: Q. Wire scoops? A. Yes, wire scoops.

MR. ASH: Q. What about scoops to get up oil?

A. I have not heard of those.

Q. If they were there, you did not know about
them? A. I had not heard of those.

Q. Did you know of ashes being used by the
Board? A. No, I have not heard that.

Q. And you were associated with the fire squad
in no way? A. In no way at all. 10

Q. As soon as the onus by the regulations was
put on the companies to do these sorts of things,
they got equipment pretty smartly? (Objected to).

Q. It appeared to you that they got equipment
pretty soon? - (objected to; allowed).

HIS HONOR: If he knows the answer, I will allow
it.

MR. ASH: Q. They got the equipment pretty soon? 20

A. I say no to that; it was not very soon. It
took some time before they all eventually did,
because considerable construction contracts had
to be let to make and construct them, and it
took some time before they were all eventually
provided with them.

Q. And they now cover a range of quite a few
things to deal with this situation? A. Yes.

Q. I will ask you something more about the
extent of the oil. You saw that morning, on
the Wagon Mound, will you agree, pretty thick
concentrations on the portside? A. Yes. 30

Q. And you said about being on both hulls; and
in fairness to you I think I should say I am
going through some of the comments you made when
you gave evidence earlier? A. Both sides of the
hull.

Q. Yes, both sides of the hull. Did you see
it going right up to the tops of the plating,
and it was near the scuppers? A. That is right.

Q. On both sides? A. On both sides. 40

Q. And you describe the oil on the water as a
considerable quantity over a wide area? A. That
is right.

Q. And it was a very thick and heavy concentration being trapped there by the ship? A. That is right.

Q. And going down to the Yeend Street Wharf there were very thick concentrations there? A. Yes.

Q. And when you were proceeding from the Quay, you went direct to the ship and were ploughing through the oil? A. That is right.

10 Q. And you ploughed through the oil, after you came to it, for some five minutes? A. Yes, some minutes. My recollection is of the possibility of slowing down through the oil to avoid throwing it on the launch, and that would account for some five minutes.

Q. And you went through it for some 200-yards before you reached the ship? A. More than that - 1500-feet when we first saw the oil.

20 Q. When you were on your launch going through it, about 1500-feet you travelled through it before you got there? A. Yes, that is right.

Q. Where did you come from again? A. Circular Quay.

Q. It was very thick between the ship and the shore, very thick concentrations because of the barrier the ship was making? A. That is right.

30 Q. And you said to-day that crewmen were scooping it up in the drums, and you agree it was spread over the deck, and it was very thick and deep there? A. That is right.

HIS HONOR: Q. You have said that between the Wagon Mound and the shore it was very thick; is that right? A. That is right.

Q. How did you know what its thickness was, whether it was very thick, or whether it was thin, or what? A. Merely by appearance; I did not measure it.

40 MR. ASH: Q. I asked you a question earlier about your knowledge of fires previously. (Showing press cutting book to witness). This is December, 1943. Does not this bring anything back to you, because you were with the Board, about the oil fire on the harbour, and Captain Murchison saying "and the extent of the blaze is an urgent warning of the great danger of allowing oil to escape into the harbour." Does not that revive your memory, perhaps, of the knowledge of this incident? A. No, I do not remember that at all;

Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Cross-
Examination
continued.

Re-Examination

I had not heard of it.

Q. Were you at Newcastle all the time until 1945? A. Six years.

Q. I suppose it would not come within your province to discuss these matters with other members of the Board; you are only concerned with inspecting and reporting? A. That is right.

RE-EXAMINATION

MR. MEARES: Q. You mentioned some method of catching debris that the Board had in 1951, and you have told us that you knew Morts Bay, of course. As far as debris in Morts Bay was concerned, can you tell us what the position was in regard to Morts Bay, so far as debris was concerned; was it abnormal, neutral, or what? A. As the result of that activity, you mean? (Objected to; allowed).

10

Q. No; if I asked you about Morts Bay - I said "What is it like in regard to debris? or "What was it like in 1951 in regard to debris?" can you tell us what the position was? I am not suggesting there was any, or there was not any, or whether it was good or bad. A. I understand, as far as I know, nothing unusual.

20

Q. Would you tell me this insofar as debris is concerned in bays in the harbour. Do you get sometimes quite a bit of it, and at other times with other conditions, the bays are fairly free of it? A. I think so. There are others more qualified to say that, because I know there is plant available, and they have been scooping up garbage and refuse; but I do not know the extent of their activity.

30

Q. You were asked by Mr. Ash whether you had anything to do with fires? In the event of a fire occurring when you were carrying out your duties, the responsibility in relation to fires is not yours at all? A. Not mine at all.

Q. And the responsibility of acting and taking measures to do what can be done to put it out is the responsibility of whom? A. The Harbour Master - I beg your pardon; you said "putting it out"? He is the head of the branch.

40

Q. He directs operations? A. He directs or requests the officer who has charge of that plant.

Q. You said the boom in 1951 was used for a specific purpose; what was that purpose? A. Its intended purpose was to impound inflammable spirits.

Q. Such as what? A. Petrol - inflammable spirit.

Q. Do you mean by that of a flashpoint under 150? A. 150.

10 Q. As far as oil was concerned, when you went along there on the morning of 30th October, you observed that it had moved right around to Yeend Street? (Objected to; pressed; allowed).

Q. You observed that it had spread around to Yeend Street? A. As far as Yeend Street - as far as I could see in that direction.

20 Q. And from your knowledge of fuel oil, did you at that time have any views as to whether this spread would move, vary from time to time with the winds and tides? A. I believe it would.

Q. Did you appreciate or not that with this substantial concentration and amount of spillage that you saw that it would go against the piles? - (Objected to; allowed).

Q. That in its movement around any shoreline it would go against piles? A. Yes.

30 Q. His Honor asked you a question as to how you could tell whether the oil was very thick, and may I, with His Honor's permission, put another question? Namely: How you could tell it was very thin? A. Merely by appearance. Merely by appearance.

Q. When it was very thin what would it look like? A. A film; it would have the appearance of an oil film, and when it is very thick, it would be jet black.

Q. So it was the colour that assisted you in reaching a conclusion whether it was thick or thin? A. To some extent.

40 Q. When you say it was very thin and it was a film, do you mean by that where it was very thin, sometimes you would be able to see the water, or there would be streaks of it? A. No, the impression to me was - you form an assessment of it being thick or dispersed by merely the appearance of it, and by the way it registers

Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Re-Examination
continued.

Defendants
Evidence

No. 28.

D. Craven

20th February,
1963.

Re-Examination
continued.

with one; no measurement at all.

Q. And the colour is the main factor? A. Yes, it is of a lighter colour when it is more widely dispersed - apparently of a lighter colour.

MR. ASH: (By permission). Q. Mr. Meares has asked you certain questions. But the position is, when you went over there that morning, you only saw it up to Yeend Street and out to the Needles, and any views you express on it are based on what you saw there? A. What I saw.

10

Q. In regard to the thickness my friend asked you about, would you agree that your impression was of the thickness of the furnace oil on the deck of the Wagon Mound was something in the order of six-inches; that was your impression at the time? A. At the time; I know now that is erroneous.

Q. Because, I think, Mr. Meares drew your attention to the gunwhale being only three-and-a half inches high? A. They are referred to as "rising plates". I know what it really is now.

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Q. Because he told you the gunwhale is only three-and-a-half inches? A. Three-and-a-half inches on that type of tanker.

(Witness retired).

No. 29.

R.F.Tuddenham

20th February,
1963.

Examination

NO. 29.

EVIDENCE OF R.F. TUDDENHAM

RONALD FREDERICK TUDDENHAM Sworn, examined, deposed:

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MR. MEARES: Q. I think you are a Bachelor of Science of the University of New South Wales, but you graduated from that University with 1st Class Honours and the University Medal in 1958? A. That is correct.

Q. I think you are at present engaged in research relating to problems of surface chemistry? A. That is correct.

Q. And you are writing a thesis for you Ph.D. degree in one aspect of this science? A. That is true.

40

Q. You were awarded a student research

scholarship in 1960 and since then you have been associated with the Professor of Physical Chemistry in the University of Sydney in research relating to problems of surface chemistry? A. That is correct.

Q. I do not recall his name? A. Professor Alexander.

10 Q. Is Professor Alexander a world authority on surface chemistry? A. Quite definitely.

Q. Is surface chemistry a science which involves the study and consideration of the properties of liquids and solids, and the surfaces of them, and the inter-relation between more than one liquid or more than one solid in regard to surface effects? A. It would be quite a good definition of surface chemistry.

20 Q. I think some few weeks ago you were consulted in connection with this present case and you have collaborated substantially since then with Professor Hunter and Mr. Howard Parker? A. Yes, that is true.

Q. Have you discussed the problem, or rather, the question of surface effects on the harbour in relation to this Wagon Mound spillage? A. That is right.

30 Q. In addition to having discussed with Professor Hunter on a number of occasions, have you conducted a number of tests and given the matter your closest consideration? A. Yes, I have.

Q. And this problem is a problem, may I take it, which is peculiarly a problem of surface chemistry? A. That is true.

HIS HONOR: When you say "this problem" it could be taken to refer to the overall problems in relation to the case. Make it quite specific.

40 MR. MEARES: Q. When you refer to "this problem", do you mean the question of the extent to which the oil would have banked up, its thickness on the waters, and problems relating to whether or not in the course of time the oil for any reason might have lost some of its combustible qualities? A. That is true.

Q. For the purposes of your views, you assume, do you not, a spillage of oil at Ballast Point of a quantity of such magnitude that it was limited only by the fact that it was not

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
1963.

Examination
continued.

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
 1963.

Examination
 continued.

sufficiently great, in effect, completely to fill a container; and by "container", I mean the Sydney Harbour? A. Yes.

Q. In other words, a quantity which was not great enough completely to spread within a contained area? A. Exactly.

Q. You understand, I think, that the spillage took place at Ballast Point, of this substantial quantity, and that the fire occurred some 58 or 59 hours after the spillage, at or around the Sheerlegs Wharf, alongside which there was a ship undergoing repairs? A. That is true.

Q. And that in the relevant period of time the probabilities are that some welding or cutting operations were going on in and around the ship or wharf? A. Yes.

Q. I want you to discuss, if you would, the question of the thickness of the layer of this fuel oil if spilt on a harbour area such as where it was spilt, and I want you to assume it was of a flashpoint of 170-degrees, and that you have made certain tests of this particular oil and are aware, not only of its flashpoint, but of its viscosity? A. That is right.

Q. Will you go ahead? A. When a quantity of oil is spilt on the surface of the water it will spread out under the action of gravitational forces. If a large enough quantity is spilt, then the thickness of the film becomes independent of the amount spilled. The actual thickness is determined by the nature of two surfaces. In particular, in the case of water surface, it depends on whether or not there are any contaminating materials present on the surface.

Q. When you say "two surfaces" you mean the oil surface and the water surface? A. Yes. In the absence of a contaminating film, the oil will spread to an extremely thin film. In the presence of -

Q. Leave out contaminants and tell me what the film will be? A. My measurements of this particular oil indicated a film thickness of between one-twentieth and one-sixtyfourth of an inch provided there is free water surface on which the film can expand. In the presence of contaminants I found a thickening in the film of oil. I investigated several contaminants, all of which are likely to occur on the surface of the harbour water. The first of those I investi-

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gated is what is known as oleic acid. This particular substance was chosen because, firstly, it occurs naturally to a very large extent in animal fats and different oils. Secondly, of all the known compounds in existence which give rise to surface effects responsible for the thickening of films on water, this compound is acknowledged to have the highest effects. The two other contaminants which I investigated were engine oil and automotive grease.

Q. Did you select those as being compounds which would be in the highest range of contaminants or not? A. Yes, that is right. Engine oil and grease, I felt, would be quite likely to be found wherever there is industry in operation.

Q. Did you also consider the question in the harbour of the possibility of detergents and things of that nature? A. Yes. There is always the possibility of detergents in the harbour, but the effect of these would be considerably less than those, say, of oleic acid.

Q. Having considered possible contaminating properties in Sydney Harbour did you then conduct experiments for the purpose of ascertaining with what accuracy you could what would be the maximum thickening of the fuel oil described on harbour water so contaminated?

A. Yes. The maximum film thickness that I could obtain in the absence of wind, on a still water surface, was one-eighth of an inch; approximately one-eighth of an inch. This was observed in the case of oleic acid as the contaminating substance. This, providing again there is free water surface available and there is no change in the oil.

HIS HONOR: Q. When you speak of free water surface being available you simply mean, do you, that beyond the area of the oil-covered water there is still water? A. Yes.

Q. There is water? A. Yes.

MR. MEARES: Q. And as far as wind is concerned, if you can imagine an area of oil lenticular in shape, and the wind being directed up against it, and tending to force it towards the shore, do you think that that would have the effect, given the result of the wind being so driven or persuaded, of thickening the oil at all? A. I do, yes, definitely.

Q. Do you think this would be substantial or

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
1963.

Examination
continued.

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
 1963.

Examination
 continued.

minimal? A. I can only go by the results of my experiments in this case. I have found that under the circumstances where a maximum thickening due to a wind would be of the order of twenty per cent for a wind velocity of possibly 6.5 miles per hour. This is in the case where the wind is directed against the boundary which is tending to enclose the oil. In this case it would be directed straight into the bay in which the oil is present.

10

Q. And the only thickness you could get was an increase of approximately twenty per cent of the thickness of the oil before the wind was persuaded on to it? A. Yes.

Q. Did you additionally consider the problem of whether or not oil - and when I refer to oil I am speaking always of this oil or something like it - changing its character by virtue of any action existing in the area in the harbour where it was laying? - (Objected to unless it comes within the witness' specialty).

20

Q. Is this a matter within your specialty?
 A. Yes, definitely.

Q. Did you consider that? A. Yes, I did.

Q. Tell His Honor in your opinion what, if any, are relevant factors in considering the ability of oil so situated to change in its characteristics?

A. One distinct possibility where an oil of this nature is lying above the surface of sea water is that of emulsification. The oil itself has a density, or gravity if you like to call it that, very close to that of water. This factor, and also the fact that the oil itself is quite viscous, would tend to permit the formation of an emulsion under any mechanical action which could occur through the effect of waves breaking - the waves moving on the surface of the harbour water.

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Q. Please tell me if you do not think this is relevant at all; I am not suggesting it one way or the other. Is oxidation a relevant consideration or not? A. Very likely it is, yes.

40

Q. Which would you say would be the more important consideration of the two? A. Going on the results of my experiments of emulsification I would say this would be the most important factor.

Q. By that you mean emulsification? A. Yes.

Q. What is the end result of this change caused primarily by emulsification, and probably to some extent by oxidation; what is the end result? A. The end result is a very considerable increase in the heaviness of the oil, and by "heaviness" I mean its viscosity or resistance to flow. There will be an increase in the apparent thickness of the oil layer by the incorporation of a large quantity of water within the oil, and if the emulsion becomes thick enough, there is always the possibility of it actually becoming rigid and presenting an uneven surface to the action of waves, and so forth.

10

Q. And this substance, as emulsification proceeds - will it increase or decrease in its inflammable or combustible qualities? A. It must decrease owing to the incorporation of water within the emulsion.

20

Q. I want to show you a sample which consists of a jar, and inside it an object that looks dark on the top and is of some thickness. Do you see that object that I show you? A. Yes.

Q. Is that a result of the effect of emulsification, and to some probable extent, oxidation, on fuel oil of a flashpoint of 170-degrees? A. That is true.

30

Q. How long was it from the time you commenced the experiment until this result appearing in the beaker was achieved? A. It occurred within a period of approximately - within sixteen hours, anyway.

40

Q. You produce this example. I ask you was that the greatest or best example showing the extent of the emulsification that you achieved, or is it average, or less than average, or what, so that we might be quite clear about it? A. I think this would be fairly average. In the actual experiment that I did, some parts of the emulsion appeared up to half an inch deep, when viewing through the surface of the liquid.

Q. May I put it to you that the object I show you is very irregularly shaped, that it would seem that one portion of it is a little under a square inch, and that, leading from that portion a little under a square inch, there is another portion of less size which seems to be somewhat more regularly shaped than what I may term the main portion. Would you agree with that? A. Yes.

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
1963.

Examination
continued.

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
 1963.

Examination
 continued.

Q. And the piece that I show you would appear to have a varying thickness up to what, roughly?
 A. A quarter of an inch.

Q. Mr. Ash thinks it would be more, and for once I am inclined to agree with him. Would you have another look at it? A. Yes, I think you are right.

Q. Between a quarter and a half inch would you say? A. Yes.

(Luncheon adjournment).

10

AT 2.00 P.M.

MR. MEARES: Q. I want to revert back to one matter on which you expressed an opinion, of the possible thickening you could get on this surface oil as a result of a wind which you introduced. Were you able in the laboratory to practically introduce any higher wind than the wind you produced? A. No, I was not.

Q. Assuming it had been practicable for you to have introduced any higher wind, do you think it would have any marked effect on thickening the layer than the experiment you did at wind velocity of six and a half miles per hour? A. Not an appreciable amount. Actually when I increased the wind beyond six and a half miles an hour I found that the oil started to flow around and flow in the dish and there was no longer a damming effect.

20

Q. And it follows that you were able to produce a higher wind, but whenever you did it, the oil tended to run away, if I may use that expression? A. Yes.

30

Q. So far as the damming effect of wind was concerned, which had not been introduced on the oil on the water approaching the shore-line, would you consider that if it were thickened as the result of the wind by some twenty per cent, that it would tend to remain thickened if the wind abated, or would it retain its former equilibrium, or what would happen. A. It would revert back to its initial thickness.

40

Q. Without asking you to postulate a specific time, assuming you had a wind of eleven or ten miles an hour, to take a case, and then it dropped down to stillness, would the oil take a matter of minutes to regain its equilibrium or in a matter of hours or what? A. I could not

really answer that question definitely. In the laboratory experiments the reversion to the initial thickness was quite rapid - of the order of seconds.

Q. In relation to the beaker with water in it, and with a substance lying on the water, you produced that in the laboratory, I think? A. Yes.

Q. And it is the resultant of oil? A. That is correct.

10 Q. Bearing in mind always that I am speaking of oil of 170 flashpoint, and of the viscosity of that oil? A. Yes.

Q. Did you conduct an experiment for the purpose of demonstrating the effects of agitation of oil on surface water? A. Yes, I did.

Q. And you first of all did not cover the dish you were using completely with the oil; is that so? A. Yes, that is so.

20 Q. What portion was covered? A. Approximately one-third; initially that was. On agitation the film spread out to almost completely cover the surface of the trough. There were a few patches where the oil had not completely covered the surface.

Q. Was this done with harbour salt water? A. Yes, that is correct.

Q. Do you know where it came from? A. Yes, all the sea water came from Sydney Harbour at Manly.

30 Q. The beach side, or the bay side? A. No, the harbour side - the bay side.

Q. Then you would have put it in the dish, and what was the depth of your water? A. May I consult my notes?

HIS HONOR: Yes.

WITNESS: The glass trough in which the experiment was performed was three-and-a-half inches deep and was filled with sea water to a depth of approximately two-and-a-quarter inches.

40 MR. MEARES: Q. Having got this layer of oil which you have described did you then fix the dish so filled on to a form of tray, and did you then proceed to move the dish backwards and forwards in a horizontal plane? A. That is correct.

Defendants
Evidence

No. 29.

R.F. Tuddenham

20th February,
1963.

Examination
continued.

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
 1963.

Examination
 continued.

Q. What was the length of the movement? A. There was a three-inch travel of the dish in either direction - three inches this way and three inches back.

Q. And the time taken in the travel? A. For each travel, approximately one second, which makes two seconds for a complete vibration.

Q. Compare that with the movement of the surface of this substance in harbour waters, in your opinion was this movement that you subjected this dish to, greater in intensity and periodicity than you would expect in the harbour - or less? A. I should say it would be less.

10

Q. You subjected the dish to a test lasting for how long before you produced the result which includes Exhibit 3? A. This exhibit was taken from the water approximately 40-hours after the agitation had commenced. Actually the deposit in this emulsified material had started to form within one hour after shaking, and it could be seen that no free oil film was present on the surface after a period of approximately twelve hours.

20

Q. What was the picture then after one hour? A. The picture after one hour was that this heavy emulsified material had started to form in heavy beads, shall be say, at the end of the trough along the axis of vibration.

Q. Was the oil there, as far as you could observe, still present over the dish? A. That is right.

30

Q. Can you say at what stage of time you noticed any change in the oil in the dish and over the sides? A. No, I could not. The experiment was started at 4.00 p.m. and left to run overnight, and by the time I came in in the morning the material had completely emulsified.

HIS HONOR: Q. You started this off at 4.00 p.m. on the day before yesterday? A. Yes.

Q. When did you look at it the following morning? A. Approximately 8.00 a.m.

40

Q. That is sixteen hours? A. Yes.

Q. I thought you said after twelve hours it showed oil film? A. That should be sixteen hours.

MR. MEARES: Q. Look at this photograph; does that show a dish, and the condition of the substance on the surface and on the sides of the

dish at the same time? A. Yes.

Q. And does it also show the method in which the dish was tied down on to a horizontal surface for the purpose of rocking it? A. Yes.

Q. When was the oil in the condition you see it in that photograph? A. The oil had not changed to any appreciable extent from the time sixteen hours after the initial agitation from how it appears in that photograph.

10 Q. When was it that that photograph was taken?
A. A period of 24-hours after the initiation of the agitation.

(Photograph tendered and marked Exhibit 4).

20 Q. With your scientific knowledge, and aided by the experiment you did, could you give an opinion as to what, generally speaking, the condition one would have expected to see the oil in on the harbour 59-hours after it had been spilt, assuming that there was an average movement in the waters? (Objected to; allowed).
A. I should say that the oil would be substantially all in the emulsified form.

Q. In your opinion, would oil in what you describe as the emulsified form, either on the foreshores or on the waters, be combustible?

A. Definitely not. I performed a water analysis of this emulsified material and found that there was in excess of 75 per cent water contained in it.

30 Q. Did you endeavour to light it up? A. Yes, I did.

Q. By what means? A. By use of wicks of cotton waste previously soaked in the fuel oil.

Q. And you were not successful? A. No. The actual wicks were ignited with comparative ease by the simple application of a lighted match, but I was unsuccessful in causing flame by blowing down on to it to cause the emulsion to ignite.

40 Q. Did you put any hot substances in it? A. Yes.

Q. Or use any rods? A. Yes.

Q. What did you use? A. If I may consult my notes again - I placed two pieces of brass rod, one approximately three-sixteenths of an inch long by three-sixteenths of an inch diameter, and another three-eighths of an inch long and

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
1963.

Examination
continued.

Defendants
Evidence

No. 29.

R.F. Tuddenham

20th February,
 1963.

Examination
 continued.

three-sixteenths of an inch diameter on to the surface of the emulsified layer in the trough. I found that the lighter piece of brass required one minute fifty seconds to sink to the bottom; the heavier piece sank in one minute fifteen seconds. For comparison I filled the beaker with sea water to the same depth as in the trough and poured a half inch layer of the fuel oil on to the surface of the water and placed the same lengths of brass rod upon the surface; in less than one second the brass pieces were resting on the bottom of the beaker.

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Q. You may assume from the description of the fire which took place on the 1st November around the Sheerlegs Wharf that it would seem that it was undoubtedly persuaded and encouraged by a substance that was probably on the water, and not simply by the wood wharf catching alight because the evidence would suggest that people within a matter of minutes after seeing smoke underneath the wharf, and who were on the wharf, had to get off the wharf? A. Yes.

20

Q. And that the fire was seen up to the top of the mast of the ship, the Corrimal, and that it spread rapidly. The description of the oil under the Sheerlegs Wharf, or the substance under the Sheerlegs Wharf has been variously given. Some witnesses have stated that it appeared to be consistently black. I think another witness has described it as hanging from the piles in curtains. Another witness said that he observed some corrugations. Would the observation of corrugations of oil on the water, and of curtains, so described as hanging down the piles, suggest anything to you? A. Yes, it would suggest that the oil was in this emulsified condition.

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Q. Having done your experiments with water agitated as you think water normally would be on the harbour, can you explain why it was, assuming the fire to have taken place between the Corrimal lying alongside the wharf, and the shore, that the oil there had not reached this substantially emulsified non-combustible state? A. Yes, I would agree with that.

40

Q. Why do you think, assuming it was so, it was so? A. The only explanation I can give for this is that conditions underneath the wharf must have been such that the movement in the surface of the water required to emulsify the

material was not sufficient enough.

Q. And could you envisage that as being a possibility in the harbour underneath wharves?

A. It seems rather extreme to me. The waves actually formed on this trough were only of the order of one-inch high, and the surface underneath the wharf must have been in fact very exceptionally calm.

10 HIS HONOR: Q. Do you mean just where the fire occurred, or in all the water which was under the wharf? I don't know whether I make my question clear. Is this theory about the surface of the water being very calm simply a reasoning from the circumstance that a fire did occur?

A. Yes.

Q. And therefore the conclusion would be limited, I suppose, to the oil on the water at the precise site of the fire? A. I should say so, yes.

20 Q. It would not extend anywhere else? A. No.

Q. I thought a while ago you had said that what had been described as corrugations suggested that this emulsification had taken place? A. On the piles, yes.

Q. On the piles? -

MR. MEARES: The corrugations I put to him. The corrugations he refers to are the corrugations that one witness said he saw on the harbour.

30 HIS HONOR: I thought he described it as something he saw under the wharf.

MR. MEARES: I do not think so; my recollection is - and I could be wrong - that the witness who described that was Sharp, the industrial officer, when he was looking from the Joiners Wharf.

(Mr. Ash referred His Honor to the evidence appearing at page Mr. Meares referred to page , and succeeding questions and answers.

40 Mr. Ash referred His Honor to the on page and subsequent questions on page .

Q. It would seem he saw corrugations when he was standing round about Joiners Wharf and when he went to the Sheerlegs Wharf on the same day he saw corrugations underneath the wharf along the shoreline.

HIS HONOR: Maybe so, but one has to add this, I

Defendants
Evidence

No. 29.

R.F. Tuddenham

20th February,
1963.

Examination
continued.

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
1963.

Examination
continued.

think: That he saw oil stretching the full length of the wharf (P.) and it looked black and that you could see it was very thick.

MR. MEARES: Before that he noticed corrugations only on the foreshore.

HIS HONOR: Yes. If all that is accepted, one would suppose, if this witness is right, that this emulsification has not proceeded very far under the wharf.

MR. MEARES: By what time? 10

HIS HONOR: At any rate by the time this man was looking at it. This is all limited to the Tuesday.

MR. MEARES: Yes.

Q. I think you told us that the first signs of emulsification that you saw were against the end of the tray? A. Yes.

Q. Would you expect, with this process going on, that the first signs of emulsification would be observed if you were looking, would be emulsification, if it was a bay, up against the piles of the shoreline? You have already indicated that is primarily because the oil is directed up to an immovable object? A. That is right, yes. 20

Q. So there you will get the tendency for it firstly to emulsify? A. That is correct. It is due to the after-action that you get when a wave meets an object; the oil will be thrown up with the water, they will mix together in the process, fall down, and there will be a certain amount of emulsification occurring after each impact with the wall. 30

Q. As far as a description of curtains on a pile is concerned, would it in your opinion, and with your knowledge, be possible for what may be practically described as a curtain to be formed on a pile by oil of this viscosity as the result of the process of emulsification described by you? A. Could I have that question again? 40

Q. Would the existence of what has been described as a curtain of oil on a pile - oil of this viscosity - only be consistent with emulsification having taken place? A. Emulsification seems to be the best way of explaining it, I think.

Q. Could you explain it in any other way, with oil of this viscosity? A. No, I could not.

HIS HONOR: Q. Suppose you had oil on the water and as yet no significant emulsification had taken place, and as the tide receded some of that oil was left as a deposit on the pile; would it immediately run off again, back into the water, or would it stay there for some appreciable time? A. It would not stay there for some appreciable time, but you would be left with a thin film of the oil. The deposit of the emulsified material will look quite different from this film of oil, though. The emulsified material will be hanging in heads, with no further tendency, or little further tendency, as we found in our experiment, to fall. Whereas, the oil would run back to form a pretty thin layer around the pile.

MR. MEARES: Q. You mean the base of the pile at water level? A. Down to the level to which the water drops.

HIS HONOR: Q. On your view, by the time this fire happened, if a layer of oil was still extending well out from the foreshore at that time - that is, if the area covered by some oil was not confined close to the shore, but extended a considerable way out into the harbour - you would have expected all that to have been in this emulsified condition; is that right? A. Yes.

Q. And if for other reasons, if by reason of known facts you are forced to the conclusion that some of that oil was not in this emulsified condition, then you conclude that that particular oil had not been subjected to the movement of the waves, but had been in very calm water? A. That is exactly it.

Q. Does that mean that that particular oil had been in very calm water all the time throughout the whole lapse of the 50-hours? A. Yes.

CROSS-EXAMINATION

MR. ASH: Q. Arising out of what His Honor asked you: Assuming that at a point very near to this in another part of the bay the oil was all over a retaining wall, a slip and a launch, lying on the sand so that it came up through your toes, and that it remained in such a condition for a fortnight after it is first deposited there, that would tend against the fact of emulsifi-

Defendants
Evidence

No. 29.

R.F. Tuddenham

20th February,
1963.

Examination
continued.

Cross-
Examination

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
 1963.

Cross-
 Examination
 continued.

cation? A. No, exactly the opposite.

Q. Assume that the boats and launches - oil was continually coming up on them through that period; is that consistent with emulsification?

A. I do not quite see the point.

Q. Assume that the oil was in fact floating on the water, on the foreshore for a fortnight after its original deposit, lapping up against the boats, and oil being continuously on the boats, lying on the foreshore and squeezing through people's toes when they walked along it at low tide, is that indicative of emulsification?

10

A. Definitely, yes.

Q. The type of emulsification that you have conducted in the experiments, that you have revealed in the experiments? A. Yes.

Q. The type of emulsification that is exemplified by the exhibit tendered? A. Yes.

Q. You would agree with me that there is no liquid oil in that exhibit lying on the water?

20

A. Lying on the water, no.

Q. There is no liquid oil lapping up against the sides of the beaker, is there? A. No.

Q. There is what appears to be a semi-solid, if you can accept that lay word, mass in the water? A. Yes, that is right.

Q. Is this a fact, that you did this one experiment in this dish? A. Yes.

Q. You did only the one on this particular matter? A. No, there was one previous emulsification experiment, which was a trial experiment in which I made up an oil-water mixture of the same composition, and simply rocked it in a measuring cylinder.

30

Q. That was a trial run to inform yourself on the best way to conduct it? A. No, not really. We wanted to know whether emulsification could occur under vigorous conditions. If it could we would go further and see if it would occur under the conditions similar to those existing in the bay.

40

Q. And having established that it could occur under vigorous conditions, you then conducted this one further experiment and got that result? A. That is true.

Q. And your opinions here to-day are very

largely based on the results of that experiment?
A. That is true.

Q. You would agree with me, generally speaking, on that? You say you have done a special course and achieved some proficiency in this matter of surface tension? A. Yes.

Q. And notwithstanding that extreme scientific study and success at the end of it, you still thought it necessary, you found it helpful - even to you - to conduct this experiment to further your knowledge on this precise matter?
A. Yes.

Q. Would you agree with me that there is no relevant similarity between the experiment you conducted and the position of the oil and the waters in Morts Bay during those three relevant days? A. No, I would not agree with that.

Q. You made in this experiment a reference to oil coming up against an immovable object?
A. Yes.

Q. And you pictured that as lying in the foreshores of the bay and around the piles and wharf?
A. Yes.

Q. You appreciate in this experiment that is precisely what you did not employ? A. I would not altogether agree with that.

Q. You will partly agree with me? A. Insofar as I did not actually use piles, yes.

Q. Never mind the composition of any hard substance; do you agree with me? (Objected to).

Q. Do you understand me? A. Not very well.

Q. It is difficult speaking to scientist. Never mind the composition of any particular object. Take it as a stationary object of whatever substance and of reasonable hardness. I put it to you that you postulated the position of an immovable object and took that as the position of the bay, representing either foreshores, retaining walls or piles? A. Yes.

Q. I put it to you that there was no similarity? I put it to you that what you did in that regard, in your experiment, was precisely the opposite?
A. No. In fact, I believe there is a very strong similarity between them.

HIS HONOR: You mean when the experiment was being conducted the wall of the dish or the side of

Defendants
Evidence

No. 29.

R.F. Tuddenham

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
 1963.

Cross-
 Examination
 continued.

the dish was not fixed, but was itself moving?

MR. ASH: Q. It is moved, and moved in the direction - against the oil by the shaking?

A. Against the oil?

Q. Yes? A. I do not agree with this at all.

Q. I understood you to say that the dish was moved? A. Yes.

Q. During one second this way, that way, backwards and forwards for some sixteen hours?

A. That is true. 10

Q. Without going into it further, don't you concede that the backwards and forwards movement is just an opposite effect to water coming up against an immovable object simpliciter?

A. No, I still believe there is a very close similarity. The point is this, at the end of each stroke, a wave comes up and meets the wall, and at the end of each stroke the end of the dish is stationary.

Q. Momentarily? A. Yes, momentarily. 20

Q. Very momentarily; comes up against the face of the oil, which is banked up against it? A. It comes back, but its actual speed in the initial movement is quite low.

Q. It does not exceed the maximum speed in the centre of its flight, but it is the shaking movement? A. That is right.

Q. The shaking which is the basis of artificial emulsification - shaking of some sort?

A. You must supply some sort of mechanical agitation to the mixture. 30

Q. Mechanical agitation? Yes, all right; and mechanical agitation produced quite a degree of turbulence, does it not? A. Yes, depending on the type of agitation.

Q. What in effect you were doing was slowing shaking the water and oil in this vessel during these relevant sixteen hours; isn't that so?

A. Yes, it is a type of shaking, with the condition that this type of shaking is not the type of shaking that you obtain - 40

Q. Not vertical shaking - horizontal shaking? A. Yes.

Q. But still shaking, producing turbulence? A. Yes, if you like.

Q. Contrast that position with you sitting on the harbour beach at Manly. We must postulate at Manly on a fairly calm day because wind does come in that quarter to some extent. The wind does come in that quarter to some extent beyond what you expect in Morts Bay; you will agree with that? A. Slightly greater, anyway.

10 Q. Whether you do or not, postulate a calm day with the tide coming in. You are aware that the tide goes in the same direction for a long time? A. Yes.

Q. And very gradually? A. Yes.

Q. And then it slowly reaches its zenith and then equally slowly and gradually recedes? A. Yes, I would agree with that.

20 Q. And if you had a film of oil floating on that, in that calm - almost calm condition - you would expect it to move very very slowly and gradually with the tide, wouldn't you? A. No, not altogether. I think you are overlooking the effect of wind on the waves. In an enclosed area the effect of wind is going to be in fact just as great, if not greater than, the effect of the tide.

Q. A wind of six miles an hour in Morts Bay? A. Quite likely.

Q. Are you serious about that? A. Yes, definitely.

30 Q. Would you like to some time to reflect on that - in a bay as big as Morts Bay? A. Yes, I think it would be quite an important effect - the effect of wind.

Q. The wind - you are imagining that it is flowing in the same direction as the tide? A. Yes, you could imagine it flowing in the same direction as the tide - running in the same direction.

40 Q. Take the position in Morts Bay, and you can take it that the particular area under consideration in Morts Bay was in a bit of a dead-end part - (Objected to).

Q. There is evidence that this particular area of Morts Bay is in a somewhat sheltered section of the bay at water level - do you follow me? A. Yes.

Q. You have the tide coming in with this oil

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
1963.

Cross-
Examination
continued.

floating on it? A. Yes.

Q. I don't mean all coming in with the tide, but the tide is acting on what is there, and lifting it up with it as the tide goes up - do you follow that picture? A. Yes, carry on.

Q. Do you follow it? I don't want to confuse you -

HIS HONOR: Q. What is there is water with oil on it. A. Yes.

MR. ASH: Q. And the tide is rising up with it? A. Yes. 10

Q. And perhaps there is some wind blowing it in, or perhaps indeed some wind operating to thin it out at the edges; do you follow me? A. Yes.

Q. In that situation, bearing in mind it is in a sheltered area of the bay - or at least, there is some evidence to that effect - do you still say that is comparable to your experiment with the oscillation of that jar? A. Yes. 20

Q. There is another effect, isn't there? You know that oil dampens the effect of movement on the water? A. It does slightly, yes.

Q. And any dampening effect of the oil in the water in your jar would be nullified by the very oscillation of your jar? A. No, I do not agree with that. It would have just the same effect in fact, dampening the wave motion.

Q. Does this thing really move that far - one, two, three - like that? A. Yes, it has a three-inch travel. 30

Q. A three-inch travel over a second? A. Yes.

HIS HONOR: Q. Not six-inches over a second? A.No, three inches.

HIS HONOR: I was not quite sure from your earlier description.

MR. ASH: Q. That movement creates waves in this, whatever substance is in it? A. That is right.

Q. And you know the wind in the harbour creates waves on the water surface, or ripples, according to its strength? A. Yes. 40

Q. And those waves are definitely subjugated by oil lying on them? A. They are reduced, yes.

Q. That is, the wind waves as I will call them?

A. Yes.

Q. At all events, there is that element present when you have not got the artificial shaking - the oil is lying there and dampening the movement?

A. When you have not got artificial shaking, yes; in other words, in the practical circumstance on the bay, is not the question: Will the oil dampen the movements?

10 Q. Yes? A. Yes, it will reduce the intensity of the waves.

Q. Do you really suggest that a rising tide - a six-hours rising tide with this oil gradually moving - very gradually - in an upwards and inwards direction is comparable to these movements second by second in your Pyrex dish? Do you really say that? A. I only said the wind is going to dampen the effect of waves; it is not going to eliminate them altogether.

20 Q. I am off that now. I am on to the gradual movement over six-hours of the rise of this tide. Do you postulate completely still conditions? A. I postulate any wind at all in either direction up to six miles an hour; while it is going on there may be waves on the water-level.

Q. And on the oil? A. Yes.

Q. A six miles an hour wind will create waves on the oil? A. Yes.

Q. Have you ever seen that phenomenon? A. I have seen it in that dish there.

30 Q. Have you ever seen waves on oil? A. I cannot say I have seen any great expanses of oil on harbour water.

Q. You envisage some waves of oil over that bay, with a wind of six miles an hour? A. Yes.

Q. And you still say that the gradual rise over six hours is comparable to this backwards and forwards movement? A. With the presence of wind, yes.

40 Q. Without the presence of wind then, is it the same? A. I am afraid I could not comment on that one.

Q. Could you possibly envisage it in your mind that it would be so? A. I just do not know.

Q. You could not imagine it without wind, could you? A. I do not know.

Defendants
Evidence

No. 29.

R.F. Tuddenham

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 29.

R.F.Tuddenham

20th February,
1963.

Cross-
Examination
continued.

Q. Apart from your scientific knowledge can you imagine it with no wind and a rising tide, that you could get a situation any way comparable to the oscillating movement going on in your dish? A. Considering that these waves in the dish were only one inch high I would say yes.

Q. And where in my hypothetical state of affairs, with a rising tide in Morts Bay and without any wind, would the waves be one inch high? A. I do not know that they would be one-inch; I am giving you my opinion. 10

Q. If there was no wind in Morts Bay while this tide is rising for six hours, do you agree that would be very different from your oscillation of your vessel with waves of one-inch produced by the oscillation itself? A. I cannot agree with that, I am afraid.

Q. You cannot? A. No.

(Witness stood down).

No. 30

No. 30.

20

J.H.Simpson

EVIDENCE OF J.H.SIMPSON

20th February,
1963.

Examination

JAMES HOUSTON SIMPSON Sworn, examined, deposed:

MR. MEARES: Q. What is your occupation?

A. Commissioner of the Maritime Services Board.

Q. Under the Act, at present is there only one Commissioner or more than one? A. No, we have three full-time and four part-time.

Q. I understand you wish to get away to-morrow because of your commitments - a general meeting of the Maritime Services Board? A. Yes, to-morrow is our full Board Meeting. 30

Q. Are you President of the Board? A. Yes.

Q. What has your experience been with it? A. I started in 1945 as a pilot, and I then progressed through the various officers - 2nd Asst. Harbour Master, 1st Asst. Harbour Master, Harbour Master, Newcastle, and then to Sydney, and then I became a Commissioner of the Board and moved through from 3rd Commissioner, Vice-President and to President. 40

Q. As far as your Harbour Master duties are concerned, tell me the period you were acting

Harbour Master or Harbour Master and the years during which you occupied that position with the Board in Sydney - very roughly? A. Full-time Harbour Master, Sydney - that would be 1954 - I cannot recollect the year correctly, but it would be for about six or eight months. Prior to that I had been Acting Harbour Master in Sydney on several occasions - varying periods.

10 Q. When you were in Sydney and were not Harbour Master or Acting Harbour Master, what were you?
A. 1st Assistant Harbour Master.

Q. There is in addition the Harbour Master, an Assistant Harbour Master, and there are Harbour Inspectors? A. Yes, that is correct. There used to be one, and it was increased to two.

20 Q. In 1951 what were your duties? A. Boarding Inspector, amongst other things - moorings and dangerous and hazardous cargoes, inspecting in ships, investigating any causes of pollution in any shape or form, whether it was oil or anything else.

Q. Insofar as any form of spillage of any substance, whether inflammable or combustible, how was any action initiated? A. We would get a report in the office from some source.

30 Q. When you say "we"? A. In the Harbour Master's Branch. We would get a report in the office from some source; it could be any source, of an alleged pollution, and we would send the shipping inspector out to investigate it.

Q. Then, having got that report, would you in the Harbour Master's Department - if I can use that expression - whoever was responsible for doing that - direct any action that you thought necessary and advisable that could be taken?
A. Yes. As I say, we would send the harbour inspector out to investigate it, and depending on whatever report he submitted, so further action might flow.

40 Q. I want only to take you to the end of 1951. Was there any means known to you of doing anything in regard to oil spillages? A. Well, yes. We had in those days - I think it was in operation in those days - oil companies had been requested to provide their own booms to contain spillages.

Q. I want you to assume that that was later.
A. Well, no - I cannot think - only that we would send an inspector out, and whatever action

Defendants
Evidence

No. 30.

J.H. Simpson

20th February,
1963.

Examination
continued.

Defendants
Evidence

No. 30.

J.H. Simpson

20th February,
 1963.

Examination
 continued.

he recommended would be proceeded with.

Q. I think you have had a look at your records in connection with this matter? A. Yes.

Q. Was the oil spillage off the Wagon Mound on the 30th October 1951 reported to you by the harbour inspector? A. I would not like to say who reported it actually to me on that date.

Q. But you were aware of it? A. Yes.

Q. Did you direct any action to be taken in any way in the sense of trying to disperse it, or get rid of it, or do anything to it? A. I do not think so. I directed a harbour inspector to go up, and I must have had some further information, which I cannot recollect at this date, because I see by the report he took one of our solicitors up - (Objected to). I must have instructed the harbour inspector to go and see what was behind it all, and what it was all about.

10

Q. And he would have reported to you? A. That would be correct.

20

Q. And to the best of your recollection and your records, you did not direct any action to be taken in regard to it? A. No.

Q. And was that because you did not think it was possible - ? (Objected to).

Q. Why was that? A. Apparently on what report he gave me at the time, I did not consider any further action was necessary.

Q. Would it have been possible to take any action to get rid of it? A. Yes.

30

Q. Assume you had not got to the stage of the equipment now directed to be made available? A. In those days we had nothing at all to disperse oil.

- Q. Would you now move further until say, 1957 - from then onwards. What is the present position? A. The present position?

Q. This is not asked of you by way of criticism. A. The present position is that oil companies have to maintain their own booms, to contain spillages in the areas where they occur. Furthermore, we have various - I don't know the exact number because it comes directly under the Harbour Master's Branch, - but we have dumps

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where chemicals are kept, and they are taken out by one of our launches and issued to the ship or the company concerned to break up the oil.

Q. I want to suggest to you that you rang Mr. Durack of Caltex in relation to this fire, and had a conversation with him in relation to the spillage? A. I might have; I cannot recollect.

Q. But you would not deny it? A. No, I would not deny it.

10 Q. Would you deny that you asked him to call on you at the Board to discuss this question?
A. No, I could not deny that.

Q. I am going to put a conversation to you only in the hope that it may refresh your memory? - (Objected to).

20 Q. Do you recall having any conversation with Mr. Durack relating to this oil spillage in your office in the Maritime Services Board? A. I might have, but I cannot recollect it, to be quite honest.

Q. I am going to suggest that on Wednesday he came in to see you, and you asked what had happened, and he told you of the oil spillage, and that ways and means were discussed of dispersing the oil, and that you told him had been investigating - or the Board had been investigating - (Objected to; disallowed).

CROSS-EXAMINATION

30 MR. ASH: Q. You worked under Captain Murchison?
A. That is correct.

Q. Did you ever know of Captain Murchison's attitude, you being his assistant, to the danger of oil on the harbour as a fire hazard? A. Depending on the type of oil, I would suggest - Captain Murchison was always very conscious of fires on the harbour.

Q. And he was the Harbour Master for some time before you came to the Port? A. That is correct.

40 Q. Did you know of the fire up near Cockatoo Island in 1943? A. No.

Q. Caused by oil on water? A. I do not know anything about it.

Q. Anyhow, you served under him during his period as Harbour Master? A. Yes.

Defendants
Evidence

No. 30

J.H. Simpson

20th February,
1963.

Examination
continued.

Cross-
Examination

Defendants
Evidence

No. 30.

J.H. Simpson

20th February,
 1963.

Cross-
 Examination
 continued.

Q. And you were aware of his attitude to the danger of oil fires being started on the harbour? A. Yes.

Q. Do you recall in regard to this spillage in 1951, the one we are speaking about, that you received a number of complaints from residents and other around the area? A. I might have; I cannot recollect.

Q. You cannot recall? A. No.

Q. Do you recall the fact that you were passing any complaints over to Caltex? A. I might have. 10

Q. Is it likely that you did? A. It could be.

Q. If you did that, I take it that you took the view it was up to them to take some measures to do something about this oil - if you passed them over? A. If we were satisfied in our mind that the oil spillage from a certain ship or a certain company, and we were getting complaints, we would suggest to the people who complained: "Put your complaints in to that company. If we take legal action, then your complaint has been registered." 20

Q. When you say legal action, you mean prosecution under the Port Regulations? A. That is correct.

Q. As regards the civil complaints by people who claimed damage to their property, you referred them to the oil company concerned? A. We would not be interested; we would refer any complaints to the oil company concerned. 30

Q. And you took the view, insofar as the oil might continue to be troublesome on the harbour, that it was a matter for the oil company? A. Correct.

Q. You were concerned only with the prosecution of the person who spilt it? A. That is correct.

Q. Do you recall saying that one of your inspectors and one of your legal staff went over - you sent them over to the ship? A. That is correct. 40

Q. Do you recall being told subsequently that there was a spillage of a couple of barrels of oil? A. I could not recollect the amount - the quantity at all.

Q. You don't remember a report being given to you in those precise terms, that there was a

spill of about a couple of barrels? A. I think that was mentioned in the report which I put a submission on.

Q. And that was what was told you, on which you based some submission; is that what you mean? A. No, if my memory serves me right, is not that what the Master of the vessel, or one of the officers of the vessel said had been spilt?

10 Q. I can only put it to you as being reported to you by one of your officers - one of those that you sent over? A. I would understand that was the conversation he had with the officers of the ship.

Q. You did not go around and inspect, yourself, personally, the extent of this oil? A. No.

Q. Did you subsequently ascertain the extent of it? A. I could not recollect.

20 MR. ASH: Q. You said that this matter was reported to you. You are quite unable to tell the Court whether any action was taken or not? You cannot recall what you did? A. No.

RE-EXAMINATION

MR. MEARES: Q. Would you look at the document I show you?

MR. MEARES: I think I should say what I propose to do.

30 Q. I propose to show you what you said seemed to be a report of pollution of the port by oil, from tanker "Wagon Mound" at Ballast Point. It seems to be initialled by you on 30th October. "J.S." are your initials? A. Yes.

Q. Mr. Ash asked you - I have forgotten the form of the question - was there some information in the report - (objected to).

HIS HONOR: He asked him whether he had been told by the Maritime Services Board people about there having been a spill of a couple of barrels.

40 MR. MEARES: Q. Do you recall that? A. That, I understand is in the report - (objected to).

MR. MEARES: I propose now to endeavour to establish what this witness was told, if my friend seeks to rely, from the answer to this question, that Capt. Simpson had the idea, after reading the report, that only a couple of

Defendants
Evidence

No. 30.

J.H. Simpson

20th February,
1963.

Cross-
Examination
continued.

Re-Examination

Defendants
Evidence

No. 30.

J.H. Simpson

20th February,
 1963.

Re-Examination
 continued.

barrels were spilt. I cannot understand any other object or purpose in asking the question. I want to establish the knowledge that Capt. Simpson had of this spillage.

HIS HONOR: Is this a report to him or by him?

MR. MEARES: It is a report which would be made to him. It does not state it is to him, but it is from the Acting Harbour Master. I am sorry. It is addressed to the Acting Harbour Master. It is signed or initialled by the Harbour Inspector, and it is initialled by the Harbour Master on 30th October by this witness. That would seem to indicate that he read it.

10

HIS HONOR: I understand his original answer, when asked about this, was that he did not remember being told that, but I think some later answers did amount to some evidence that from some source he had got some information to that effect.

MR. MEARES: Yes. Mr. Ash suggested to him that the information he had was that only a couple of barrels had been put over. I want to ask him, in the light of that suggestion, the information that he had received.

20

HIS HONOR: On the question of quantity of oil spilled?

MR. ASH: I only asked him what was reported to him as the result of the visit of his officers. He started to say something I chopped him off because it was not what I asked him, and I asked him what was reported to him and he could not remember precisely but thought that something might have been said. I did not refer to any document and the identification of that document - in answer to Your Honor's question - is nothing to do with it, in my submission. It could not possibly get in the context of the document, because I especially refrained from asking him anything and I am entitled to ask him the questions I did, in my submission, without any re-examination on the matter, in the form in which my friend wants it. He can re-examine him on that aspect, and that aspect alone. The only way my friend could get any other part of the document in is, if I referred to it, referred to the contents as the contents of it, and I specifically refrained from it.

30

40

HIS HONOR: I have some doubts as to whether you

are able to get in the document or the contents of the document as such but I think you are entitled to ask him questions as to what was reported to him on this subject matter, to clarify the situation; and here might be a case where, even on my view of it, you could call in aid the principles about refreshing recollection - from what you have said.

Defendants
Evidence

No. 30.

J.H. Simpson

23rd February,
1963.

Re-Examination
continued.

10 MR. MEARES: Q. Can you remember, from the information you received as to the extent of the spillage, of your own independent recollection? A. No. To be quite truthful, I cannot recollect. Capt. Craven might have reported - I cannot recollect - that it extended over a big area. I cannot recollect, but I would also even suggest this -

Q. First of all, I want to deal with this particularly, if I may. You have not any present recollection? A. No.

20 Q. Might I show you a document and ask you - (to Mr. Ash): I am not going to show him the contents. (Document handed to Mr. Ash for further perusal).

MR. ASH: I submit this is not a document from which he can refresh his recollection.

HIS HONOR: I understood it was made on the same day, or under his direction, or was authenticated by him in some way.

30 MR. ASH: If these signatures are correct, it was later read by him. I submit this cannot be used here to refresh recollections now.

HIS HONOR: Perhaps it cannot, but I am going to allow it to be used.

MR. MEARES: Q. Would you look at this document? I show you, first of all, the heading of it - Pollution of the Port by Oil from tanker "Wagon Mound" at Ballast Point. Do you see that? A. Yes. (Objected to).

40 Q. Do you see your signature? A. That is my signature.

Q. On the bottom of it? A. Those are my initials.

Q. Is that your writing on the top of your initials? A. That is correct. That is my writing.

Defendants
Evidence

No. 30.

J.H. Simpson

20th February,
1963.

Re-Examination
continued.

Q. Is the report addressed to you? A. Correct.

Q. From Mr. Craven? A. Correct.

Q. On 30th October? A. Correct.

Q. Did you read it on 30th October? A. I must have.

Q. And did you submit the report, in connection with the report you made? A. I must have.

Q. Would you look at the first two paragraphs, and particularly the second? A. Yes.

Q. And then what was said actually, apart from what was said in the second paragraph, what was seen at the actual place of inspection. Look at para. 6. A. Yes. 10

Q. And might I show you para. 7? A. Yes.

Q. And para. 8? A. Yes.

Q. Having refreshed your memory from that document, can you tell His Honor what information you did have as to the extent of the spillage? A. I would suggest after having read the report my conclusions - 20

HIS HONOR: Q. What information did you have?

A. I cannot recollect whether the Harbour Inspector said anything further about it.

MR. MEARES: Q. But from what he said in his report? A. In his report he says there were oil drums on the deck and he said it was somebody of the ship's officers had said only two barrels had been spilt.

Q. Was there anything else in the report that you noticed, about the extent of the spillage? A. Yes; it extended over a vast area and was concentrated on both sides of the vessel. 30

Q. And also that it extended into Mort. Bay? A. Over an extensive area.

Q. And that would indicate to you, a substantial spillage? A. Yes.

Q. And having read that report, did it occur to you as a fire danger? (Objected to; leave granted). A. The little bit I know of oil and as far as fuel oil is concerned, my understanding is that it has to be heated, and what temperature it has to be raised to, I am not aware of. But it has to be heated to some temperature before it becomes a fire hazard, before it will combust. 40

Q. I put the question to you again. With the information that you had at that time, did you consider it a fire danger? A. I would say the answer to that is no.

MR. ASH: Q. The latter part of the evidence you gave about the extent of the spill, after looking at this document - do you recollect that? A. Yes.

Q. (Approaches witness). Would you agree with me that there is nothing in this document -
10 (Objected to).

MR. MEARES: My friend can only do this by leave, but if he does it I will seek leave to tender the document. I do not mind doing that and surely this is right.

HIS HONOR: I think you were entitled to look at the document. You had looked at it before, but you were entitled to look at it, but I think if you do cross-examine to suggest that his evidence given a little while ago is not
20 consistent with the document, you may lead to a situation where the document may be tendered.

(Questions and answers marked * on p. 642 read).

MR. ASH: Q. You knew, of course, that furnace oil would burn? A. Yes.

Q. And you knew that it would burn if lit?
A. If raised to a certain temperature.

Q. You would agree that a flame or fire would raise it to a certain temperature? A. I could
30 not answer that question because I am not an expert on oil.

Q. What you knew, in 1951, was that the oil would burn if lit, but you did not know how much it had to be lit? A. Correct.

Q. Did you apply your mind to the question, in 1951, as to whether it was a fire danger or not, or were you concerned with the pollution aspect? A. I would say I was only concerned with the pollution aspect at that time.

Q. You did not direct your mind to the question at all, of whether it was a fire hazard at that stage? A. I would say at that stage, no.

Q. And all further inquiries about it, as you said, and the effects of it, were referred back to the oil company? A. That would be correct.

Defendants
Evidence

No. 30.

J.H. Simpson

20th February,
1963.

Re-Examination
continued.

Defendants
Evidence

No. 30.

Q. Would you agree with me that there is nothing in this document about the oil extending into Morts Bay? (Approaches witness). A. I would like to look at it again.

J.H. Simpson

20th February,
1963.

Q. I do not think I am misleading you by suggesting that you leave out the first paragraphs. It will only be 6, 7 and 8? A. No, para. 2, if I may read it?

Re-Examination
continued.

HIS HONOR: Do not read it at present. He does not agree that there is nothing in the document about that.

10

(Witness retired).

No. 31.

No. 31.

R.F.Tuddenham

EVIDENCE OF R.F.TUDDENHAM (continued)

20th February,
1963.

MR. ASH: Q. If I may get off that other matter for a moment, you came to the conclusion that this furnace oil of its own movement, could build up to a thickness of 1/8 inch, lying on water? A. Correct.

Cross-
Examination
continued.

Q. And that an increasing factor would be wind, which could increase that by 20%? A. That is right.

20

Q. And then again, you found that there could be a damming effect of the wind blowing the oil up against obstructions and the foreshores? A. Yes.

Q. And that could be a further increasing factor? A. No. The effect of wind is to cause an increase in the thickness of the film only in the presence of any damming effect.

30

Q. To cause what? A. The effect of wind is to increase the film thickness only when there is a damming effect.

HIS HONOR: Q. You say that you cannot then go to an additional factor? A. No.

Q. Consisting of a damming effect? A. Yes.

Q. You say that is included in the factor of which you have already spoken? A. Yes.

MR. ASH: Q. So the wind would not increase the thickness in open water? A. That is correct.

40

Q. Only when it is dammed up? A. Correct.

Q. What about the tides? A. The effect of the tide will again depend on whether the oil is dammed up.

Q. If it is dammed? A. It will be to increase the film thickness slightly. This would be a minor effect, though.

10 Q. You mentioned some contaminants, and you would expect to find on the harbour the contaminants, mainly oleic acid, is it? A. This is one particular example of a contaminant that should be found on the Harbour, oleic acid.

Q. Used engine oil and automotive grease?
A. That is right.

Q. Of course, when you have contaminants on the water, you tend to get thickening of the oil? A. Of the furnace oil.

Q. So that would be another increasing factor?
A. I do not follow that one at all.

20 Q. If you have furnace oil on uncontaminated salt water - ? A. Yes.

Q. And then you have furnace oil on contaminated salt water, with one or more of these contaminants -

MR. MEARES: The witness said he would imagine the thickness to be between 1/20th and something, if uncontaminated, and if contaminated -

30 WITNESS: No. These determinations were carried out on sea water, not necessarily clean, a sea water sample from Sydney Harbour.

MR. ASH: Q. So the sample might have had the contaminants already in it, for some of them?
A. Yes.

Q. But an increase of the contaminants would tend to increase the thickness? A. Yes.

Q. So that, as regards increasing factors of thickness, we have contaminants, damming, wind and tide, all in some degree? A. Yes. They would all tend to build up.

Defendants
Evidence

No. 31.

R.F.Tuddenham

20th February,
1963.

Cross-
Examination
continued.

Defendants
Evidence

No. 31.

R.F.Tuddenham
 20th February,
 1963.

Cross-
 Examination
 continued.

Q. As a matter of interest, should a chemical engineer know anything about those things at all? (Objected to; rejected).

Q. You were speaking of emulsion at the fore-shores, and you would agree with me that if you have a pile with oil on it and then, owing to the tide subsiding and leaving the oil on the pile - do you follow me? A. Yes.

Q. If that tended to oxidise or emulsify the, of course, with the next tide you would get a new coating of oil, if the oil was still on the water, would not you? A. No. As to this question of emulsification, you won't get any emulsification of the oil just simply by a receding tide.

10

Q. You have oil on the pile. You would not expect that to emulsify? A. Not simply by the action of the water level dropping.

Q. But after the water level has gone down, this is on the pile? A. In a thin film.

20

Q. You would not expect that to emulsify? A. No.

HIS HONOR: Q. It cannot? A. Not without the action of water actually lapping up and down on it.

Q. You have no other liquid with which it can mix, have you? A. No. I take it this is an ideal, where there is no oscillating rise and fall of the tide, just a simple dropping.

MR. ASH: Q. A simple dropping of the tide - and I will give you a little activity around the circle or perimeter of the pile. Do you follow it or have I used expressions which are too colloquial? A. In fact this movement in the water is going to be very slight indeed, if it is going to be small in comparison with the drop of the tide. Is that -

30

Q. Tell me if you do not understand me. A. No, I do not.

Q. Oil is on the outside of the pile when the tide has gone down. A. Yes.

40

Q. His Honor has put to you that, in that condition, the oil on the pile will not emulsify?

A. Not without any movement of the water around the pile.

Q. The only place where the water would be, in the normal course of events, would be at the bottom of the pile where the water was? A. Yes.

Q. Is dust a water contaminant? A. Dust is a very broad term, actually.

10 Q. Any sort of dust a contaminant? A. It depends exactly what the dust is. Normally, there is contamination falling out from the atmosphere. In laboratory experiments, it is impossible to keep the surface of water clean for more than a period of an hour or so.

Q. Would sawdust be a contaminant, for the purposes of this? A. Very likely it would contain materials that could form a contaminating film: I would not know, really.

20 Q. Would iron oxide flakes form a contaminant? A. No.

A. Not at all? A. No.

Q. It would not make any difference to the oil. I take it the stage at which you get an emulsification of oil and water depends mainly on two factors - the amount of agitation and the length of time? A. That would be right.

30 HIS HONOR: Q. To some extent, perhaps, on the thickness of your oil layer? Does that have anything to do with it? Tell me if you think it has not. I just threw that out as a suggestion. A. I cannot see any reasons, off-hand, why varying films of oil, up to a certain point, up to say one eighth of an inch, should have marked differences in the degree of emulsification.

40 MR. ASH: Q. You do not really know much on that point? Is that the position? A. No. I cannot see any reasons it should. With a very thick layer, the agitation at the surface, at the interface between the two liquids, would not be as great, I feel, and this is where emulsification really takes place.

Defendants
Evidence

No. 31.

R.F.Tuddenham

20th February,
1963.

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Cross-
Examination
continued.

Defendants
Evidence

No. 31.

R.F.Tuddenham

20th February,
 1963.

Cross-
 Examination
 continued.

Q. Well, it depends on agitation, time, and to some extent on the thickness of the oil on water. Those are three of the principal factors in reaching a stage of emulsification? A. Yes, I would agree with that.

Q. That being so, you can imagine cases where there would be emulsification, and cases where there would not be emulsification, according to the circumstances? A. I think you would really have to take each of these effects in turn, to make any generalisations on this point.

10

Q. Whether oil on water will emulsify with it depends on different circumstances; sometimes it does, and sometimes it does not. Would you agree with that? A. Yes, I would agree with that.

Q. Do you agree with me that if it is emulsified in the way you described this morning, it would not burn on the water? A. Yes.

Q. Would you also agree with me that if it is not emulsified - ? A. I think I should qualify that statement, though. It would not burn unless it was supplied with a sufficient quantity of heat to actually break the emulsion.

20

Q. Even if emulsified, a sufficient quantity of heat would break the emulsion and make it burnable, if there is such a word? A. It would have to be a considerable quantity of heat.

Q. If you can imagine a large expanse of oil on water, and we are told that it burns very rapidly, it would be a fair bet that it is not emulsified, would not it? A. I just do not know on that point.

30

Q. You do not know. Is that what you say? Take an area 250-feet by 40-feet. If the oil burned on the water, all burning rapidly, spreading along very rapidly, flames on the water, would not you agree with me that that is proof positive that that oil and that water on which it lies, are not in a state of emulsification? A. No, I do not believe it is proof positive.

40

Q. All I put to you was, it is a fair chance

that it is not emulsified. Do you agree with that? A. Yes. I would agree with that.

Defendants
Evidence

No. 31.

R.F.Tuddenham

20th February,
1963.

Q. And insofar as there is any element of doubt, it could only mean that if emulsified, it would still burn; that is the logical complement to what you said, is not it?
A. If emulsified, would still burn, if it was ignited with a sufficient quantity of heat.

Cross-
Examination
continued.

10 Q. I put to you if it burns in that condition, it is proof positive that it is not emulsified, and you said. "I cannot agree with that". It naturally follows that if it did burn in that state, either it must be emulsified or not - or partly so and partly not. Right? A. I have to make a statement on this. For the fire to be initiated, I believe there would have to be
20 free oil present on the surface. For it to be propagated, it could be propagated by the emulsion.

Q. Just as quickly as if it were not emulsified? A. No, not as quickly, but I imagine it would be quite quick, considering the heats involved.

30 Q. Even if emulsified, the propagation of the fire, once ignited, under that wharf, would be quite quick? A. I can really only base my answers to these questions on the experiments I have done with these emulsions. I have found, in fact, that they were quite difficult; in fact, I have never been able to set fire to these emulsions. Whether or not they would actually break and catch fire if a sufficient quantity of heat was applied to them, I do not know.

40 Q. You are now retracting, are you, a statement you made before, where you said you think it would burn but not so quickly, if the oil was emulsified? Are you retracting it? A. I still do not believe that it will burn as readily as the oil will.

Q. But it will burn - but not as readily? Is that right? A. I have not actually got any proof that it will burn.

Defendants
Evidence

No. 31.

R.F.Tuddenham

20th February,
1963.

Cross-
Examination
continued.

HIS HONOR: Q. But if you supposed that a considerable quantity of free oil did become ignited, would you then expect or not expect that fire would spread to adjacent emulsified oil? A. I think I would expect that.

Q. You think you would expect that? A. Yes.

MR. ASH: Q. And if it so spread, would it then be burning rapidly, but not quite as rapidly as on unemulsified oil? A. I believe myself, it would burn slowly.

Q. If it burned rapidly, as His Honor described, it would suggest to you that it is not emulsified. Do you agree with that? A. Would you repeat the question?

Q. The oil is on top and it has ignited and it has started to spread - ignited in free oil. You said that if the oil to which it was spreading was emulsified, you thought it might burn along that section of the oil fairly slowly? A. It might burn, yes.

Q. I am putting to you that if, in fact, it burned along what oil was there, having spread very quickly, that would be an indication that the oil, along which it burned, was not emulsified?

HIS HONOR: Q. That would be right, would not it? A. Yes, I suppose it would.

(Further hearing adjourned
until 10 a.m. on Thursday,
21st February 1963).

IN COMMERCIAL CAUSESNos. 3000 & 3001 of 1955CORAM: WALSH, J.

THE MILLER STEAMSHIP CO. PTY. LIMITED v. VACUUM OIL CO. PTY. LIMITED
CALTEX OIL(AUST.) PTY. LIMITED and OVERSEAS TANKSHIPS (U.K.) LIMITED

R.W. MILLER & CO. PTY. LIMITED v. SAMETWELFTH DAY - THURSDAY: 21ST FEBRUARY 1963

RONALD FREDERICK TUDDENHAM
 Cross-examination continued

In the
 Supreme Court
 of New South
 Wales

10

MR. ASH: Q. Getting back to the condition of
 this oil, assume that in another part of the
 foreshore of the Harbour, as a result of this
 oil spillage, this described the oil: it was
 very thick, it was clinging to the wall and the
 sand at the bottom of the wall, it was covered
 with oil, it was lying on the sand thick, it
 came up through your toes, and it lasted there
 for a fortnight or three weeks, it could have
 been longer, and it was gradually going away.
 There was not much change in appearance. That
 goes a little bit against emulsification in that
 area, does not it? A. No, definitely not.
 These emulsions are definitely stayable.

Defendant's
Evidence

No.31

R.F.Tuddenham

21st February
 1963

20

Cross-
 Examination
 continued.

Q. It is a bit different from your floating
 object, in your Exhibit? A. I do not see that
 at all.

Q. You will notice that one facet of your Exhibit
 is that it is a little semi-solid floating in
 water? A. Yes.

Q. It is not continuous? A. Yes.

30

Q. It has not remained there continuously for two or
 three weeks? A. We do not know at this stage. It
 has only been here one day.

Defendants
Evidence

No.31

R.F.Tuddenham
21st February
1963

Cross-
Examination
continued

Q. It is not likely to improve in continuity over the surface of the water, is it? A. I could not comment on that.

Q. Do you claim to know something about the inflammability of fuel liquids? A. Only in a general way. I am not an expert on fuels.

Q. Do you agree with this, that only liquids with a flash point lower than 200 degrees Fahrenheit are generally called flammable, but any combustible liquid, when heated to above its flash point will produce flammable vapours? A. I really think I would not be qualified to comment on this. 10

Q. "For example, heavy fuel oil, when heated above 300 degrees Fahrenheit, may release vapours as flammable as gasoline"? -

MR. MEARES: I do not think there is much dispute about this subject.

HIS HONOUR: I should think you may be in dispute on the first sentence, but not on the last.

Re-examina-
tion.

RE-EXAMINATION

20

MR. MEARES: Q. You did state, I think yesterday, that you felt that you would get, as a result of this oil being split and contaminants on the Harbour, a maximum thickness of 1/8th of an inch? A. Correct.

Q. When you used the expression "maximum", did you envisage the 1/8th of an inch as something that was probable or a very outside limit, or what? A. Actually, a very improbable limit.

Q. Mr. Ash posed to you a somewhat difficult question, as to whether, assuming there was oil combustible by a wick, in situ around the place where the fire started, the oil which had become emulsified would tend to burn? A. Yes. 30

Q. And I think you previously expressed the opinion that using a wick or putting a heated rod in oil, you could not get it to burn? A. No. I have not been able to get this emulsion to burn.

Q. Have you given any thought, or not, overnight, to this question which Mr. Ash put to you? A. Yes, I have. 40

Q. Would you tell us what are your view, and would you please say as to whether or not they are certain view or probable, or the degree of comfort you feel in regard to them? A. My views are that if a quantity of oil is ignited, a sufficiently high tempera-

ture would be produced in the vicinity of the burning oil to actually cause the water content in the emulsion to boil. This would have the effect of causing the particles in the emulsion to be expelled violently from the liquid. The effect of this violent expulsion would be an increase in the surface area of the emulsion available for burning. It is a well-known fact that an increase in the surface area of an inflammable liquid produced, for example, by atomization with air, has the effect of enabling the oil to burn much more readily.

10 Q. Would you envisage that if an area of the oil was fired as a result of a wick, geometrically progressively increased, there would be a very substantial heat generated? A. Yes.

Q. We have heard, I think, that the heat of a match is over 1,000 -

MR. ASH: 3,000.

20 MR. MEARES: Q. Would the heat you envisage from an area of fuel oil which was alight, an area of some size, have a heat very much in excess? A. Yes. I think I should explain this in some detail. The quantity of heat liberated would be very much greater the larger the volume of oil ignited. An analogy I would make here is a fire produced by a few blocks of wood. You can approach a fire of that size to within a couple of inches, or six

30 inches, but now say you set a house on fire. You cannot approach that house within any such limits. At a given distance, the temperature will be very much greater, the larger the object on fire.

Q. I think you used the expression that with atomization, it would cause the emulsion to spit? A. Yes, spit. You get a spitting in the laboratory, of course, where the temperature is increased very much more rapidly say, for example, in a quantity of oil burning on water. The action, I should say, would be very much more violent than this.

40 Generally you could describe it as spitting, though.

Q. When you use the expression "spitting", one thinks of a frying pan when the fire gets too hot. Would that be an example of spitting? A. Yes. You get this effect wherever you heat a liquid, such as water in oil, above boiling point. For example, in a laboratory, if you heat a high boiling oil, containing drops of water, up to boiling point, it is a very dangerous practice, because of the

50 expulsion of the oil.

Defendants
Evidence

No.31

R.F.Tuddenham

21st February
1963

Re-Examination
continued

Defendants
Evidence

No.31

R.F.Tuddenham

21st February
1963.

Re-Examination
continued.

HIS HONOUR: Q. I think I understand completely what you say about the view that the water content of an emulsion might boil, but I do not follow it - no doubt entirely my fault - when you go on to speak of an increase in surface area. I do not follow it as relevant to the sort of problem we have in this case. Could you help me on that? A. Yes. I would like you to consider a layer of this emulsion floating on the surface of the water. It has a given surface area, between the emulsion and the air, and this is the area over which burning can occur. Now if you cause some of this emulsion to be expelled into the air, in the form of very small droplets, you get a very vast increase in the surface area between the oil and the air.

10

MR. MEARES: Q. Is this another way of putting it, that when you get this thing, semi-solid mass, heated to a certain temperature, with the oil evaporating out of it, you get this spitting and, as a result of it, the semi-solid mass disintegrates and the oil constituents of it form a greater slick or surface than the semi-solid mass? Is that right or wrong? A. No. This is not quite what I mean. I envisage that the bulk of this emulsified material will be expelled into the air in the form of very small droplets and under this condition the surface area will be vastly increased. Suppose, for example, we take a small block of wood and cut this into a million pieces. The volume is the same but the surface area is increased fantastically.

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HIS HONOUR: Q. You are thinking of these droplets, as you call them, in the air? A. Yes.

Q. I thought you were talking of what I might call a horizontal spread of the surface? A. No. I am sorry, I did not make that clear.

HIS HONOUR: I understand now what you are trying to put, whether it is right or not.

(Witness retired)

MR. MEARES: Captain Craven rang me concerning the evidence he gave yesterday, when he said he came from Newcastle in December 1945. It should have been December 1944.

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No.32

N.D.McMahon

21st February
1963

Examination

No. 32
Evidence of N.D. McMahon

NATAL DOUGLAS McMAHON
Sworn, examined as under:

MR. MEARES: Q. I think your full name is Natal Douglas McMahon? A. Yes.

Q. Where are you now living? A. Summer Hill.

Q. Whereabouts? A. Chilton Flats, Allman Avenue, Summer Hill.

Defendants
Evidence

Q. I think you are now employed with the Department of the Interior, Commonwealth Government?

No.32

A. That is correct.

N.D.McMahon

Q. In 1951, at the time of the spillage of oil with which we are concerned in this case, you were the Fourth Mate of the "Wagon Mound". A That is correct.

21st February
1963

A. And prior to that you had been to sea, from 1943 continuously, with the exception of two breaks of six months? A. That is right.

Examination
continued.

Q. And during that time you had spent nearly all your time on oil-burning ships? A. That is right.

Q. And for some four years - am I right - prior to 1951, you had been on tank ships? A. Three years.

Q. And you continued on in tank ships from the time of the spillage until 1953, and from 1953 to 1958 you were on ships other than tank ships, all of which were oil-burning ships? A. Yes.

Q. Then you served on those ships in the various capacities of Third and Second Officer and, at times, Relieving Chief Officer? A. Yes, for just a short period.

Q. And since 1958, you have had nothing to do with the sea, from the point of view of earning a living? A. No.

Q. I think you gave evidence in the previous case, before Kinsella, J., concerning an alleged spillage of petrol which took place in the morning of the day the ship berthed. Is that correct? A. Yes.

HIS HONOUR: Is that right? It came in on the 29th, did not it?

MR. MEARES: Q. However, in the early morning on which the "Wagon Mound" sailed, which was the 30th, you were on watch during the oil spillage and, in fact, from half past midnight on the 30th until about half past four on the 30th? A. Those times are vague, of course, but that would be approximately correct.

Q. When I say half past four, I refer to the morning.? A. Yes, I understand.

Q. Do you remember first noticing a spillage or some evidence of it? A. Yes, I am quite clear about it.

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Defendants
Evidence

No.32

N.D.McMahon

21st February
 1963

Examination
 continued.

Q. Where were you at the time? A. I was standing right on the after deck of the tanker, very close to the pumproom, where you check your pressures.

Q. What did you first notice that suggested oil?

A. This particular morning it was blowing quite hard and I went to wipe my face - I thought it was just water, a little spray. It proved to be oil. Oil, of course, means trouble somewhere -

Q. Was that at about four o'clock in the morning?

A. As near as I can remember, approximately so, yes. 10

Q. At that time I think you were also discharging kerosene? A. Well, it would have been kerosene or dieseline or petrol.

Q. Yes, but you were discharging? - A. Yes.

Q. What did you do? A. There was no evidence of anything wrong on the after deck, so I ran forward to see if anything had happened there. When I reached the alleyway, the for'ard door on the alleyway underneath the amidships accommodation, I could see this oil-bunker tank overflowing. 20

Q. Did you run along the starboard side of the ship and along the starboard alleyway? A. Yes, just through that alleyway. It is only a short one.

Q. What did you see when you got there? A. I could see the oil pouring out of this oil fuel tank, for'ard bunker tank.

Q. And it was the for'ard bunker tank on the starboard or port side? A. The one I saw was on the starboard side. I did not look at the port one. 30

Q. And did you form the impression that the oil was still being pumped? A. I did.

Q. And what did you do? A. I thought the best way, the quickest way, would be to go to the barge which was pumping the oil on board, and there was no one on the deck of the barge.

Q. Did you rush over to the port side? A. Yes, from the starboard side across to the port side of the ship. No one answered me immediately and I thought -

Q. Just tell us what you did. A. I went back along the after deck, I ran back looking for the Engineer and I found him at one of the after fuel tanks, trying to open a valve. 40

Q. May I take it, - correct me if I am wrong, that you ran along the port side and through the port alley? A. No. I had come out of the alleyway before I came back from the barge, so that I had a clear deck to run along.

Defendants
Evidence

No.32

N.D.McMahon

21st February
1963

Examination
continued.

Q. The purpose, if any, in trying to release this valve, is what? A. If you have any tank and you have another one overflowing, if it is on a lower level it will automatically take all the oil being pumped.

Q. What happened? A. We could not get that valve opened. We did not waste any time with it. It was obvious it was going to be a big job and so we both went back to the barge and I am not quite clear, but they had either shut down or they answered us. By this time I had left it to the Engineer. It was his responsibility. I was with him and that is all.

Q. The point I want to make clear is that when you rushed back to the barge did you then or thereafter and, if so when, notice that the pumping had stopped? A. After the Engineer had contacted the barge the pumping would have stopped. Naturally we went for'ard then, to check that it had stopped.

Q. It had stopped when you went for'ard? A. Yes.

Q. Could you indicate, to the best of your ability, the period of time that elapsed from when you noticed this spray on your face, aft, to the time the pumping stopped? A. Well, until the time pumping did stop - it is difficult to give an accurate time. I would say not more than two or three minutes.

Q. I think a short time thereafter you turned in?

A. That is right.

Q. And you were on watch when the ship moved out, and I think she moved out, according to the log, at nine minutes past eleven? A. Well, I do not remember.

Q. If you swore so in your previous evidence, would that be correct? A. Yes.

Q. Of course you observed this oil, first of all, may I take it, on the deck? A. Yes.

Q. When did you observe it? A. Well, when we first saw the tank overflowing and then when we went back for'ard again to check it; there was definitely oil there.

Q. Could you give the Court an idea of its extent? A. Not very accurately. The ship was trimmed well by the stern, meaning that the oil had flowed down on to the after part of the for'ard deck, against the housing that supported our accommodation and bridge, etc., the structure.

Q. May I take it that it was free to go past there? A. No. It had stopped there. It could not get past.

Defendants
Evidence

No. 32

N.D. McMahon

21st February
1963

Examination
continued.

Q. Why? A. Well, you had watertight doors to this alleyway that I am referring to, which is used as a storeroom and general workroom. They had sills on them which would be at least two feet six inches high and before it could reach that height of 2 ft. 6 inches on deck, it would simply have flowed over the side.

Q. How high were your scuppers? A. The scuppers are right on the deck plates, level with the deck plates, so as to take care of all drainage.

10

Q. If you took the scuppers, for instance, on the starboard side from the bridge, where the oil was blocked unless it reached a height of two feet six inches, to the most for'ard part of the deck on the port side, could you give us any idea of how many scupper holes there would be through which oil could flow? Am I right in imagining that the scupper is not one long escape?
A. No, it is only just a small hole.

20

Q. And the holes are here and there? A. Yes. I think there were three on each side of those ships, on the for'ard deck, but the oil would not have reached that one, because it was trimmed. It is standard tanker practice to trim them well by the stern and the oil would have flown over the sheer strake -

Q. What is a sheer strake? A. It is the uppermost strip of plating on the hull. It projects about, on those ships, four inches above deck level.

30

Q. In other words, if you try to roll something from the deck into the water, you would be obstructed by a piece of metal running all along either side, four inches high? A. Approximately four inches.

HIS HONOUR: Q. You were speaking of the escape holes? A. Yes.

Q. You said there were three on each side of the for'ard deck. A. I cannot quite remember. There were either two or three on either side.

40

MR. MEARES: Q. And you point out that the most for'ard one on the starboard side, assuming the oil was pumping out of the for'ard bunker tank on the starboard side, would not be a means of allowing oil through, because the ship was trimmed aft? A. Yes.

Q. And the oil would flow? A. Straight down the deck.

Q. Not up to the for'ard scupper hole but to the one or two holes aft of the most for'ard scupper holes? A . Yes.

Defendants
Evidence

No.32

N.D.McMahon

21st February
1963

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HIS HONOUR: Q. Am I to suppose that it might flow on both sides of the ship, both starboard and port sides or, would it be confined to one side? A. No. It would depend on the ship having a list. In this particular case I think that it must have found its own level because, if I remember rightly, there was oil on both sides.

Examination
continued.

Q. MR. MEARES: Did you observe, after you saw the escape of oil, at any time after, whether any of the scupper holes on the port or starboard, for'ard of the bridge housing, were plugged? A. First of all, it is standard tanker practice -

Q. I do not think you can say that. A. I am just coming to the question -

Q. You cannot say that.

20

HIS HONOUR: Q. Did you see whether they were plugged? A. Yes. I saw one and the Engineer checked the other one. We both went together and checked. I did see one.

MR. MEARES: Q. Which one was that? A. I went to the starboard side, I think.

Q. When you went up there and had a look around, what was the extent of the oil free on the for'ard deck? A. That is a difficult question now.

30

Q. Can we imagine that it was three feet thick, or inches thick, or - A. Oh no, a few inches deep, but not over the entire foredeck.

Q. Then I think subsequently, you observed that the oil had spread and got on to the Harbour and it seemed to be, so far as you could see, contained between - Where was it contained? A. I do not remember. It is too long ago now for me to say whether it was here or there. I was not concerned. It was my Senior's responsibility.

40

Q. Do you remember seeing it in any place? A. Well, I would have noticed the oil on the water surrounding the ship but -

Q. Do you remember giving evidence about this matter in 1958? A. I remember giving evidence, yes.

MR. MEARES: Q. Would your Honour permit me to put it to him, p.235?

MR. ASH: I would rather he be asked a few more leading questions.

Defendants
Evidence

No.32

N.D.McMahon
 21st February
 1963

Examination
 continued.

MR. MEARES: Q. Do you remember the ship, after the spillage - you need not worry about when - acquired a starboard list? A. I have a vague recollection of giving evidence to that effect.

Q. When you say giving evidence - A. Yes, but it is only vague, and I thought this was all finished, and I had no personal interest in the matter.

Q. Are you able now to recall the ship getting into a starboard list? A. No. I am afraid I cannot. I do recall giving evidence of some sort to that effect, but as to time and how much, I could not say. 10

Q. Do you recall stating that, so far as you could see, it was trapped between the "Wagon Mound" on the one side, and the piles of the wharf? A. Yes. There again I have a vague recollection of giving that evidence, but to go back to the occurrence, I could not. 20

Q. You said in your evidence the oil was trapped, in 1948 - (Objected to.)

Q. Did you at any time consider this spillage, or not, a fire hazard? A. No. I have seen them often. They are a breach of Harbour Regulations and you are very upset about them, but that is all.

HIS HONOUR: Q. You say you have seen a spillage of oil, often? A. Well, possibly in my time I would see five, possibly even eight times. 30

Q. As big as this one? A. Nearly, some.

MR. MEARES: Q. But you did not consider this a fire hazard? A. No.

Q. Have you had any experience of the simplicity or difficulty with which this fuel oil could be ignited? A. I have.

Q. At this time? A. Not at sea. That was not my department, but I have since I have been ashore. 40

Q. And what have you observed? A. It is extremely difficult and contankerous stuff to get to burn.

Q. Under what circumstances? A. The only way I have seen it has been in oil-fired furnaces which use the type of oil. It has a high pressure, a fan. It has to be sprayed through a nozzle and also, to start a cold furnace it

is extremely difficult. It keeps on going out and you have to keep on relighting it with wads of kerosene-soaked cloth, or something like that.

Defendants
Evidence

No.32

N.D.McMahon

21st February
1963

Examination
continued. .

Q. Is it, from what you have seen, something that sometimes takes as long as a couple of seconds or a couple of minutes to successfully light? A. I personally, starting it in a cold furnace, have spent as long as an hour or two hours trying to get it to burn.

10 Q. So far as bilges are concerned, do you get in your bilges usually, or at any time, scum and slicks of anything? A. You can, yes. They should be cleaned regularly, and also they are inspected by the ships' surveyors when the ship comes up for a navigation certificate. It is not usual. It is an ill-run ship that does get dirty bilges.

Q. The idea is to keep them as clean as possible, is it not? A. Yes.

CROSS-EXAMINATION

Cross
examina-
tion

20 MR. ASH: Q. When you got up there, you said it was pouring out of the tank? A. Yes.

Q. Of course, you were attracted to it by the spray on your face? A. Yes.

Q. The bunkering was no concern of yours whatever, I take it? A. I was not responsible.

Q. You were going off pretty soon afterwards, you were you not? A. Yes.

Q. You got up there and all you saw was this stuff pouring out? A. Yes.

30 Q. You would have no idea how long it had been pouring out? A. No, but it is very unlikely it would go on for very long without being noticed.

Q. That is assuming those noticing it, or in charge of noticing it, were exercising care. You do not know how long, in fact, do you? A. I cannot swear.

Q. And it was you who drew the attention of the Engineer to it? A. No. The Engineer had already seen it, because he was at the valve when I found him.

HIS HONOUR: Q. Which engineer was this at the valve? A. I think it was the fourth Engineer, I am not sure.

40 MR. ASH: Q. This valve allows something to be opened, to let a part of the oil of one tank go into another? A. Yes.

Q. You say you went up an alleyway in the deckhouse? A. Yes.

Defendants
Evidence

No.32

N.D.McMahon

21st February
1963

Cross-
Examination
continued

Q. And immediately you got through, it was obvious that the bunker tank was over-flowing? A. Yes.

Q. And I think you agreed you were definitely certain, from what you saw there, that the pumping, at that moment, was still continuing? A. Yes.

Q. You said you saw the Engineer trying to open a valve, when you went back later on, and he was having some difficulty loosening it? A.Yes. 10

Q. And it was apparently very tight, from what you could see? A. Yes.

Q. I think you indeed, gave him a hand with it; did you? A. I cannot swear but I believe I did, yes.

Q. You remember the fact of giving evidence? A. Yes.

Q And what you then said? A. Yes.

Q. Would you agree with this, that two of you could not open it, the two of you using such strength as nature gave you? A, Well, I would not have put it that way, I do not think. 20

Q. If I put to you that you answered Yes to that question, would you agree that that was probably the position? A. Yes.

Q. It was put around the other way, with the same effect. I put it to you the question was, "But you could not open it, just the two of you, using such strength as nature gave you?" and you said "No, you could not open it"? A. We could not open the valve. 30

Q. It is perfectly clear that there was nobody on the starboard side up near where it was coming out of the hatch; there was no man there when you went up? You agree with that? A. Yes.

Q. I think the position was that when you saw it, you yourself did not know what to do and you went looking for the Engineer? A. No, I went to the barge.

Q. But you yourself did not know what to do about it? A. No. I would not have known which valves, to correct it, on the ship. 40

Q. You did not know the bunker tank system of the Engineer? A. No.

Q. In fact, putting it bluntly, it was no concern of yours and you did not care about it? A. Except for the general safety and running of the ship, No I did not.

Defendants
Evidence

No.32

N.D.McMahon

21st February
 1963

Cross-
 Examination
 continued

Q. You say you cannot remember the extent of the oil on the Harbour. But what time was it when you were up there on the deck, four in the morning or thereabouts? A. When the bunkers overflowed?

Q. Yes. A. It would be, approximately.

Q. I suppose you have sailed as an officer quite a bit, on a ship? A. Since 1948 until three and a half years ago.

10 Q. And you will agree with me that the greatest fear of a mariner is fire? (Objected to; rejected.)

Q. You will agree with me that there are rigidly enforced precautions about the escape of oil of any type, on a boat? A. Yes.

Q. And that the major reason for such care and precautions is the risk of fire? (Objected to; allowed).

Q. That is the question, is not it? A. No, it is not. It is mainly a question of pollution of harbours.

20 Q. You still carry on your precautions when you are out of the Harbour, don't you? (Objected to; rejected).

Q. These precautions in relation to the spillage of oil are observed at all times on a ship, are they not? A. No. On a tanker particularly, particularly with clean oil ships, you have no danger, no risk of danger of fire, until you come alongside and start discharging, and in that case you have men standing by, two pump men for instance; your hoses will be rigged, whilst water is not normally used if you can avoid it, and your fire extinguishers are always handy. They are fitted in places
 30 where you can get them quickly, but you are much more cautious when that stuff starts going over the side at the rate of 100 tons an hour.

Q. Because, as you said earlier, that is when you start to worry about fire? A. That is with clean oil, not bunker oil.

Q. Don't you take any precautions with bunker oil? A. No.

Q. None at all? A. Except to be careful with it, that you do not spill it in the Harbour.

40 Q. That is all you are worrying about? A. Overflow of your tanks, burst pipelines and things like that, you worry about them, but you do not take any fire precautions.

Q. None at all? A. Well, I have not seen them.

Q. You have seen them neither at sea nor in port, in relation to bunker oil? A. No.

Defendants
Evidence

No. 32

N.D. McMahon

21st February
1963.

Cross-
Examination
continued.

Q. You do carry fire extinguishers? A. Of course, also a complicated system of extinguishers. It is carbon dioxide usually, which feeds in the holes or tanks of these ships and which can be operated through a system of valves - a battery of big cylinders. It is a smothering agent.

Q. What do you want to smother it for? (Objected to).
What was the purpose of smothering it? (Objected to).

Q. An agent to smother what? A. In the event that there may occur a fire. You never know. Some fool might throw a match into a pool of gasoline. You do not have gasoline pools at sea, though.

10

Q. But you have your fire precautions, and you have fire extinguishers down the engineroom, don't you? A. Yes.

Q. And you have fire drill? A. Yes.

Q. You know, of course, that fuel oil will burn if it is heated? A. Yes.

Q. Or ignited? A. Yes.

Q. And you know that if ignited, and it does burn, it burns very rapidly and fiercely? A. Well, it must be fanned.

20

Q. You have not seen it burning, have you, in quantity? A. No.

Q. Part of your precautions are in not permitting the accumulation of oil anywhere on the ship?
A. Yes.

Q. And there are very stringent precautions against spillage over the ship? A. Yes.

Q. You have never been an engineer at sea, have you? A. No.

30

Q. And the handling of all bunker oil is, I think, as you said, entirely a matter for the Engineer and his engineers? A. Yes.

Q. And you would be the first to say that any engineer officer on a ship should know, if he is competent, a great deal more about bunkering oil and the handling of it, and the risk of it, than a non-engineering officer? A. Yes.

Q. Would you agree with this statement, that there must always be present some risk of laden oil tankers moving in restricted waters being involved in collision, and of oil in large quantities in consequence being released into the sea. Once there it will spread rapidly on the surface, of its own accord, and be carried by wind and tide to other parts of the port area? A. Correct.

40

Q. "The fire hazard it there presents is both obvious and great"? A. I think you are speaking there of two different types of oil.

Defendants
Evidence

No.32

Q. You would agree with those remarks in respect of every oil except bunker oil, would you? A. Correct.

N.D.McMahon

Q. You did, of course, leave at ten past eleven with the "Wagon Mound"? A. I do not remember the time.

21st Feb-
ruary 1963

Q. You left with the "Wagon Mound"? A. Yes.

10 Q. And you did not direct your mind to an examination of the extent of the oil over the Harbour at that stage, did you? A. No.

Cross-
Examination
continued.

Q. And you did not direct your mind to the effect of it at all, did you? A. No.

Q. It was not your business, was it? A. No.

Q. As Fourth Officer, it was not your business? A. It was the job of someone to get the stuff cleaned up, so far as I was concerned.

20 Q. And you, at that stage, did not direct your mind to the effects of it, or the fire risk of it, or anything, did you? A. Well, no. (Objected to by Mr. Ash; the latter part of answer struck out by direction).

Q. You did not direct your mind to the matter particularly as you left, yourself? A. No.

Q. I suppose your commonsense tells you that a small spillage in a small area of say a ten-foot circle or something like that, is a very different thing from a spillage that goes over substantial parts of a Harbour? (Objected to; rejected).

30 Q. Would you agree with this, that before bunkering or transferring bunkers, you should be sure that any excess fuel can overflow safely into another storage tank in which there is sufficient reserve capacity, or would you prefer not to express an opinion on it? A. Well, it sounds like commonsense, but I do not know. It is not my department.

Q. To cut it short, any view you have expressed as to the handling of oil or the risk of it - you would agree that any engineer officer would be expected to know far far more than you? A. Correct.

40

RE-EXAMINATION

Re-Examination

MR. MEARES: Q. (BY LEAVE) The Fourth Engineer was a gentleman by the name of Suede? A. I cannot remember now.

Defendants
Evidence

No.32

N.D.McMahon

21st February
1963

Re-examination
continued

Q. However, the Engineer Officer that you saw at the starboard side aft, and with whom you were engaged in endeavouring to loosen the valve, and with whom you were afterwards when he was inspecting the oil - did you notice in any way anything unusual about his condition, any question of insobriety? A. No.

(Witness retired).

No.33

Evidence of H.J. MacAnalley

H.J.MacAnalley
No.33

21st February
1963

Examination

HENRY JOHN MacANALLEY
Sworn, examined as under:

10

MR. HOLLAND: Q. Is your full name Henry John MacAnalley? A. That is! At present live at Lakeview Drive, Burrill Lake? A. Yes.

Q. You were formerly employed by Caltex (Aust) Pty. Limited, were you not? A. Yes.

Q. At the depot at Ballast Point? A. Yes.

Q. I think you were with Caltex altogether 31½ years? A. Yes.

Q. And you left the employment of Caltex in August 1961? A. Yes.

20

Q. Were you, in 1951, and particularly in October and November of that year, the shipping foreman for Caltex at their depot at Ballast Point? A. Yes.

Q. Did your duties include the receiving of all cargo that was destined for that depot? A. Yes.

Q. I think you had been, for many years, actually engaged at that depot in receiving such cargo? A. Yes.

30

Q. In fact, apart from one or two short breaks, you were at Ballast Point throughout the whole of your employment with Caltex? A. Yes.

Q. From time to time did quantities of bunker oil come into the depot at Ballast Point? A. Yes.

Q. Who handled the receipt and despatch of bunker oils that came into Ballast Point up to November 1951? A. I did.

HIS HONOUR: For what period does he say this was happening up to November 1951?

40

MR. HOLLAND: Q. Over what period, prior to 1951, had bunker oil been received at the Ballast Point depot? A. I could not tell you that now. There was some prior to that, we used to receive from overseas. But it is too far back to remember how much oil we got. I know there were a few shipments in.

HIS HONOUR: I thought from Mr. Durack's evidence that they did not start on bunker oil installations there until about 1951.

MR. HOLLAND: It is true he said that, and your Honour will recall he said he started there only in October 1951 and he presumed, as far as he knew, that they did not have bunker oil, but this witness says they did have bunker oil.

10 Q. Although you cannot give us specific quantities, could you give the Court some idea of the quantity of bunker oil you would have handled, as a minimum? A. I would not say the exact quantity, but it would run into a couple of million gallons. It may be more.

Q. Were you aware of the significance of the expression "flash point" in connection with oil at all? A. Oh yes.

20 Q. Had you yourself carried out flash point tests from time to time? A. I have.

Q. Do you know what was the flash point of the bunker oil which had been received at the Caltex Depot through your hands, prior to November 1951? I would say a fair average flash point would be 190 degrees.

Q. Would some of it be lower and some higher? A. Some may be a shade lower and some may be a little bit higher.

30 Q. What would be the lowest, in your experience there, you had handled into the depot? A. I would say somewhere about 180 degrees may be the lowest.

Q. You were on duty at Ballast Point when the "Wagon Mound" berthed on Monday, 29th October 1951? A. Yes.

Q. Do you recall what time she came in? A. She came in in the morning, but I could not tell you exactly what time she came in.

Q. Do you recall when she left? A. The following day, just before midday.

40 MR. ASH: There is no dispute about that time; 11.09 I think she cast off.

MR. HOLLAND: Q. I think from the time she came in, until she left, you were on duty, except for a period from 6.30 or 7.00 on the evening of the 29th until 11.00 p.m. on the 29th? A. Somewhere about those times.

Q. The rest of the time you were on duty? A. Yes.

Defendants
Evidence

No. 33

H. J. MacAnalley

21st February
1963

Examination
continued.

Defendants
Evidence

No.33

H.J.MacAnalley

21st February
1963

Examination
continued.

Q. Do you recall that the vessel was taking in bunkers from a bunkering barge? A. Yes.

Q. At some time, I think you heard, there had been an oil spillage? A. Yes, I heard that. I was told.

Q. What time was that? A. The following morning, just about daylight. I cannot tell you the time.

Q. Did you go and have a look? A. Yes.

Q. What did you find? A. That there was a certain amount of oil just trickling down the side of that particular ship. Most of it had run away from the ship's side, but there was oil, in patches, under the wharf. 10

Q. Under your own wharf? A. Under our own wharf, and backed up against a lighter we had at the end of the wharf.

Q. Which end of the wharf? Was it the bow or stern end of the "Wagon Mound"? A. About the southern end.

Q. Would that be the end nearest to Yeend Street? A. Yes. 20

Q. Could you see the oil anywhere else? A. Yes. I started to look around then and the oil was down past Yeend Street and was down alongside the sea-wall in a stream, I would say seven or eight or nine feet wide.

Q. From where? A. From the wall.

Q. Extending in a direction toward - A. - the Yeend Street wharf.

Q. Did you see how far and beyond the Yeend Street wharf it extended? A. No, I could not see that. I only went down as far as the wharf. 30

Q. You did go down to the Yeend Street wharf, did you? A. Yes.

Q. Did you look under the Sheerlegs Wharf? A. No, but I could see from the appearance of the oil that it was under the Sheerlegs Wharf at the time.

Q. What sort of oil did it appear to you to be? A. Black fuel oil.

Q. What sort of an appearance did the oil present on the surface? A. Just a black shiny appearance. 40

Q. Was it uniform in its extent? A. It just appeared to thin out towards the outside edges.

Q. Was it a continuous stream or was it in patches, or what? A. No. From our wharf to Yeend Street Wharf it was a continuous stream.

Q. What about under your own wharf? A. Under our own wharf it was more patches, because the tide was running in at the time and it was taking it away.

Defendants
Evidence

No.33

Q. At that time, did you consider, from your knowledge and experience of this oil, whether or not it was a fire danger? A. No. I did not consider it a fire hazard at all.

H.J.MacAnalley

21st February

1963

10

Q. You have told us it was in patches under your wharf. As far as fire danger under your own wharf is concerned, was your view as to its not being a fire danger dependent on it being in patches? A. No. If it had been all over, I would not have considered it a fire danger.

Examination
continued.

Q. You recollect Mr. Durack, the Superintendent, coming to work that morning? A. Yes.

Q. Do you recall the time? A. Before the men started at half past seven.

Q. Did you have a discussion with him about it? A. Yes. I told him - (Objected to).

20

Q. Do not answer this for a moment. Did Mr. Durack ask your opinion as to whether or not this oil presented a fire danger? (Objected to; not pressed).

Q. Subsequently I think you went with Mr. Durack around to the Morts Dock area, to see the manager of Morts Dock & Engineering Company, Mr. Parkin? A. Yes.

Q. Do you recall that? A. Yes.

Q. Do you remember when that was? A. In the afternoon, I would say from memory now, about three o'clock.

30

Q. And you saw Mr. Parkin. Did you inspect the area there, as to oil? A. Yes.

Q. Where were you when you made the inspection? A. We went around to the Morts Dock office. I drove around there and walked back over the sill of the dock, the gate of the dock, and across through their shed there, on the other side of the dock - or it was there - and across the slipway, and finished up over on the Sheerlegs Wharf; walked right around the foreshores there.

HIS HONOUR: Q. You went up on to the Sheerlegs wharf? A. Yes, we finished up going on to the Sheerlegs Wharf.

40

Q. Did you go up the steps that lead up at the Morts Dock end of the wharf? A. I think there are steps there somewhere.

Q. Of course, you were going on foot, were you, at the time you are speaking of? A. Yes.

Defendants
Evidence

No.33

H.J.MacAnalley

21st February
1963

Examination
continued.

Q. I wondered whether you had come down the steps to look under the wharf from the steps? A. No. I could not tell you, but we got down there somehow and had a look under the wharf and later on we went down to the other end of the wharf, Yeend Street, and got down and had a look under the wharf from that side.

MR. HOLLAND: Q. Starting at the reverse end of your tour of inspection, tell His Honour what you saw in regard to oil under the Sheerlegs Wharf? 10

A. Yes. There were oil patches under the wharf. Where the foreshore was coated and the tide went down, it left a certain amount of oil behind it, and it was coated right along, and there was a small collar of oil around each pile. The oil hangs to the pile as the tide goes down.

Q. I suppose you saw the "Corrimal" tied up alongside the wharf? A. Yes.

Q. Was there any oil up against the side of the "Corrimal"? A. I do not know. 20

Q. You have told us about the patches and the marking on the retaining wall, and the collar around the piles. Did that condition exist for the full length of the area underneath the Sheerlegs Wharf, or part of it, or what? A. It was right along, in patches.

Q. Going back further toward the dock, what was the condition there? A. We got up under the slipway there and, where the tide had risen and started to fall again, it left a coating of oil all over the slipway. 30

Q. As regards the oil you saw on the water, were you able to tell its thickness? A. No, but it was not very thick.

Q. At the time of your inspection, do you recall if there was any welding or cutting or burning going on? A. I could not tell you. I cannot recall that.

Q. You knew, did you not, that ship repairing activities involving oxy and electric welding and oxy burning, were carried on regularly from time to time, at the Sheerlegs Wharf? A. Yes.

Q. Did that fact make any difference to your view as to the fire danger of this oil? A. No.

Q. Did you do anything for the protection of your own depot, in relation to the oil under your own wharf? A. No.

Q. Did you take any steps at all? A. No.

Defendants
Evidence

Q. You became aware of this spillage, you say, about daylight on the 30th. At that time was the "Wagon Mound" still discharging? A. Yes.

No.33

Q. Do you recall what type of produce she was discharging? A. I do not recall that.

H.J.MacAnalley

Q. Do you recall the products which she carried? A. She used to carry gasoline and kerosene and, I think, distillate. I could not swear to it now.

21st February
1963

10 Q. Did the discharging of those fuels or one of them or more, continue after the time you observed the spillage? A. Yes.

Examination
continued.

Q. Up till about what time, do you think? A. I would say somewhere about nine o'clock or so, eight or nine o'clock. That is as far as I can tell you now. It is a long while ago.

(Short adjournment)

Q. Do you recollect the fire happening at Morts Dock? A. Yes.

20 MR. ASH: There is no dispute.

MR. HOLLAND: Q. When was this? A. On the Thursday.

Q. Where were you at the time? A. In our main office at Ballast Point.

Q. What was the first you knew about the fire? A. Somebody called out, "There is a fire at Morts Dock". Of course we all went to have a look at it, to see if it was approaching our terminal.

30 Q. Did you do anything about it? A. We got all our own local fire-fighters into position and I went down to the wharf to see where the fire was and what was happening.

CROSS-EXAMINATION

Cross
Examina-
tion

MR. MEARES: That correction of December 1945 to December 1944 concerns p.542.

MR. ASH: Q. When you arrived there, when you went down to the fire, the first thing you saw was the "Corrimal" alight, was not it? A. We saw the "Corrimal" alight from the office.

Q. Your office is up next to Mr. Durack's office, is not it? A. Yes.

Q. You have extensive fire precautions at your own place at Ballast Point, have not you? A. Yes.

Defendants
Evidence

No.33

H.J.MacAnalley

21st February
 1963

Cross-
 Examination
 continued.

Q. And you always have had them? A. Yes, always.

Q. And they are very strictly observed, are they not? A. They are.

Q. And I support the reason they are so strictly observed is that there might be a fire in case of any spillage? A. No. That is part of the reason they are observed there, but there is always a certain amount of fire hazard around an oil company.

Q. I am only talking about your shore installation? A. Yes. 10

Q. If you have any spillage of oil, you might get a fire around your installation? A. Very very little chance, from any local spillage.

Q. The chance may be small, but if the chance comes off it is a very serious matter, is not it? A. It would be.

Q. And you have fire precautions to prevent any fire in the event of any spillage or leakage? A. I am just trying to think - yes. Of course, there are other things to be considered. 20

Q. I appreciate that, but you have these detailed and extensive fire precautions being observed all the time there? A. Yes.

Q. And one of the reasons for those fire precautions is that if oil is spilt and if caught alight, it would be very serious? A. It all depends what you mean by "oil".

Q. We will come to that, but that is why you have them? A. Yes. 30

Q. You are not suggesting, are you, that if furnace oil was set alight it would not burn? A. It would have to be set alight.

Q. But if it was set alight, it would burn? You know that, don't you? A. Yes. It would sustain a fire.

Q. And if it were set alight, if spilt around your installation at Ballast Point, you could have a serious fire, could not you? A. It all depends on the spillage. There is a certain amount of spillage in our compound for a start. But we guard against that, either pick it up - but most times it is left there and it disperses itself. 40

Q. You mean it all depends how big is the spillage? A. No, not at all.

- | | | |
|----|--|---|
| | Q. Has not the size of the spillage anything to do with it? A. No, nor the quality of the oil that is spilt. | Defendants
<u>Evidence</u> |
| | Q. Does the quantity come into it at all? A. No. | No.33 |
| | Q. That applies with any oil, does it? A. Not any oil. You are talking about oil. There are refined oils - petrols, kerosene and automotive distillate - and then there is your black oil. | H.J.MacAnalley
21st February
1963 |
| | Q. Does not the quantity spilled have anything to do with it? A. No. | Cross-
Examination
continued. |
| 10 | Q. Nothing at all. So you would be just as happy about a kerosene tin full of kerosene being spilt, as against 1,000 gallons? A. It is just as dangerous. | |
| | Q. You are quite serious about that? A. Yes, I am. | |
| | Q. However, you realize that if bunker oil was spilt at your depot, either on the installation or on the wharf, and it was set alight, there would be a danger? A. If you could set it alight. | |
| 20 | Q. I mean bunker oil lying around on the ground or on concrete or on wood, if set alight at your installation. A. I have never seen it. | |
| | Q. I know you have not, but you would agree with me that if it is lying around and if it is set alight - A. If. | |
| | Q. If it is set alight, there would be a danger at your installation in those circumstances, would there not? A. Yes, if it was set alight. | |
| | Q. You have not, I take it, seen oil burn on water? A. I have never seen it. | |
| | Q. If oil was set alight at your installation, lying around on the ground part - do you follow me? A. Yes. | |
| 30 | Q. You can also see that if it was put around slipways, foreshores and piles, if set alight, you could also have a fire? A. If you could set it alight. It is a big "if". | |
| | Q. You, of course, had never attempted to set furnace oil alight, had you? A. Yes. | |
| | Q. When? A. After the fire. | |
| | Q. This is when you had your experiment with the slag dropping through the oil? A. Yes. | |
| 40 | Q. But you had not, apart from that test, ever set it alight? A. No. | |
| | Q. You had been for 28 years in this place? A. Pretty well. | |
| | Q. And you had never seen a spillage from a ship at your wharf, anything like this, had you? A. No. | |

Defendants
Evidence

No.33

H.J.MacAnalley

21st February
1963

Cross-
Examination
continued.

Q. And you had, therefore, no experience of a spillage of oil from a ship, on water, of that size? A. I had not had any direct experience, but you learn from other people's mistakes, don't you?

Q. Yes. A. Other people have had spillages in the Harbour.

Q. And you have never had anything like this from Ballast Point? A. No.

Q. Did you have any qualifications or course or test, in the early part of your life? Did you do any technical training? A. Only heat engines. 10

Q. Have you ever had any experience of welding or of oxy cutting? A. No.

Q. None at all? A. Not actually doing it myself.

Q. You just know of it? A. Yes.

Q. You have never tested or watched any molten bits of slag or metal coming from any oxy-welder; as to how they can light up some combustible material? A. I have had plenty of experience, because I have had welders working for me. 20

Q. Well, you would know that molten slag and metal can light up combustible material? A. It can, combustible material, yes.

Q. And if the combustible material lights, because of that you get a flame, don't you? A. Yes, but it might smoulder. 30

Q. It might smoulder and it might flame? A. It might. It all depends on the material.

Q. Have you ever seen a flame on furnace oil? A. No.

Q. It would be fair to say that you, in 1951, did not know how furnace oil would or would not burn, if lighted? You did not know, did you? A. Of course I knew.

Q. But before 1951 you had never tried to light it? A. I had never tried to light it, no; but we know the properties of it. 40

Q. You knew it would burn, if it was lit, in 1951? A. I know very well it will burn, but you have to pre-heat it to burn it.

Q. Did you or did you not know, in 1951, that if it was lighted it would burn? A. Anything will burn if you light it.

Q. You did not know the flash point of this particular oil, did you? A. Not this one, no.

Defendants
Evidence

Q. And you did not ask about it? A. It did not have anything to do with me.

No.33

Q. You came into the picture when Mr. Durack asked your opinion? A. Yes.

H.J.MacAnalley

Q. And your functions at Ballast Point were as shipping foreman? A. Yes.

21st February
1963

10 Q. And to see that the cargo was properly discharged?
A. That is right.

Cross-
Examination
continued.

Q. To check them? A. Yes.

MR. ASH: Q. Do you know of the Standards Association of Australia? Never heard of it have you? A. No never heard of it.

Q. You do not know what they do? A. I haven't got the faintest idea.

Q. As regards fire precautions you were only concerned with your own? A. That is all.

20 Q. Have you ever cleaned out tanks with furnace oil in them? A. Yes.

Q. Do you take precautions there? A. Not the precautions

Q. For petrol? Do you take any precautions for furnace oil when you are cleaning out different tanks? A. No.

Q. You do not? A. No, no precautions.

Q. You do not get any test made of the air and fumes in it? A. No.

Q. You have never done that? A. No.

30 Q. Do you use any steam on it? A. Not when we clean it; the only time we might use steam would be to drive a pump to take the oil out of the bottom and put it in the containers.

Q. You just send a man in there to clean the tank?

A. Not at that particular time - after the tank is aired.

Q. Why do you air it? A. Just in case there are any fumes about.

Q. What are you worried about? A. I am not worried about anything.

Q. Why do you air it? A. You have to air it to get light into it to see what you are doing.

40 Q. You said to see if there were any fumes in it? A. I didn't say that at all. Just in case there were any fumes at all, that is all.

Q. What would be the point if there were no fumes about?
A. No furnace oil?

Defendants
Evidence

No.33

H.J.MacAnalley

21st February
1963

Cross-
Examination
continued.

Q. That is what I said? A. You never get fumes.

Q. You would not be worried about any fumes in a furnace oil tank at all? A. No.

Q. Never? A. No.

Q. You would not take any precautions at all there-
for to clean any fumes out? A. No, barring the
fact you lift the expansion heads and open the
tops to get light into it.

Q. Then you get light into it? A. Yes.

Q. Any other reason? A. You might want a bit of
fresh air in there. 10

Q. Why would you want fresh air in there? A. You
would not want to be breathing the same air all
the time you were in there.

Q. It is only in relation to men breathing?
A. And light.

Q. So that they can see? A. Yes.

Q. No other reason. A. Not that I know of.

Q. You have never heard that after the lid is
taken off a tank containing furnace oil there
might be some fumes in there? You never heard
that? A. No. 20

Q. In your 28 years' experience? A. Yes.

Q. Well, I take it you have never heard of it?
A. No.

Q. You had never heard that the fumes might be
capable of being lit? A. No, never.

Q. And as far as you are concerned the taking
the lid off is just to get light to work and to
save the men the dirty smell? A. Yes. 30

Q. You do not want to alter that answer in any
way? A. I just say at that particular period
you do not go in the tank.

Q. At what period? A. When you first take the
tops off.

Q. You told me because you want the fumes to get
away. Is that right, so that the fumes will get
away and the men cannot smell them? A. I have
been cleaning tanks out for years and I have
never struck fumes in a tank yet that inconven-
ienced me. 40

Q. That inconvenienced you. A. Yes.

Q. I thought you said that you wanted the place to air so that the smell would go down. Is that right or wrong? A. Yes, that is all right.

Q. Is it right? A. Yes.

Q. And the only other reason for taking the lid off is to get the light to work by? A. Yes, later on.

Q. Do you leave the lid off for any time before you send the man in.

10 A. The lid might be off for days before the man goes in.

Cross-
Examination
continued.

Q. Why? A. Because you are pumping the bottom out of it; you just do not go in and sweep it up in the handful and take it out.

Q. You pump the oil out of the bottom? A. The oil might be that thick in the bottom.

Q. You cannot do that with the lid on. A. Yes, you can.

Q. Well, why don't you? A. It is easier to see what you are taking your hose to and getting to the pools.

20 Q. How long are the lids left off these tanks before the cleaning starts? A. Any time. It all depends how urgent the job is.

Q. How short would be the time? What would be the shortest time? A. Two or three days.

Q. Two or three days would be the shortest before you send men into a tank containing furnace oil when the lid has been taken off? A. Yes, he may go in the same day as the lid was taken off.

30 Q. How do you make up your mind whether he can or cannot? A. He might have to.

Q. He might have to? A. Yes, to shift the hose about to get the remainder of the oil out of the tank, the oil and the slush.

Q. You would not do that unless it was absolutely necessary would you? A. Yes, if it is necessary to shift it out and we want to get the job done, we would get in and do it.

40 Q. Because it had to be shifted out? Why do you normally leave it off two or three days? A. You do not normally leave it off two or three days. I said you might take it off and it might take you a week to pump the bottom out because in these tanks there were no steam coils in them, so all the slush that collects in the bottom is all shifted and it takes some shifting at times.

Defendants
Evidence

No.33

H.J.MacAnalley

21st February
1963

Cross-
Examination
continued.

Q. Would you agree with me that oil vapour - and I am speaking of oil including furnace oil, so that there is no mistake. Do you follow? A. Yes.

Q. - that oil vapour is explosive when mixed with air? A. Yes.

Q. You would agree? A. Yes, I would agree with that.

Q. And, being heavier than air, accumulates at low levels in confined spaces? A. That is right.

Q. So you do get vapours from furnace oil in a tank? (Objected to).

10

HIS HONOUR: I think you had better delete the word "so".

MR.ASH: Q. Do you still say that you cannot get vapours or fumes from furnace oil in a tank?

A. I did not say you cannot get it. I said I have never known it to happen.

Q. But you would agree with this statement? A. I do not know whether it is an authoritative statement.

20

Q. Do you agree that oil is explosive when mixed with air, and accumulates in confined spaces at low levels? A. That is right, excepting furnace oil, because in all my experience with furnace oil I have never been worried with it.

Q. You would not agree with that in connection with furnace oil? A. Not in my experience.

Q. That is 28 years? A. Yes.

Q. Would you agree with this, that with furnace oil it is always present - that is the vapour - in a partly filled oil tank and is discharged from the vent of the tank being filled? The vapour is discharged from the vent of the tank being filled? A. If there is any vapour there, Yes, it would have to be discharged through the vents when you are filling it.

30

Q. To be quite fair to you I want to tell you that I am reading from a book which is a set of rules applying to the design, construction, operation and maintenance of installations for the storage and application of oil fuel having a flashpoint not less than 150 - over 150. A. Not less than 150?

40

Q. That means over 150. It could be 150. I am talking about that type of oil and I want you to say whether you agree with one or two more statements. You disagree with the statement I have read out in relation to furnace oil? A. No. I am saying not in my experience.

Defendants
Evidence

No.33

H.J.MacAnalle,

21st February
1963

Cross-
Examination
continued.

Q. Whether you have in fact experienced it, do you claim enough knowledge, apart from your own personal experience, to be able to talk about how inflammable or not is the vapour from furnace oil? A. No, I haven't got the knowledge.

Q. You are absolutely unable to express an opinion on it? A. No, I would not express an opinion on it.

Q. You realise, don't you that when any oil burns it is the vapour, that catches fire and not the oil itself? You realise that? A. That is right, Yes.

Q. So that when you give an opinion on the fire risk of furnace oil it follows that you are thinking of the fire risk of the vapours of fuel oil, of furnace oil, aren't you? A. Well, Yes.

Q. So that you now say that you are quite unable, by reason of your knowledge and experience, to speak of whether or not furnace oil is a fire danger, aren't you. A. No I am not.

Q. You are not? A. No. You are talking about fumes in the tanks and one thing and another. I have never experienced fumes in the tanks. All the tanks that I have cleaned out that contained furnace oil have been quite O.K. to go into; there have been no fumes and very little smell.

Q. You would not know, when you have gone into these tanks whether there was any vapour present or not would you? A. Not unless you could smell it. It would depend on your nose.

Q. Never mind your nose. From your knowledge, you just do not know whether there would be any vapours there or not, do you? A. It might be there in a very small concentration.

Q. Why do you say that. A. I said "maybe".

Q. Aren't you guessing? You don't know, do you? A. What?

Q. Whether these vapours are present or not? A. You may not know; you may not be able to pick them up unless you went to a lot of tests.

Q. I am putting it to you that you do not know whether there are vapours there or not? A. Well the only thing is - put it that way, I suppose you are right.

Q. I am asking you. Isn't that a fair way of putting it? You really do not know whether there are oil vapours there on top of furnace oil or not, do you? A. No, I do not. That is in a confined space.

Q. In any space? A. Oh, No.

Defendants
Evidence

No.33

H.J.MacAnalley

21st February
1963

Cross-
Examination
continued.

Q. You said you do not know whether it is in a confined space. What do you say about more open spaces? A. The more open the space it would be dispersed quick and lively.

Q. What would be dispersed? A. The so-called fumes you are talking about.

Q. You do not know whether they are there or not to be dispersed, do you -

MR. HOLLAND: That is a matter of argument on the hypothesis. 10

MR. ASH: Q. If you do not know whether there are any vapours on the oil - and you do not, do you? A. It is only natural that they would come off sometime.

Q. What makes you say that? A. There are more factors to come into it, such as temperatures.

Q. Go on? A. That is the biggest factor.

Q. Do you know whether vapours will come off furnace oil at all anywhere? A. No, I just could not tell you. 20

Q. You cannot tell me? Well that is fair enough; I am not blaming you, and if you do not know today I take it you have never known. That is right isn't it? A. I suppose so.

Q. If you do not know if the vapours come off furnace oil anywhere and any place, then you do not know whether furnace oil is likely to catch fire or not, do you? A. Oh, Yes, I do. It is hard to set furnace oil alight.

Q. You do not know whether it would or would not, because I am putting to you - you will agree with me, and there is no catch to that, it is the vapours that catch fire and not the oil? A. Yes. 30

Q. You agree with that? A. Yes.

Q. But if you do not know if any vapours come off a thing or not you do not know whether it is going to catch fire or not, and in what circumstances? A. The temperature has a lot to do with it.

Q. Why do you think the temperature has a lot to do with it? A. Because any petroleum products at all the temperature affects them. 40

Q. You do not know whether there are any vapours there at any particular temperature or group of temperatures, do you. You do not know? A. No, I don't know.

Q. All I am putting to you, and I will stop worrying you if you will tell me if you don't know whether the vapours are there or not, you do not know how likely or unlikely it is that that oil will catch fire? You don't know do you? A. I have a fair idea; it would depend on the circumstances.

Defendants
Evidence

No.33

H.J.MacAnalley

Q. I suppose some circumstances would be whether there was anything to light it? A. That is one.

21st February
1963

Q. But you have also got to have something to catch fire, haven't you? A. Yes.

Cross-
Examination
continued.

Q. And we have agreed if the oil is going to catch fire it would be the vapour? A. Yes.

Q. And you do not know how much vapour is on any body of fuel oil, do you? A. I could not tell you.

Q. And if you cannot tell me whether there is any vapour there, or how much, is there, you would not know at any lot of furnace oil whether it was going to catch fire or not would you? A. I haven't got a chemist's knowledge.

Q. You haven't got sufficient knowledge have you. A. I haven't got the chemical knowledge.

Q. It may be chemical knowledge, or some other knowledge, but at any rate you haven't got sufficient knowledge to give an opinion on it? A. I would give an opinion at any time.

Q. Whether you have any knowledge or not? A. I would give an opinion.

Q. Whether you had the knowledge for it or not? A. Yes, I could give an opinion.

Q. Do you agree with this, that ignition of oil fuel vapour can be caused by an electric spark, smoking, spark caused by striking metal, the filament of a broken electric lamp, sparks from a chimney and fires under boilers? Would you know that? A. That is the cause of any fire.

Q. You can set alight to oil vapour by any of those things. Do you know that? A. Yes.

Q. You do? What vapours? A. Any of the refined oils will spark like that.

Q. I am putting this to you in connection with furnace oil? A. I do not think furnace oil will ignite with a spark or anything else: (Objected to).

Q. If there are any vapours would you agree that they can be ignited by those things? A. Any vapours in sufficient concentration, Yes.

Defendants
Evidence

No.33

H.J.MacAnalley

21st February
1963

Cross-
Examination
continued.

Q. What vapours would be in any concentration over furnace oil at any particular time? You just don't know because you haven't got the knowledge have you? A. I don't know of any particular concentration but I have a fair idea when it is safe.

Q. Although you do not know what vapours are there. A. Yes.

Q. You still say you have a fair idea. A. Yes.

Q. You have never seen fuel oil burning before this accident? A. Only burning under boilers. I have seen it spilled in the water in Sydney Harbour.

10

Q. You have seen it spilt but you haven't seen it alight? A. No, I have not seen it alight.

Q. You have never seen it spilt in such quantities as this in Sydney Harbour? A. More.

Q. Did you just say the word "more"? A. Yes, In a larger quantity.

Q. You have seen a larger quantity than this? A. Yes.

20

Q. Where? A. From Gore Bay.

Q. When? A. I don't know when it was, but it came down right across the Harbour there and got right under the bridge.

Q. Was it alight? A. No.

Q. You hadn't seen any of it catch fire up to this time, had you, and apart from seeing fuel oil burn under the boilers you have never seen it burn at all? A. No.

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Q. You gave evidence in this case five years ago. Do you remember? A. Yes, I remember it.

Q. You would agree with me that what you said was true? A. As far as I know.

Q. To the best of your ability? A. Within my knowledge.

Q. That is your recollection at that time? A. Yes.

Q. You remember you said that you saw this oil - when you first saw this oil it was trickling down the side of the ship? A. Yes, the side of the ship.

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Q. And later on, when it became daylight, you saw further oil on the water? A. Yes.

Q. Would you agree that as regards the "Wagon Mound" when you first saw it, that the oil was a trickle, it was running. It may have been like that for hours when you first saw it. Do you remember that? - "It may have been like that for hours"? A. It may have been.

Defendants
Evidence
No.33
H.J.MacAnalley

Q. You were asked: "There was oil lying between the ship and the wharf" And you said "It was lying under the wharf". A. Yes.

21st February
1963

Q. And do you further remember this: "The bulk of it went down into Mort's Bay along under Mort's Wharf"?
A. That is right.

Cross-
Examination
continued.

Q. And "It worked its way around to Snail's Bay"?
A. Yes. That wasn't the same day.

Q. Not the same day? A. Oh, No.

Q. But it did work its way around there? A. Yes, it worked around slowly into Snail's Bay.

Q. I put it to you that you have forgotten your position about going on to Sheerlegs wharf. I am putting to you that you did not go on to Sheerlegs wharf prior to the fire? A. We did.

Q. Do you remember being asked this: I will lead up to it: "Were you at any time, on the afternoon of the 30th"- and I should tell you that was a Tuesday - "on the Sheerlegs wharf" and you said, "No, I don't think so; I don't think we went on to the wharf". Do you remember saying that? A. I don't remember saying that.

Q. If you said that then, five years ago, it was probably right, wasn't it? A. Yes, it may have been. It is pretty hazy trying to remember back all the time.

Q. But you would have a better chance of remembering in 1958 than in 1963 wouldn't you? A. Yes.

Q. You remember you said you went around there only once before the fire to have a look? Once around the Mort's Dock area? A. I only ever went to the Mort's Dock area once.

Q. You only went once in those three days before the fire? A. After the fire - I am sorry, before the fire.

Q. "And at no time were you with Mr. Parkin on the Sheerlegs wharf? - No, I don't think we went near the wharf". Do you remember saying that? A. I don't remember saying that.

Q. Would it be true? A. I cannot tell you.

Q. You don't know? A. I cannot remember that far.

Q. You don't know whether you went near the wharf or not? A. I cannot tell that far back, but I know this much, I had a look at the other wharf.

Q. I am talking about the Sheerlegs wharf? A. Yes.

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Defendants
Evidence

No.33

H.J.MacAnalley

21st February
1963

Cross-examination
continued.

RE-EXAMINATION

Re-examination

Q. And I am putting to you that at no time did you and Mr. Parkin go near the wharf? A. I don't know, I could not remember.

MR. HOLLAND: Q. You just said you looked at the other end of the wharf? A. Yes.

Q. When was that? A. After we came back.

Q. Who is "we"? A. Mr. Durack and I.

HIS HONOUR: "Came back" means the Yeend Street end? A. By the Yeend St. Wharf end. 10

MR. HOLLAND: Q. You looked at that after you came back with Mr. Durack from where? A. From Mort's Dock.

Q. My learned friend put to you some extracts from a book of the Standards Association about leaving the tops off tanks. Do you recall that? A.Yes.

Q. To enable the vapours to get away. Do you recall that? A. Yes.

MR. ASH: I think the actual extracts I put were connected with the properties of oil vapour and its ignitability. Just prior to that I had examined him about the top coming off the tank, but not in relation to this extract. 20

MR. HOLLAND: Q. At all events he asked you about the practice of taking the tops off oil tanks? A.Yes.

Q. And he put some matter to you about the ignition of oil vapours, and ultimately he persuaded you to say that you don't know whether there would be vapours in confined spaces or not. Do you remember that? A. Yes. 30

Q. I want you to tell me, in your experience have you ever experienced anything to suggest the presence of vapours from bunker fuel oil? A. Would you repeat that?

Q. In your experience have you ever observed, or noticed, anything to suggest the presence of vapours from bunker fuel oil in a tank? A. No.

Q. Or out of a tank? A. No.

Q. In the course of your contact with bunker oil, and 40 in the discussions with other people in Caltex concerning bunker oil, have you ever learned anything or heard anything to suggest the presence of such vapours from this kind of oil in or out of a tank? A. No.

Q. So far as products other than fuel oil are concerned, apart from conducting any special kind of test, is it possible to detect the presence of vapours? A. Ycs.

Defendants
Evidence

No.33

Q. How? A. You can smell it for a start, and you know they are there.

H.J.MacAnalle

Q. What effect does it have on you if you can smell it? A. It is dangerous.

21st February
1963

Q. Is it pleasant or unpleasant? A. Most unpleasant.

10 Q. You were asked also about what concern you would have about fire danger in relation to the size of a spillage, and you said that if there was a small spillage of refined oil, such as kerosene, you gave us an example you would be just as much concerned as if it was a large spillage? A. Yes.

Re-
Examination
continued

Q. Could you explain that? A. The small spillage of kerosene is inflammable and it would be just as dangerous to other portions of plant, even a small spillage.

20 Q. Right at the beginning of your cross-examination you were asked whether you saw the "Corrimal" alight, and you said you did from your office. I want you to tell the Court what part of the "Corrimal" you could see from your office? A. Just part of it; flames were coming up.

Q. What part of it was visible? A. Just the upper works.

Q. The upper works? A. About the upper works.

Q. Could you see any part of the hull? A. No, I don't think so. I could not say at this juncture.

30 HIS HONOUR: Q. I suppose all you could see was some smoke and some flame? A. It would be flame and smoke.

Q. You would not be seeing any particular part of the ship itself would you? A. No, you could see the upper works of it, say the masts and funnel.

MR. HOLLAND: Q. Before the fire occurred had you noticed the "Corrimal" there? A. She had been there for some time.

Q. So, before the fire, you could still only see the upper part of the works or more? A. Yes, that is all from where we were situated.

(Witness retired)

Evidence of G.W. Newton

GEOFFREY WILLIAM NEWTON

Sworn, examined as under:

Defendant's
Evidence

—————
No.34

G.W.Newton

21st February
1963

Examination

MR. MEARES: Q. What is your full name? A. Geoffrey William Newton.

Q. Where do you reside? A. 63, Benboyd Road, Neutral Bay.

Q. I think, Captain Newton, you have served in a large number of ships of all types, from 1935 up to 1954? A. Yes, 1954. 10

Q. From 1935 to 1939 you were with the Anglo Iranian Oil Company in oil tankers operated by the British Tanker Company, which is the fleet division of the Anglo Iranian Oil Co. A. That is correct.

Q. In this occupation you sailed over most of the world in tankers as a cadet deck officer, and later as 2nd, 3rd and chief officer? A. That is correct.

Q. Between 1939 and 1941 you were a 3rd officer in the same company's tankers? A. That is correct.

Q. And between 1941 and 1945 the Royal Navy took over certain tank ships and you served in tank ships during that war period as second officer. A. Yes. Second officer, but temporary commission as Lieutenant in the Royal Naval Reserve. 20

Q. After the war you remained in tankers until 1946 with the rank of 2nd and chief officer, and in 1946 you joined the Union Steamship Company of New Zealand, and you served with that company on their ships until 1954 on cargo vessels? A. Yes. 30

Q. And those cargo vessels that you served on were fuel oil burners? A. Fuel oil and diesel.

Q. I think for the last two years you have been the Assistant Federal Superintendent of a Commonwealth-wide organisation dealing with accident prevention related to ships? A. Yes.

Q. As far as your experience has been on the ships you have served in, is the responsibility of loading the fuel oil the primary responsibility of the chief officer or not? A. Responsible directly to the master for the loading and discharging of the fuel. 40

HIS HONOUR: Q. The Chief Officer? A. Yes.

MR. MEARES: Q. Is there any difference, in your experience, if you are loading on to a tanker lighter oil, such as benzine, motor spirit, or kerosene, with the system of loading it when compared with furnace oil. A. Yes, there is a difference.

Defendants
Evidence

No.34

G.W.Newton

21st February
1963

Examination
continued.

10 Q. What is that difference? A. The primary difference is that the compartments of the oil tanker, when loading spirit or light oils, are closed down, hermetically sealed. The ventilating system from each tank compartment at the mast is opened, and when loading black oil it is not the practice or, in fact I have not seen it, where all the compartments are opened, the lids of the compartments are opened. The lids of the compartments are opened whilst the black oil is being loaded into the vessel.

Q. I think you have seen me and junior counsel and a solicitor in my chambers? A. Yes.

Q. You have not been told, have you, the probable cause of the fire that occurred at Mort's Dock. A. No, I have not.

20 Q. But you have known, I think, for some time have you not, of this oil fire at Mort's Dock at the Sheerlegs wharf? A. Not for too long.

Q. And you know that this oil fire damaged the wharf and the "Corrimal" alongside it? A. I do know that.

Q. In your experience in ships have you ever seen a fuel oil fire on water? A. Not at any time except during the war.

30 Q. And on what occasion and under what circumstances did you see it during the war? A. An oil tanker proceeding independently and not in convoy, with a torpedo explosion - in fact more than one torpedo on this occasion.

Q. Was the oil tanker only carrying fuel oil or anything else? A. I understand that she had a compartment of light spirit as well as fuel oil.

Q. And did you see the fuel oil alight, or did you see the waters alight following on that torpedo explosion? A. Yes.

40 Q. Were you one of the convoy? A. We were one of the escorting vessels.

Q. You know the meaning of the expression "flashpoint" and its significance? A. Yes.

Q. Are you generally aware of the usual flashpoint of fuel oil? A. To the best of my knowledge I think I am correct in saying it is 150 degrees and above, Fahrenheit.

Q. And you have seen it of course on many occasions? A. Yes.

Defendants
Evidence

No. 34

G.W. Newton

21st February
1963

Examination
continued.

Q. I want you to assume that there was a very substantial spillage of fuel oil that had a closed cup flashpoint of 170 degrees Fahrenheit at Ballast Point. I think you are aware of Ballast Point? A. Yes.

Q. And I want you to assume that oil flowed away from Ballast Point and spread very substantially in the Harbour towards Goat Island, and very substantially around the Mort's Bay area.

Endeavouring as best you can not to be wise after an event, would you or would you not, taking yourself as the agent who spilled the oil, or person responsible, have been concerned with such a spillage, under those circumstances that I have described, as a fire hazard? A. In my opinion, No, that would not be my main concern.

Q. When you say it would not have been your main concern, would it have concerned you? A. As regards fire?

Q. Yes? A. Well, in very extenuating circumstances, Yes.

Q. Can you imagine, in 1951, any risk of this oil catching alight under the circumstances I have stipulated? A. Not in just the circumstances you have described.

Q. I want to put you in the position of the skipper and you have spilled oil? A. Yes.

Q. And you said you would not have been mainly worried about the fire risk, and you said not in the circumstances, but if you had been sitting in your cabin or wherever you come to sit, would you have given the question of fire danger any thought, or would you have dismissed it from your mind, or what? A. I don't think fire danger would have occupied my mind, I would have had another reason to be worried about the spillage which I think would have excluded any thought of fire.

Q. And what would have been your worry? A. Pollution of navigable waters.

Q. Supposing somebody had said to you "forget about pollution for the moment" and as far as fire danger is concerned, can you imagine any circumstances under which this would be set alight, what circumstances, doing as best you can in this Year of Grace, would have come to your mind? A. In my opinion there would only be two circumstances that I can think of, either an independent explosion somewhere in the vicinity or a large fire that had somehow started independently, such as a wharf or building.

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Q. Have you been on ships that have spilt oil? A. Yes.

Defendants
Evidence

Q. And have you seen oil on waters in which tankers are in various parts of the world? A. Yes, I have.

No.34

Q. Can you think of any particular ports? A. Abadan in the Persian Gulf; Aruba in the Dutch West Indies. I am afraid I am looking back rather a long way now to think of any instances, but probably it may have been in Balikpapan in the East Indies.

G.W.Newton

21st February
1963

Q. Was this when you were on tankers? A. Yes.

Examination
continued.

10 Q. Were you, in those cases, concerned with any fire risk hazard? A. No, Sir, we were not.

HIS HONOUR: Q. Did these incidents occur when you were at a wharf in a harbour? A. No.

Q. How were you situated? A. We were alongside the oil installation jetties loading the oil.

20 Q. But in a sizable bay? A. Abadan is in a river 40 miles from the open sea; the width of the river, I suppose, would be about a quarter of a mile from bank to bank and in Aruba it is a sheltered harbour, an artificial harbour with virtually no tidal action.

MR. MEARES: Q. As far as oil is concerned you are aware of its flashpoint and if it were on water, in your opinion would the water have any effect or not? A. I am sorry?

Q. Would the fact of it being on water have any effect on its likelihood of its catching alight? A. I think it would be lessened in my opinion.

Q. I think there are some oils, are there not, which give off very marked vapours? A. Yes.

30 Q. And I think you are aware, are you not, that those vapours can be dangerous? A. Yes.

Q. Are they vapours that you can detect, Captain Newton? A. Yes.

Q. By what means? A. Principally by smell.

Q. As far as the fuel oil is concerned, what does your experience suggest in relation to any strong fuel oil vapours? A. Well, I have never regarded it as an inflammable vapour in the sense of the other lighter oils.

40 HIS HONOUR: Q. But have you been able to detect, by the ordinary use of senses, the presence of vapour of that sort above fuel oil? A. Yes, from fuel oil you can detect it be sense of smell.

MR. MEARES: Q. Fuel oil has got a typical smell, has it not? A. Yes.

Defendants
Evidence

No.34

G.W.Newton

21st February
 1963

Examination
 continued.

Q. But as far as any vapour smells are concerned are they in the same degree, if it is not heated up, as vapours from the lighter fluids? A. No.

Q. I want to ask you this from your experience. In the event of a spillage of oil in a harbour what action in your experience is taken?

A. My immediate duty as master -

MR. MEARES: I do not think you can tell me your duty.

HIS HONOUR: Q. What has been your experience? 10

A. The Harbour authorities of the port in which the vessel was lying were informed immediately or as soon as possible after the accident.

MR. MEARES: Q. Notification having been given, as far as any action is concerned, from your experience in harbours has it been your experience that you are entitled to do anything on the harbours then or not. (Objected to).

MR. MEARES: I do not see how I can put it any other way without suggesting an answer. I will withdraw the question. 20

Q. You notify the Harbour Master as soon as possible? A. Yes.

Q. Is there any other action, from your experience available to you or the ship? A. No, I do not think there is.

HIS HONOUR: Q. Have you seen anything done either to prevent the spread of oil which has been spilled or to pick it up again, remove it from where it is? A. Yes, I have seen that done. 30

Q. What sort of thing have you seen done? A. This was not done by any ship's crew of course; this was performed by the harbour authorities in the nature of a floating boom in sections, which was drawn around the area of pollution.

Q. Where did you see that? A. I have seen that done in Sydney Harbour.

Q. Approximately at what time? What year? A. It must have been quite some time ago when the Admiralty Oil Jetty was in existence at Kurraba Point, and the oil line from the jetty ran around the foreshores to Neutral Bay. I would think it is at least ten years ago. 40

MR. MEARES: Q. What sort of oil was it from what you heard? A. I believe it was fuel oil.

HIS HONOUR: Q. Is there anything else you have seen done? A. No I have not been close enough to observe anything else.

Defendants
Evidence

MR. MEARES: From your knowledge of fuel oil would you have thought, in 1951, that anything in the way of paper or hessian or matches or sparks alight from welding or burning and falling on to the water with the oil on it could have lit it up? A. No, I would not have considered it was possible.

No.34

G.W.Newton

21st February
1963

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(Luncheon Adjournment) Examination continued.

At 2 p.m.

MR. MEARES: Q. You were relating, I think, some comparisons between bunkering and discharging fuel oil and other oils. Was there anything you wished to add?

A. There may be one point which may be of interest to the Court. In the case of preparing to load spirit cargoes, such as kerosene, benzine etc., the galley fires, which in the majority of ships at the time I am speaking of, when I was serving, were either oil fuel stoves or coal stoves - all coal fires and other fires such as furnace fires had to be extinguished before loading commenced.

Q. This is on a tanker? A. This is on the vessel. All meals in other words were prepared ashore and brought on board the vessel and such fires were nor relighted again until the vessel was virtually ready for sea, and loading or discharging operations had ceased. In the case of fuel oil, furnace oil cargoes, it was not the practice; it was never necessary to extinguish galley fires and so forth.

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CROSS-EXAMINATION

Cross
Examination

MR. ASH: Q. If I can take you back to 1951, you remember Mr. Meares asked you some questions about your views then, and he put these facts of this substantial spillage of furnace oil, and you have said that primarily you would direct your mind to pollution. I think in the realm of the fire risk what you said was that there would be a fire risk, in your view, in two circumstances; if there was an independent explosion or a large fire such as a wharf fire started independently? A. Yes.

Q. Take the second of those. What you mean by that is, I take it, that if a large fire started independently and came into contact with the oil, then you would expect a real danger? A. There would be some danger.

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Defendants
Evidence

No.34

G.W.Newton

21st February
 1963

Cross-
 Examination
 continued.

Q. And if a fire did come into contact with oil and spread along the oil, then it could cause extensive damage? A. If the oil on the water was in the vicinity -

Q. Yes, I am sorry. I postulate a ship tied up to the wharf and the oil on the water lying underneath the wharf and up to the ship, and in and about the piles and foreshores. So what you mean is if the fire, having started independently, came into contact with oil such as that it could lead to extensive damage? A. It could add to the extent of the fire.

10

Q. And could damage of course the ship in those circumstances? A. Yes, it would have to be rather a large one.

Q. What I mean is, the point about it is you cannot give every possible situation, but speaking generally - say the oil was under the wharf for the whole of its 600 foot odd and the ship was about 250 feet, that type of situation where you have the oil right under the wharf, out to the ship and piles and foreshores. What I put to you is if a fire started and it did come into contact with the oil, then it is obvious that there could be a big extension of the fire and extensive damage to the ship? A. Yes, I had not thought of it in 1950 or 1951, but I can see.

29

Q. No. In 1951, you said, that your view was that one of the possibilities was that if a big fire such as a wharf fire started, then you would consider the presence of the oil a fire danger? A. Yes.

30

Q. Then all I am putting to you is that the basis of your saying that it would be a fire danger would be because the presence of the oil would lead to a rapid extension of the fire? A. Yes.

Q. And that such a rapid extension of the fire, if a ship was tied up beside the wharf, could lead to the burning of the ship? A. Yes, that is possible.

Q. Of course when you say "large fire", I suppose what you really mean is any fire of sufficient size to affect the oil in the sense of setting it alight? A. I am sorry.

40

Q. You mentioned the fire starting independently, such as on a wharf? A. Yes.

Q. What I am putting to you is that by that general idea you have in mind a fire of sufficient size to set the oil alight? A. Yes.

HIS HONOUR: Q. I take it, however, from what you have said, that in 1951 at any rate you would have thought that it would need a pretty sizable fire to do that?
A. Yes.

Defendants
Evidence

No.34

MR. ASH: Q. But you would have also thought in 1951 that whether or not it was a sizable fire, if it was sizable enough to set the oil on fire, that would have been sufficient for your example? A. In order to set a fire on the water, in my opinion it would have had to have been a sizable fire.

G.W.Newton

21st February
1963

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Q. Let us take the example of a fire on the wharf. You would know of course from your maritime experience that although they do not occur every day that wharf fires are known to happen? You know that don't you? A. Yes.

Cross-
Examination
continued.

Q. And that they can be started of course by a number of circumstances on the wharf itself? A. Yes.

Q. And the fact that wharf fires could start would have been present in your mind, not only today in 1963, but during your maritime experience? A. Yes, could start.

20

Q. And could start in a number of ways from a number of causes? A. From a number of causes.

Q. And then too, the second element, you mentioned the possibility of independent explosion, Do you remember that? A. Yes.

Q. As again being a possible cause of setting the oil on fire. That is how you meant it? A. Yes.

30

Q. I suppose you would agree that where industrial operations are carried on, where burning is used, there could, and I put it no higher than that, there could be explosions? A. Could I ask, when you refer to burning, to what did you refer?

Q. Something that would cause an explosion within an industrial operation. It can occur; that is all I am putting to you. A. Yes, it can occur.

40

Q. Dealing with the frequency of oil fires, or the occurrence of them, would you agree with this? Could you accept this as a fair indication - about wharf fires, I am sorry - would you agree that this would give a general indication, that losses in selected pier and wharf fires reported to the N.F.P.A. - that is the National Fire Prevention Association Committee - of piers and wharves have averaged some large number, some 62 million dollars' worth of damage in 1,314 fires over a 55 year period up to July 1945. You could accept that as statistically probable -

MR. MEARES: I must protest unless Mr. Ash says where they have happened. Is this world-wide, or limited to Birmingham? It seemed to me to be a little bit vague.

Defendants
Evidence

No.34

G.W.Newton

21st February
1963

Cross-
Examination
continued.

HIS HONOUR: It is probably not a very useful question for this reason, that I suppose Captain Newton would not be in a position to assent to such a statement as that or to differ from it.

Q. You would not know, would you? A. I would have no knowledge; I would hesitate to reply Yes or No.

MR. ASH: Q. You would have known that quite a number of pier and wharf fires have occurred?

A. Not a large number. I do not think it is an extremely common occurrence but there have been cases both large and small.

10

Q. Getting back to the precautions, you of course on a ship take great precaution against fire all the time, don't you? A. In a tanker, or in all ships?

Q. In all ships? A. Yes.

Q. It is constantly in your mind, the possibility of fire in a ship is it not? A. Yes.

Q. And you pay particular attention to bilges don't you? A. In cargo ships, Yes, In oil tankers it would not apply; they don't have bilges.

20

Q. But in cargo ships, Yes. A. Yes.

Q. And the attention you pay to oil in the bilges there is another facet of the fire precautions?

A. Well, I think the principal worry of oil in the bilges, if I may say so, in my opinion, is that these bilges have to be pumped out periodically. They cannot be or should not be pumped out in the harbour for the reason, not because of fire, but for the reason of polluting the harbour when discharging bilges.

30

Q. I appreciate that, but I am on the ship itself. Let us take it out of the harbour. You would not deny that the matter of oil in bilges is concerned to some extent with fire danger? A. Yes.

HIS HONOUR: Q. Would you say that was universally true, with the statement you made a while ago, that oil tankers do not have bilges? A. I perhaps might clarify it. In the engine room space, which is a very limited space of the oil tanker, there are bilges, but in cargo compartments or right through the vessel otherwise there are no bilges.

40

MR. ASH: Q. The engine room bilges are kept free from oil are they? A. As much as is possible.

Q. Then of course your fire precautions concern fire drill and fire surveys don't they? A. Yes.

Defendants
Evidence

Q. Talking of your war experience in the Royal Naval Reserve, Captain, of course a tanker was invariably placed, if possible, in the centre of a convoy was it not? A. We would have liked that very much.

No.34

G.W.Newton

Q. That was the optimum? A. Yes.

21st February
1963

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Q. Because, by reason of what it carried it was a far greater risk in fact torpedoed? A. Yes, and of course the nature of the cargo was a No. 1 target for the enemy.

Cross-
Examination
continued.

Q. Yes, because of the supply angle. So of course, if fuel oil was being carried on a tanker, even without petrol or one of the lighter fluids, it would still be considered desirable to keep it in the centre of the convoy if possible? A. If Possible.

20

Q. And not only because of the value of its cargo getting to its destination, but also because of what might happen if torpedoed? A. Yes, except of course that ammunition ships and others otherwise had greater priority.

Q. But apart from ammunition ships and others with top priority, tankers were right up on the list.

Q. Even if not carrying one of the lighter fuels it was always a possibility that if torpedoed there was always a possibility of the oil catching fire? A. Yes.

30

Q. And of course if it caught fire you would know, or expect, that it would burn on the water when spread by the water? A. Yes.

MR. MEARES: What would burn, Mr. Ash?

MR. ASH: The fuel oil.

Q. Had you yourself heard of the "Panamanian" and "Edendale" fires? A. "Panamanian"?

Q. The name of a ship, in Freemantle Harbour? A. No.

Q. Or the Edendale? A. No.

40

Q. When entering port, on the bridge the master would always carry a chart of the port being entered? A. Most certainly.

Q. That is basic procedure? A. Yes.

Q. And on such chart would be shown of course the shore line (Objected to).

Defendants
Evidence

No.34

G.W.Newton

21st February
1963

Cross-
Examination
continued.

Q. On charts of harbours in which a ship is entering there would always be found dock installations would there not (Question allowed)?
A. Yes.

Q. You I take it from your experience as a ship's officer would know that at a dock installation ship repairing would be naturally expected; not every moment, but as the regular thing? A. I am sorry. When you said "a dock installation" did you refer to a dry dock installation?

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Q. A dry dock or a ship repair yard, without an actual dry dock? A. I do not know if it would always be charted on the chart as a ship repair berth.

Q. But when you gave your previous answer you meant a dock what? The dock itself? A. I thought you meant a particular berth in Sydney or in any port of the world.

Q. The berths would be shown? A. Yes, by number or by name.

Q. Wouldn't it be normal for a dockyard to be shown? A. A dockyard such as Garden Island Dockyard, Mort's Dock, Woolwich, Yes.

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Q. And you as a ship's officer would know that if there was in fact a dock and repair yard in a bay in a harbour that you would expect ship repairing operations to be regularly carried on there? A. Yes.

Q. And you of course would know that ship repairing operations quite frequently, very frequently, involve welding and oxy-cutting work? A. I would know as a ship's officer that is carried on?

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Q. Yes? A. Yes.

Q. And you would know from your knowledge that welding and oxy-cutting operations involve the spreading of molten metal particles and sparks and slag? A. In oxy-welding?

Q. Yes, in oxy and electric welding? A. Yes.

Q. And you know with that sort of thing the sparks and slag and molten metal would be quite capable of lighting any combustible material?
A. I think it depends on what you mean by - "readily" combustible material?

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Q. Yes, readily combustible material? A. Yes.

Q. You referred in your evidence earlier to the Chief Officer. Do you recall that? A. Yes.

- Q. Do you have engineer officers? A. Yes.
- Q. On tankers? A. Yes.
- Q. The chief engineer officer is concerned with bunkering isn't he? A. He is, Yes.
- Q. And he would be the one to direct his mind to a number of aspects of it, wouldn't he, when bunkering is taking place? A. Could I have that again?
- 10 Q. The chief engineer would be the officer to direct his mind to a number of aspects of the bunkering operations? A. Yes.
- Q. Both of those officers of course have their responsibilities through the master - the chief officer and the chief engineer? A. Yes.
- Q. Have you ever known a tanker without a chief officer? A. Without a chief officer?
- Q. Yes? A. No.
- Q. Are the chief officer and chief engineer ever the same man on a tanker? A. Definitely not.
- 20 Q. The chief officer has some aspects of bunkering to direct his mind to, has he? A. Yes.
- Q. And within the scope of which each has to direct his mind to they are each responsible under the master? A. Yes.
- Q. The amount of fuel oil to be taken on would be known to the chief engineer I suppose? A. Yes.
- Q. And how much was to be ordered and how much the tanks could hold -
- MR. MEARES: I do not dispute this.
- 30 HIS HONOUR: This witness did say something about it being the primary responsibility of the chief officer, if I understood him correctly - the loading of oil.
- WITNESS: When I was talking about oil tankers, the loading and discharging of the oil cargo I was not thinking particularly of -
- HIS HONOUR: Q. Not thinking of taking on this fuel? A. Bunkering and so forth.
- MR. ASH. Q. As regards the position after spillage has occurred, you say that you would yourself notify the harbour authorities? A. Yes.
- 40 Q. You concede of course that some harbour authorities might take action which other harbour authorities would not? A. That is possible. Throughout the world.
- Q. Yes? A. Yes.

Defendants
Evidence

No.34

G.W.Newton

21st February
1963

Cross-
Examination
continued.

Defendants
Evidence

No.34

G.W.Newton

21st February
1963

Cross-
Examination
continued.

Q. I suppose you would agree that any ships' officers would be concerned about - or you as a ship's officer would be concerned at the magnitude of spillage such as my friend has described to you? A. I would be concerned, Yes.

Q. Did you ever in your experience produce from your ship, either from you, or any other officer concerned, a spillage of that magnitude in a harbour? A. Not quite of that magnitude.

Q. The magnitude, to give you the greater detail of it, has been described as extending out - six hours after the spillage the oil being out towards Goat Island 500 yards, and as running fairly thickly down under the Yeend Street wharf into Mort's Bay, and the next day going around into Snail's Bay, and at 10 o'clock the men on the ship were still scooping up the oil on the deck of the ship and putting it into drums, where it was spilled about three inches thick. You will agree that was a very substantial spillage. Now that you have got greater particulars of it, no ship you have been on has ever produced one as bad as that? A. No. 10 20

Q. Or not nearly approaching as bad as that? A. No, I have had the deck over a foot thick in fuel oil, but I haven't had it where it extended into the harbour.

Q. You have not had a spillage of oil into the waters of the harbour? A. Yes. We have. The time of my most serious spillage has been where the deck of the ship has been about a foot thick in fuel oil. 30

Q. On the harbour? A. No, this is mainly on the deck of the ship.

Q. What would be the extent of your most serious spillage beyond the confines of the ship's perimeter? A. It is a little hard for me to answer that one, because as I mentioned before in this port of Abadan which was our main loading terminal, there was a tide action of about 4 knots, particularly on the ebb, which, if any spillage did occur into the water, there were no particular traces there a few hours after. 40

Q. The river would carry it away? A. Yes.

Q. So you cannot give any indication what extent beyond the ship that would be of any value? A. No, I cannot.

RE-EXAMINATION

MR. MEARES: Q. About putting this tanker in the middle of the convoy. Is that for the purpose of protecting the tanker or is it because this reduces the fire risk to the rest of the convoy or is it because it reduces the fire risk to the tanker? What is its prime purpose in putting it as close to the centre as you can if there are no other higher priorities? A. In my opinion, whatever the Lordships of the Admiralty had as their reason, I understand that it was the value of the ship and cargo was so high that she should be given the ultimate protection.

Defendants
Evidence

No.34

G.W.Newton

21st February
1963

Re-
Examination.

10 Q. You mentioned first of all that there were no bilges in a tanker, and then His Honour asked you a question and you said that there were bilges. May I take it underneath the engine room? A. In the curve of the ship's hull.

20 Q. Is there any problem in regard to these bilges in any way of anything in the bilges themselves, in addition to the bilge? A. The accumulation?

Q. No, I don't want to worry about accumulation. Leave out whatever is on the water in the bilges. Is there anything else in that bilge or close to the bilge which could be a danger, or don't you know? A. Well, the nearest thing that could be to them would be in the case of an oil fired furnace in a steel vessel.

30 Q. No. Actually in the tanker bilge, in the hull under the engine room. Are there any pipes or anything else there associated with the engine underneath the engine room that you know of? A. Not in the immediate vicinity of the bilges.

Q. However, is the practice in relation to pumping out this type of tanker bilge the same as pumping out any other type of bilge on any vessel? A. Yes I think so. It could be the company's policies that vary.

Q. Does the same principle for pumping out bilges apply to coal burners as to oil burners? A. Yes.

(Witness retired)

700.

No.35.

Evidence of P. Lusher

PHILIP LUSHER

Sworn, examined as under:

Defendant's
Evidence

—————
No. 35

P. Lusher

21st February
1963

Examination.

MR. MEARES: Q. Is your name Philip Lusher. A. Yes.

Q. Where do you reside? A. 32, William St. Double Bay.

Q. You are presently employed as a sea pilot in the Port of Sydney, and you have been in the pilotage service for a substantial number of years? A. Yes, 19 years.

Q. And I think you first went to sea in 1926? A. Yes.

Q. And you obtained your master's certificate in 1936, and you were in command of the Colonial Sugar Refining Company's freighter, the "Fiona" in 1940? A. Yes.

Q. How long were you at sea from 1926? A. From 1926 until 1943.

Q. And during that time were you mostly in coal or oil burners? A. Coal, oil diesel - all types.

Q. After you left the sea you became Marine Superintendent of the Colonial Sugar Refining Co.? A. That is right.

Q. And you left there to join the pilotage service and apart from a short period in Newcastle you have been stationed continuously in Sydney since 1945? A. That is correct.

Q. You would have a reasonably intimate knowledge of the various bays of Sydney Harbour and the various shoreside activities conducted in and around the bays? A. Yes.

Q. Your experience at sea took you to various ports, may I take it, throughout the world? A. Yes.

Q. I think you have been and were aware, whilst at sea, of the characteristics of a fuel oil insofar as its flashpoint was concerned? A. Yes.

Q. What did you think in the general run from fuel oils you used that the flashpoint was in general? A. Boiler fuel oil?

Q. Yes? A. 170 to 200 degrees.

Q. And you are aware of the meaning of course of flashpoint and fire point? A. Yes.

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Q. You are aware of the means of igniting this oil in a ship's boiler? A. Yes.

Defendants
Evidence

Q. What is the process? A. The oil is pre-heated to a required temperature to increase its viscosity, and it is pumped in through burners and atomisers, atomised, and set alight with a flaming torch put through the appropriate position, usually soaked in kerosene or some light oil, and it is so lighted.

No.35

P.Lusher
21st February
1963

10 Q. Is this something that takes place, this lighting, on the immediate application of the kerosene torch or not? A. No, not always.

Examination
continued.

Q. Do you get difficulties at times with it? A. Yes.

Q. You mean in relation to the time it takes to light it up? A. Yes.

Q. Have you had any knowledge of fuel oil ever being lit on a harbour, or other waters, in your seafaring or other experience? A. Direct personal experience, No.

20 Q. I think you are aware that there was a fuel oil fire in 1951, around the Sheerlegs wharf, are you not?
A. I am aware that there was a fire there, Yes.

Q. But I do not think you have been told the manner in which probably that fire started? A. No, I have not.

Q. Apart from not having been told that, you presently are not aware of any manner probable or possible by which that fire started? A. No, I am not.

Q. I want to ask you to assume that in 1951 - and I want you to consider the problem as if it now were 1951 - the "Wagon Mound" lying along Ballast Point - which you no doubt know? A. Yes.

30 Q. - was bunkering fuel oil with a flashpoint of 170. It was not a fuel oil that had to be pre-heated, and there is no doubt on one view of the evidence, and you can assume this to be a fact, that very substantial quantities of oil were spilt into the harbour and one could deduce that from the fact that the oil, some four hours after the spillage, extended quite a distance towards Goat Island. One witness says 500 yards, and at any rate on the day of the spillage, the spillage having occurred about 4 o'clock in the morning, it had
40 spread by the breakfast hour, or roughly 8 o'clock in and around Mort's Bay,; spread to this extent that it got around the Yeend St. wharf. Do you know that?
A. Yes.

Q. And underneath the Sheerlegs wharf and joiners wharf and the dry dock and so on? A. Yes.

Q. The extent which it had spread out in Mort's Bay cannot be definitely stated, but there had been some spread to some extent out there? A. Yes.

Defendants
Evidence

No.35

P.Lusher

21st February
1963

Examination
continued.

Q. I want you to assume that you had done it, as the master of a ship. You were responsible?

A. Yes.

Q. First of all would the spillage of such magnitude cause you very considerable concern?

A. Well I don't know what the magnitude was.

Q. Well, I cannot measure it, but I have told you of it. Would it cause you concern as a skipper? A. Concern from what point of view?

Q. I am asking you? A. It would cause me concern because I had transgressed the port rules and I would be liable to a fine of £1,000 personally, and it would inevitably lead to trouble and calls for explanations as to whose fault it was, and possibly disciplinary action and so on, and it would worry me from that viewpoint.

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Q. What about any physical damage that could have been caused by it? A. It could cause, as I have known it cause, extensive damage to paint work of pleasure craft with consequent claims and to property generally.

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Q. Around the foreshores? A. Yes, swimming pools and the like.

Q. This would cause you very considerable concern? A. Undoubtedly.

Q. Would you, in 1951, given the facts that I have given you, have had any concern as to it being a fire hazard? A. No.

Q. Could you tell me why? A. Fuel oil of that flashpoint flowed on the water it is almost impossible to ignite. I would say it is almost impossible to ignite it under any circumstances, particularly when it is floating on water, that it would have the coolness of the water on which it is floating and if you tried to light it, with the conduction of the heat to the colder water and so on, in the general circumstances I would say it would be quite impossible to ignite fuel oil when floating on water.

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Cross-
Examination

CROSS-EXAMINATION

MR. ASH: Q. I suppose you would know that inflammable liquid is classed by some people as 1 up to 150 degrees? A. Various local authorities have various -

MR. MEARES: There is one question I did wish to ask.

Q. As far as any pollution damage was concerned, and as to what you would do, what would you do having spilled it? A. I would feel it would be incumbent upon me to notify the port authority and admit I had transgressed.

Q. Would you yourself take any action with regard to it? A. It would be outside my province to do so.

Q. Why? A. Because the responsibility is that of the port authority (Objected to).

10 HIS HONOUR: I shall not have it struck out, but you can debate it afterwards.

Defendants
Evidence

No.35

P. Lusher

21st February
1963

Cross-
Examination
continued.

CROSS-EXAMINATION
Continued

MR. ASH: Q. You were saying that some authorities regard liquid as inflammable up to 150 degrees?

A. No, I did not say they are. I say that the classification of their inflammability would vary according to whatever the local Act was, and it might vary from place to place.

20 Q. If you know about the Act you would know that the Act in this state classes them up to 150 degrees as inflammable? A. I am afraid I have not studied the Act.

Q. Do you know that fact, that the Act here, whether you have studied it or not, classifies them up to 150 degrees as inflammable? A. No.

Q. You would at once agree that if fuel oil is ignited it will burn? A. In certain circumstances, Yes.

30 Q. What circumstances? A. Well, if it is ignited as I previously described, under the boiler of a ship it will burn and continue to burn while it is being pumped in.

Q. Go on. What other circumstances? A. It will ignite in the cylinders of a diesel engine, boiler oil and if it overflows in the engine room of a ship when it has been pre-heated. I have seen fires of that nature, and there may be other conditions. They are the only ones I can think of at the moment.

Q. How big was this "Fiona"? A. About 4,000 tons dead weight.

Q. What was it? A. A semi-tanker.

40 Q. You would have to explain it? She was engaged in the exclusive trade of the Colonial Sugar Refining Company business carrying raw molasses in tanks and raw sugar. I was also in command of other ships of that company.

Q. Did you carry any oil at all in the "Fiona"?
A. No.

Defendants
Evidence

No.35

P. Lusher

21st February
1963

Cross-
Examination
continued.

Q. Did you have any fire precautions on the "Fiona"? A. Yes.

Q. And fire drill? A. Yes.

Q. And fire surveys, equipment surveys? A. Yes, of course.

Q. I take it you were always conscious of the danger of any fire on your vessel? A. Yes.

Q. Have you done any bunkering yourself? I mean by that has your ship taken on bunkers? A. Every ship I have ever been on has taken on bunkers. 10

Q. Then you would know of the great fire precautions taken at a bunkering terminal? A. It depends on the terminal and the class of fuels carried.

Q. Take an ordinary oil terminal dealing in bunkering oil and other oils. There are extensive fire precautions aren't there? A. Yes.

Q. And you would agree that if furnace oil is spilt in quantity, and if it did catch fire, it could be a fire hazard? A. It would depend where it was spilt. 20

Q. Let's take that. If it was spilt say on the deck of your ship I take it that you as master would take every step to clean it up and disperse it as quickly as possible? A. It would be a very difficult thing to do because you would not be allowed to wash it over the side of the ship and I would be in some doubt how you could disperse it if it was spilt on the deck of the ship in some quantity.

Q. Well I take it you would endeavour to scoop it up and contain it in barrels or something of that sort? A. Yes. 30

Q. And you would do that I take it because while it was there it was a potential danger if any flame or fire came in contact with it? A. I would not agree with that. I would say if fire occurred it could increase the hazard of the spread of the fire, but not of itself.

Q. That is what I really mean. If the fire were to come in contact with it in those circumstances it could spread pretty quickly and cause damage? A. Yes, a substantial fire could help to spread it, Yes. 40

Q. So I suppose you would agree, taking a land spot or shore spot, that would apply wherever you had a substantial quantity of oil spilt on the shore or in the deck of a ship; you would want

to keep flame and fire away from it? A. Yes, you would want to keep flame and fire away from any installation. You are not going to encourage fire. I said I do not feel it would be a danger of itself, but should fire occur it could assist in spreading the fire.

Defendants
Evidence

No.35

P.Lusher

Q. We are talking about the furnace oil, and wherever it was spilt then you would say if fire came near it, then the danger would start? That is how you would sum it up?

21st
February
1963

A. A substantial fire; I do not mean somebody dropping a match like you would with benzine or anything like that.

Q. What you mean is a sufficient fire to ignite it?

A. Yes.

Cross-
Examination
continued.

Q. And that would apply wherever the fuel oil was, the furnace oil? A. No.

Q. You have agreed with me it would apply on the deck of a ship and on the shore, such as on the ground or wharf, or concrete, anywhere on land? A. Not on concrete, No.

Q. Not even if it was a foot thick on concrete? A. If something adjacent to it went on fire and you had a quantity of oil a foot thick, then if there was an intense fire oil might be heated to the extent that it would increase the fire.

Q. I thought you had agreed with me that if you have got a substantial quantity of furnace oil anywhere, on the deck of a ship or on any part of the shore, and fire does come in contact with it, then it is likely to spread and do damage? A. I qualified the type of fire. I will agree with you subject to the type of fire. If an intense fire came in contact with it it would increase the hazard.

Q. If it was fire of sufficient heat too? A. Not sufficient heat; sufficient intensity. A pencil point of oxy torch would not ignite it.

Q. If it was of sufficient heat to ignite the oil? A. No, I cannot agree.

Q. So you place no store at all on the fact of the oil to be ignited? A. I don't follow that question.

Q. I don't follow it either. I thought you said earlier that if you have a flame or a fire sufficient to ignite the oil? A. I don't think I said a flame. I said flame of sufficient intensity.

Q, I suggest you have given this matter some thought before you came into it? A. Just in a matter of hours.

Q. Has it been indicated to you the type of questions and the type of evidence - would you get your mind off "much flame". I am talking about a flame - it might be a foot wide or 50 feet wide, just a flame but as long as it was sufficient to ignite the oil. Do you follow me? A. If it was sufficient to ignite the oil.

Defendants
Evidence

No.35

P. Lusher

21st February
1963

Cross-
Examination
continued.

Q. Then you concede that the fire could spread and could cause damage? A. Yes, if it was sufficient; that is if it was on the deck of a ship or on the shore.

Q. It would apply I take it to oil lying on the shore? A. If there was a flame of sufficient intensity applied to it, oil lying on the shore, then the same considerations would apply.

Q. And indeed it would apply to oil lying on the pile of a wharf would it not? Again if you had a flame sufficient to ignite it?

A. All those things are dependent entirely upon circumstances which cannot be described in sort of overall terms, I do not feel, or answered in overall terms.

HIS HONOUR: Q. You and Mr. Ash seem to be spending a lot of time on debating matters which I thought were reasonably clear. Would you agree with this, that if you have got oil on the deck, on the shore or on the pile; secondly, you have got a flame sufficient to ignite it, and thirdly you have got atmospheric and perhaps other conditions such as will support combustion, then your oil will burn. Is that all right? A. Yes, I will agree with that.

MR. ASH: Q. You have had described to you by Mr. Meares this oil spillage, roughly? A. Yes.

Q. And you can assume it did go 400 or 500 yards out towards Goat Island and around the Sheerleg and right around the bay and remained there for some time? A. Yes.

Q. And with the rise and fall of the tides it severely fouled the slipway, there was oil on the shore and coated the piles. A. Yes.

Q. Arising out of what His Honour says, it follows that if you had a flame of sufficient intensity around there you could have a fire?

A. Sufficient intensity applied for sufficient length of time.

Q. Yes. A. You would get a fire on the pilings, slipway or anywhere.

Q. The oil? A. No, the extremely dry wood.

Q. If you had the oil there, from what you said it appeared to me to follow that if you had oil in all those places? I said that if you had a flame sufficient to ignite that oil and conditions to maintain this flame for sufficient

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time to ignite it, then you would expect a fire danger because of the existence of the oil and the spread of the fire? A. You are asking me had I been the master of that ship?

Defendants
Evidence

No.35

Q. No, I did not ask you that. I am just asking your view in 1951. A. Would you mind putting that question again?

P. Lusher

21st February
1963

10 Q. You have all this oil in the places I told you; it is on the water, on the piles and on the foreshore. If you get an ignition agent and it flames there sufficiently long to set the oil alight on a pile or portion of it, on the shore, or even on the water, then you would agree that the presence of the oil would make the fire spread more quickly? A. If such a set of circumstances could exist, Yes, it would be possible.

Cross-
Examination
continued.

Q. You, in your travels around the world, have heard of fires in harbours haven't you? A. Yes.

20 Q. And fires at installations in harbours unconnected with oil on water, haven't you? A. Yes.

Q. And you would agree with me that if there was fire on a wharf, however caused, a good fire got going, then the oil underneath it in the circumstances I have described would be a considerable hazard to the spread of the fire if you had a fire on the wharf?

30 A. It would depend on the height of the wharf above the water. I feel that oil flowed on water is almost impossible to ignite, but oil on the water could assist the spread of the fire, but you would have to have a fire of great intensity close to that oil on the water and then it might possibly, but it is a set of circumstances.

HIS HONOUR: Q. You have used two expressions. Which one do you prefer? You have said that on the water oil - and I mean fuel oil of this kind - would be almost impossible to ignite? A. Yes.

Q. And you did also say it would be quite impossible to ignite. Which one would you prefer? I am not criticising you for having used the two expressions, but I want to get it clear? A. I would say almost impossible.

40 MR. ASH: Q. To ignite by what means? A. By any means.

Q. By any means at all? A. Yes.

Q. Even if the wharf above it was blazing from end to end over a distance of 500 feet, you think it would be hard to ignite, do you? A. Yes.

Q. Do you think that oil on the piles, if there were oil on the piles of that wharf burning from end to end - do you think the oil on the piles would be hard

Defendants
Evidence

No.35

P.Lusher

21st February
1963

Cross-
Examination
continued.

to ignite? You have already expressed the opinion that the oil on the water - A. If a wharf of 50 feet long was blazing it would be impossible to stop those piles blazing whether there was oil there or not.

Q. You said that in such a situation it would be most unlikely the oil on the water would ignite?
A. Yes.

Q. What do you say as to the likelihood of the piles of that wharf, being coated to about 4 or 5 feet above water level? A. The fact the piles were coated with oil would not make any difference if the whole of the wharf was blazing for 500 feet. 10

Q. Did you not know of the fire of oil on water in Sydney Harbour in 1943? A. No, I was at sea then.

Q. You have heard, from what you said, although you haven't seen it personally, of fuel oil fires in harbours? A. I have heard of oil fires, tanker fires, exploding tankers, leaking tankers and so on, but the nature of the oil I have always understood to be in these cases a light oil. 20

Q. You have assumed it? A. From my discussions with men who have had experience and been in them and I have taken it to be that.

(Witness retired)

No.36.

Evidence of H.R. Goode

HAROLD RALPH GOODE

Sworn, examined as under:

No.36

H.R.Goode

21st February
1963

Examination.

MR. MEARES: Q. What is your full name?

A. Harold Ralph Goode. 30

Q. Where do you reside? A. 33 Fairlight Crescent, Fairlight.

Q. I think you are a combustion engineer?

A. That is right.

Q. And you are a Bachelor of Engineering at the Adelaide University having graduated in 1941?

A. Yes.

Q. And you are an Associate Member of the Institute of Fuel? A. Yes.

Q. After graduating in 1941, until 1946, were you engaged in any occupation at all concerned with fuel or not? A. During that period I was in the armed services and not particularly engaged in fuel. 40

Q. Were you in the Engineers? A. I was in the Royal Australian Mechanical Engineers.

Q. But concerned with vehicles? A. With electronic matters.

Defendants
Evidence

Q. In 1946 I think you joined the Shell Company?
A. Yes.

No.36

Q. And from then until now, some 16 odd years, in that company you have been associated with fuel production? A. Fuel utilisation.

H.R.Goode
21st February
1963

Q. You were in Brisbane with Shell from 1946 to 1951? A. Yes.

Examination
continued.

10 Q. And since 1951 you have been in Sydney? A. That is right.

Q. Since 1951 you have the classification in the company as an oil and fuel engineer? A. That is the common classification - combustion engineer or oil and fuels engineer. We change the terminology domestically within the company from time to time.

20 Q. As far as you are concerned, being a member of the Institute and a Bachelor of Engineering, and from your experience with the Shell Oil Company, have you an experience of various types of oils and their constituents, their inflammability, their combustibility and so on? A. Yes.

Q. Since 1951 has this been a problem with which you have been actively associated? A. Yes, it has been almost my sole problem in conjunction with the general development of utilisation of fuels for marketing purposes.

30 Q. You have a knowledge of the characteristics of various types of oils, including fuel oils under varying types of circumstances? A. Yes.

Q. You are of course acquainted with the various flashpoint tests that are used? A. Yes.

Q. You have done them yourself? A. No, I have not. I have not been a laboratory chemist conducting such tests. I have seen them carried out many times and I know the procedures laid down for them.

Q. You understand the meaning of flashpoint and the difference between that and fire point? A. Yes.

40 Q. Actually, in Sydney, where are you working as far as the location is concerned? A. Located at the corner of Margaret & Carrington Sts. Sydney.

Q. Is the Shell Company concerned with the manufacture and refining and selling of fuel oil for bunkering of ships? A. Yes.

Q. I cannot ask you what your reactions would have been as the Captain of a ship but as a combustion engineer I would ask you this: to assume that at Ballast Point a

Defendants
Evidence

No.36

H.R. Goode

21st February
 1963

Examination
 continued.

ship had cast forth upon the waters a very substantial quantity of Vacuum Fuel Oil of a flash point of 170, with a viscosity that did not require pre-heating, and that the extent of the spillage was such that the oil spread over a large part of the harbour.

As an example it has been said it went 500 yards towards Goat Island from Ballast Point and it drifted around Mort's Bay and in and underneath installations on the shore and on to the shore line, and it moved around and I think the next day, it has been suggested, it went to Snail's Bay and apparently it remained around in varying degrees of intensity for possibly a few weeks, so I think you can assume that the spillage, accepting that evidence, was a substantial spillage. Do you understand the question? A. Yes. 10

Q. If you had had the question posed to you in 1951 would you have been of the opinion that that spillage constituted a fire hazard? A. My general experience with oils of this type are that they are not fire hazards in a bulk or liquid form. All my experience to that date would have indicated that it is quite a difficult and deliberate task to get oil to light if it is an open surface oil; even when you have an oil in a confined space, such as in a basin or bowl, as it is when carrying out flashpoint tests - although I have not seen a fire burning on water where the oil has spread on it, I would think it would be more difficult to ignite under any circumstances when spread on the surface of the water. 20 30

It is of course a combustible material and if it was in close proximity to some fire which was burning of its own accord, then of course the oil would be consumed by virtue of proximity and heating from some other substantial fire, but I would regard it as a highly non-volatile material spilt on the surface of water which was not subject to ignition by any, what I would call, simple cause. It would require quite a substantial cause to even cause the oil to combust, and that would be in my opinion only in the presence of some other substantial flame. 40

HIS HONOUR: Q. You were asked some questions about the assumptions you were to make. Are you familiar with the details of Mort's Bay, Ballast Point etc? A. No, only by brief hearsay.

MR. MEARES: Q. This assumption is that in Mort Bay, there are more than that shipbuilding or repairing installation? A. Yes.

Defendants
Evidence

Q. I think the Adelaide Steamship wharf does some repairs in their ships or around their ships, and there is the Sheerlegs Wharf. You know of that? A. No.

No.36

H.R.Goode
21st February
1963

Q. I want you to assume it is just around from Ballast Point. A. Yes.

Examination
continued.

10 Q. And the Morts Dock Company was there in 1951. A. Yes.

Q. And they have a dry dock? A. Yes.

Q. And there are various slipways, where ships can be slipped, and boat repair yards, and things of that nature. A. Yes.

Q. You do not alter your view in any way? A. No, not regarding this matter.

CROSS-EXAMINATION

Cross-
Examination

20 MR. ASH: Q. Were you asked to give evidence of this matter only recently? A. It was a matter of a week ago, I think.

Q. And I think one of the first steps you took to brief yourself to give evidence, was to ring up Professor Kirov? A. Well, I rang up -

Q. I am not suggesting there was anything wrong in so doing. A. Yes. Professor Kirov and I have known one another for quite a while. He is in the University of New South Wales and I am in the Shell Company.

30 Q. You liaised in the past quite a lot? A. In regard to fuel matters, yes.

Q. I am not suggesting there was anything wrong but, as part of the briefing of yourself to come to Court, you rang Professor Kirov? A. Yes.

40 Q. He was the first man you rang? A. No, not at all. I had very little information at all when first requested to appear as a witness, and I asked if any of our people around the Company had any information, because I was naturally interested in what it was about, and few of our own people had any information, and I started to enquire amongst people who I thought might have information, outside, but at the time I rang Professor Kirov I had no knowledge of what were the circumstances of this and was quite unaware, of course, at that time, that he was involved.

Defendants
Evidence

No.36

H.R.Goode

21st February
1963

Cross-
Examination
continued.

Q. The name just came to your mind; that he might know something about it? (Objected to)

Q. I suppose, if we take it step by step you will agree that the fuel oil will burn if it is ignited? A. Under certain conditions. There are very special conditions which I think are involved.

Q. You would agree with me that, if a flame of sufficient heat to ignite it is in proximity to it, it will burn? You will agree with that? 10

A. Provided the oil is heated to a temperature at which it will ignite. It has first to be raised to a temperature at which it will give off sufficient volatiles, and the gases which come off mix with air -

Q. They are the things which burn? A. They first have to come off the oil.

Q. Exactly. Let me take a kerosene tin, cut in half longways. A. Yes.

Q. Full of this furnace oil. Say you have a flame adjacent to it or on it, sufficient to ignite it. Do you agree that it will burn? A. If the flame is sufficient to heat the surface of the oil above the flash point of the oil, yes. 20

Q. You said a flame vapourises the oil all around it? A. Yes.

Q. I am putting to you if you have a flame in proximity to the oil, it is probable that if the flame keeps going a sufficient time, it will ignite the vapour of the oil around it? A. Provided the conditions are such that I can relate it to what I know of the physical requirements to ignite oil. The flame would have to be sufficient to bring the surface of the oil in this can, to a temperature at or above the flash point of the oil. 30

Q. I am assuming that the oil itself, or some object in it, is burning with a flame, and is being maintained as a flame. A. Yes.

Q. Will you agree with me that the flame being continued in proximity to the oil, will vapourise the oil around about it? A. Yes, although you could, if you had a little oil here, and you threw a match on it, find it would blow itself out. 40

Q. I am certain of it. Surely you would agree with me, if you get your mind away from a match, with a bit bigger flame, something burning -
A. Yes.

Q. - something burning with a flame and continuing to flame in proximity to the oil - A. Yes.

Defendants
Evidence

Q. - would you agree with me that that will vapourise the oil and, if the flame is still going, will burn over the surface of the oil? A. If you are confining your remarks to this can of oil; you are doing that, I presume?

No.36
H.R.Goode
21st February
1963

Q. Yes. A. Yes.

10 Q. Will you agree with me that the flame could ignite the oil in that way - the flame and not the match - wherever the oil? A. No. My experience would not indicate that that could occur necessarily.

Cross-
Examination
continued.

Q. Let us take it step by step. Would you agree that it would ignite the oil if lying on the floor and it is of sufficient area and you have your flame there? A. Yes. Q. Would you agree that it would happen if it was lying anywhere in the same way, if you have your flame there? A. Not necessarily. With oil on water, water of course has an enormous capacity to absorb heat and, under those conditions, I think the water would absorb so much heat that the oil temperature could not rise.
20 Water has a large heat capacity.

Q. Do you think it would make any difference, the thickness of the film on the water, in that regard? A. I can speak with no experience on this matter. I feel I could not express an opinion on something on which I have not had sufficient detailed experience or examination - a film of oil on water.

Q. May I take it you really have not sufficient experience to express an opinion on this matter of fuel oil, catching alight on water? A. On water?

30 Q. Yes. A. I do not know that anybody has seen it catch alight on water.

Q. May I use your phrase, that you had not had enough experience of oil on water? (Objected to).

HIS HONOUR: Q. You did have a long question put to you about this spillage of oil? A. Yes.

Q. Spreading out in the Harbour and so forth. A. Yes.

40 Q. Do I take it that the putting of those facts to you and your assumption that they were correct, would not enable you to form an opinion as to what would be, or what would be likely to be the thickness of the oil layer lying on the water? A. Not very exactly, I can imagine it, of course, as a film of oil which might vary in thickness from a few thousandths of an inch to a reasonable proportion. That would seem to me to depend on time and circumstances and all that.

MR. ASH: Q. Is this the position, that you feel you would rather not express an opinion on how the thickness

Defendants
Evidence

No. 36

H.R. Goode

21st February
1963

Cross-
Examination
continued.

of the oil might affect this question of the cooling effect of the water? A. There are certain ways in which I feel, and from my own knowledge, there could be certain calculations made, but I think I would have to insist that my own experience of what a measured thickness of oil is on the surface of the water - I have not done that. If someone could quote to me a certain thickness of oil on the surface of the water, I feel then it does lend itself to a reasonable analysis as to what extent the application of heat to that surface of oil would result in either the oil temperature rising to the point where it might catch alight, or the heat being conducted away into the water. But I have not done any such calculations nor done nor seen any tests which would enable me to express an opinion, but I do think that the substance of such work is there.

10

Q. Might I put this to you shortly? You have expressed an opinion as to how fuel oil, if a flame is there, could ignite on shore surfaces?
A. Yes.

20

Q. But you said then, "But I hold a different opinion of it on water"? A. Yes.

Q. Why is there a different opinion on water?

A. If you are speaking of a film of oil on a surface such as a wooden surface, it is comparatively easy to raise the temperature of the oil to a point where it will light.

Q. The sole distinguishing feature is the temperature of the water underneath? A. Yes.

30

Q. And you have not conducted experiments on that matter, of the cooling effect of water underneath a film of oil? A. No.

Q. Therefore, it is only a layman's assumption that there would be such a difference. A. No. I would not agree with that.

Q. What prompts you to say there is a difference? A. The basic principles of conductivity of heat.

40

Q. You know, of course, that oil is not a good conductor? A. Yes, but this is a thin film of oil, and that is what I meant when I said that the thing lends itself to examination; that with the thinnest film, the heat will conduct away very quickly.

Q. The thicker the film, the greater chance of it being ignited like a shore oil? A. Yes, the thicker the oil but, there again, I still contend that oil

is a non-volatile substance and, igniting it in any depth - you spoke of igniting a film of oil on the surface ashore, but igniting oil in depth, even in oil alone, is much more difficult to do than lighting oil on a wooden surface.

Defendants
Evidence

No.36

H.R.Goode

21st February
1963

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Q. You would agree that the same considerations that would apply to the oil on the land or the floor or other stationary places, would apply to oil on the shore or oil on the piles of a wharf? A. That is one which would be, to my mind, affected by the way in which the water might be soaked in those piles, and to what extent the oil and water were in any way combined or emulsified or anything like that.

Cross-
Examination
continued

Q. You envisage the possibility of a falling tide coating the pile with oil and that thin film of oil becoming emulsified, do you?

A. There again, that question I think, is a problem that a chemist is more familiar with than engineers.

20

Q. You mentioned emulsification. That is the problem you were talking about? A. I would rather suspect I would look for some way in which the oil might be affected by the presence of a very considerable amount of water and weed and so forth, you would expect to find around piles.

Q. Are you familiar with welding? A. Yes.

Q. And oxy cutting? A. Yes.

Q. Speaking generally, you know that the molten metal and slag and sparks from those things, can ignite combustible material? A. They can, yes.

30

Q. You agree with that? A. Yes, anything combustible.

Q. And would you agree with this, that special care should be taken to prevent sparks, slag or hot metal particles coming in contact with mineral oil on water surfaces, particularly in the vicinity of wharves and ships? A. I would not be concerned to see sparks or drops of hot metal or anything falling into oil on the water at all. I consider that would be immediately extinguished.

40

Q. You would not think special care was required to stop it? A. No. If my considered opinion were asked on that, I would feel it was virtually so impossible to ignite the oil by that means, that I would not be at all concerned.

Q. Have you ever heard of cases where thin layers of oil discharged from ships or accidentally from tankers or waterside oil tanks, have been ignited through cutting operations, even under winter conditions, with ice on the surface of the water? A. Not oils of high flash point, no.

Defendants
Evidence

No.36

H.R.Goode

21st February
1963

Cross-
Examination
continued.

Q. You are familiar, are you, with S.A.A. codes? A. Yes.

Q. Have you ever directed your mind to the S.A.A. code for fire precautions in cutting and welding operations, published in 1945? A. Not that one.

Q. Would you accept the S.A.A. code as a code of considerable stature, in certain sections of which the oil companies themselves contribute their thoughts? A. Yes.

10

Q. And you would accept that as a wise precaution? (Objected to).

HIS HONOUR: I think you can ask him whether what they say is correct.

Q. MR. ASH: (Approaches witness) You can accept that as authentic, April 1945. Would you agree this is the heading, "Wharves and Ships"? A. Yes.

Q. "Special care should be taken to prevent sparks, slag or hot metal particles coming in contact with mineral oil on water surfaces, particularly in the vicinity of wharves and ships". Will you agree with me that that is a sensible precaution, in your own opinion? A. In view of the wide nature of petroleum oils which might be on the surface of the water, I think it is an essential precaution. Those oils could vary from a light spirit to a heavy oil.

20

Q. "mineral oil" does not confine itself, as an ordinary term, to kerosene and -
A. The term "oil" is used widely, and especially in the use of codes and things like that.

30

Q. You do not think that that "mineral oil", as I read to you, covers furnace oil?

A. I think it would include furnace oil.

Q. You would agree that if that document is authentic, this code has seen fit to extend that precaution to fuel oil on water? A. I think they must have a general precaution, but my own opinion is, as far as fuel oil is concerned, in the event of welding, those sparks would not ignite fuel oil. They might ignite a spirit or a -

40

Q. I am not putting a bit of molten metal falling straight on to the water. It might go through even petrol, dropped from 10 to 12 feet. It would not be there long enough. A. Yes.

Q. To generalise the matter, you would agree that if you have oil on water, right under the Sheerlegs Wharf, say 650 feet x 40 feet, a wall at the back and the piles covered at tide level - A. Yes.

Defendants
Evidence

No.36

Q. - and these foreshores at the back, during the tide covered, and covered quite substantially, you would agree with me surely that that constitutes a fire hazard underneath a place where welding operations and oxy cutting operations are going on?

H.R.Goode

21st February
1963

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A. Well, I doubt that I would. After all, I have seen catch-trays for oil, in the front of furnaces, for years, without catching alight. I have seen fuel connexions, where this type of oil is pumped into some sort of receiving pipe and a spillage occurs into these trays, in front of these furnaces, and I have seen persons drop pieces of cigarette butt and rags into these trays, and that is why I thought with oil on water, under a wharf, where the temperature is lower, surely it would be a vastly more difficult situation in which to light the oil.

Cross-
Examination
continued.

20

Q. I am not putting it to you that while the oil is so lying under that wharf, in that condition, there is a chance every moment of the day, a probability that a fire will start. I am putting to you that if you have that situation, the stage is set, when you have these operations going on, for the possibility of a fire. Surely you would agree with that, would not you? A. Yes, I think, as I stated earlier, particularly if anything on the wharf should catch alight, the presence of that oil there as a combustible material, adds, but I would not consider it any more dangerous than, say, debris floating around under the wharf or chunks of timber.

30

Q. What do you mean? If the welding and cutting operations are going on above there, you would not consider it any more dangerous than debris being on the water? A. In a high flash point oil. That is an extremely non-volatile material.

40

Q. You mentioned the possibility of a fire, or something starting to burn on the wharf? A. Yes.

Q. Would you agree with me that if that fire were there and got down underneath, and remained alight sufficiently long to ignite the oil immediately around it the oil would burn. A. The oil would burn along with the rest of the other combustible material there.

Q. I accept from you that it is not inflammable, in the sense of petrol. A. Yes.

Q. But I am putting to you that the fact of the oil being there, on the water, on the piles, on the foreshore, if a fire started through no fault of

Defendants
Evidence

No.36

H.R.Goode

21st February
1963

Cross-
Examination
continued.

the oil at all, but if it started, that would be a substantial hazard for its quick spread and possibly extensive danger? A. I am very doubtful of the extent to which oil on water would cause a quick spread. That is a subject which, from my own knowledge of combustion of oil, I would have grave doubts about. I think the oil in close proximity would become heated and burn with the rest of the material, but from my own experience the oil itself would not cause a fire to spread - from my knowledge of the behaviour of oil.

10

HIS HONOUR: Q. Once some of the oil started to burn, assuming that it did in conditions such as that, with an open air surface above it, would it not generate a lot of heat? A. Yes, but my feeling was with the oil spread over the surface, the heat would not be able to reach very far towards the outlying oil and in my opinion, it would need a test. The flame would burn away the oil and it would depend on the rate at which the flame consumed oil adjacent to the flame and could reach further oil, to bring it up to a combustible temperature. I could only answer the question with the result of an analysis at what rate the flame can consume oil. If it is consuming oil at a greater rate than the radiant heat can heat the oil in front of the flame, I cannot visualise the flame spreading.

20

MR. ASH: Q. You expressed an opinion as to whether this oil on water, that day, was a fire hazard. A. I am not sure what that means.

30

Q. MR. MEARES asked you a question about a substantial quantity of oil spilt on the Harbour. A. Yes.

Q. And you said it was not a fire risk. A. Yes, I think I said it.

Q. You do not know how quickly that oil, if ignited, would spread under that wharf; you have no idea, have you? A. I am basing my opinion -

40

Q. I am asking for a short answer. Have you any idea at all, as at 1951, how long that would take to spread? A. Not from my personal experience.

Q. From any experience? A. Well, not from any experience that has been related to me.

Q. So you do not know, speaking as at 1951, for the purposes of this opinion, how quickly that was likely to spread, if ignited? A. My ideas were based on what I had seen of oil burning in places where it is applied, where it may be spread in drip trays and so on, and relating that to conditions which would apply on the surface of the water, to those conditions.

Defendants
Evidence

No.36

H.R.Goode

21st February
1963

10 Q. You have never seen oil burning on water. Is that right? A. Yes.

Q. You would agree with me, would not you, that your opinion of how quickly fire would spread, if ignited under that wharf in 1951, is pure guesswork? A. No. It has been based on a theoretical opinion.

Cross-
Examination
continued.

Q. An opinion, as I understand it, based on no experience of your own? A. That is right.

Q. No knowledge of what anyone told you? A. Not of oil on the surface of the water.

20 Q. So you can forget any experience and knowledge or precedent? A. Yes.

Q. You do not claim any chemical training in the matter? A. Well, I would not say not any.

Q. Not sufficient to express an opinion on this point. That is right, is not it? A. What chemical point do you require?

30 Q. Any aspect of chemistry which would enable you to say Yes or No to a quick spread of fire under that wharf, if the flame was present?
A. I do not know of any aspects of chemistry which would relate to it. It seems to me to be a question of volatility.

Q. Won't you agree that on that matter, your opinion has no foundation at all? A. No. I think I have endeavoured to tell you that the whole basis of my opinion is my experience of handling oil ashore.

Q. In drip trays? A. Well, in drip trays and similar cases where oil may be burnt.

40 Q. As regards the ignitability, of the first ignition, you would not claim to have any experience except that you know that you cannot ignite it with an ordinary flame. You know that, don't you? A. That is a very broad question. I would say I have had quite a lot of experience in igniting oils, but the conditions under which they ignite have to be satisfied.

Defendants
Evidence

No.36

H.R.Goode

21st February
1963

Cross-
Examination
continued.

Q. Let us take furnace oil for a start. What is your experience in igniting furnace oil?

A. Generally. The main experience, of course, is when the oil is properly prepared for combustion, which is usually by spraying it into a furnace with a spray, mixed adequately with air. With other types of furnace oil, it is possible to produce a lot of smoke and a very lazy flame, and that usually requires a blowtorch blowing on the surface of the oil, to keep it alight.

10

Q. Have you ever tried to light it, lighting anywhere, just as furnace oil? A. Yes.

Q. And you have done this with a flame? A. Yes.

Q. What sort of flame? A. A piece of burning rag on the end of a piece of wire, using for igniting a burner.

Q. And have you ignited it that way? A. No. The usual procedure is to douse that flame by putting it in a can of oil.

Q. So far, you have put out an ignition agent. Have you ignited it when it is lying on the floor or in a tin on the floor, or just furnace oil lying somewhere? A. Only by a long-term application of some considerable amount of heat to the surface, where the source of heat is comparatively reasonably large in comparison with the surface.

20

HIS HONOUR: Q. I understood you were talking about things you had done? A. Yes.

Q. What source of heat did you use? A. In one case a blow torch applied to a piece of rag which was hanging over the side of a bucket, and the blow torch was used to heat the oil on the surface of the can and to ignite the rag at the same time, to establish a hot surface and a burning flame adjacent.

30

MR. ASH: Q. When did you do that? A. Back in 1948 or 1949.

Q. Why did you do it? A. It is quite extensively used for what they call frost-burning pots, where oil is placed in a pot - you have a number of them - and if the frost is imminent a piece of rag is hung over the side of the pot, oil soaked. They go around with a blow torch, heating the oil and the rag. You can get the oil to light. But it is not easy to do. One of the difficulties is that in the time allowed, you cannot get the oil to light.

40

- Q. Have you had any other experience, other than that in 1948, as to lighting fuel oils? A. No, not in -
- Q. Is there any other experience that you have had, igniting furnace oils, other than that? A. Under the conditions of the atomized spray, yes, frequently.
- Q. I am talking about furnace oil lying somewhere, whether in a tin, in a box or on the floor, or wharf. Have you had any other experience of that? A. Yes, a very frequent experience of dousing igniting flames or igniting torches in oil; not to ignite it, but to douse it.
- Q. This 1948 experience is the only time you sought to ignite it? A. Yes.
- Q. Would you agree with me that that is not a sufficient basis to express an opinion as to the fire hazard of the oil under Mort's wharf, in 1951? A. I feel I had sufficient experience to express an opinion as to the difficulty of igniting it, because all my experience indicated that the oil just does not ignite readily.
- Q. Would it sum it up by saying that your experience boils down to this, that fuel oil you know, does not ignite readily? (Objected to; rejected).
- Q. That is a factor in the opinion you have given, that you know that furnace oil does not readily ignite?
A. Yes.
- Q. There is no other factor in your opinion, is there?
A. Well, I expressed all the factors that I feel I have been aware of. I feel that there are other factors involved, in my various expressions up to date.
- Q. Can you name one of them, just before we stop. A. You asked me if I had ignited oil, which I have done -
- Q. I was not asking you about the basis of the opinions or tests you have given. I am asking you one factor in the opinion you expressed as to that oil, under that wharf in 1951 - that that furnace oil is not easy to ignite.
A. Yes.
- Q. What is another factor in that opinion? A. The factor affecting the ignition of the oil on the surface of the water?
- Q. Yes. A. That is the core.
- Q. Is there anything around the core, which you wish to add? -
- HIS HONOUR: The cooling effect of the water.
- MR. ASH: Q. Well, that exhausts it, does not it - those two factors? A. I think we discussed the thicknesses of films.

Defendants
Evidence

No. 36

H.R. Goode

21st
February
1963

Cross-
Examination
continued.

Defendants
Evidence

No.36

H.R.Goode

21st February

1963

Cross-Examination
continued

Q. But you were unable to express an opinion, any concluded opinion on that aspect? A. Any concluded opinion.

Q. And that cuts it out, does not it? A. Yes.

RE-EXAMINATION

Re-Examination. MR. MEARES: Q. You did say that vapours have first of all to be caused to come away? A. Yes.

Q. I think I have you down precisely. What did you mean by that? A. To be emitted from the surface of the oil.

10

Q. And when did you get the vapours coming away?
A. When the oil is heated. If an oil's flashpoint is 170 degrees Fahrenheit, it requires that the oil shall be heated to 170 before vapours will come away in sufficient quantity to mix with the air present, to ignite. That is virtually what flashpoint is.

Q. But insofar as oil is concerned, well beneath the flashpoint of 170 - if you like, on the water or elsewhere - until you get close to the flashpoint is there anything other than an infinitesimal quantity of vapour coming off? A. I could not give you a definite conclusion on that. I would regard it as a quantity of vapour too small to ignite in air normally present in ambient conditions above the surface of the oil.

20

HIS HONOUR: Q. Has anybody given you an account of what is said to have happened in this Morts Dock fire? A. I have heard many bits and pieces.

MR. MEARES: Deliberately, I have not.

30

MR. ASH: I can assure Your Honour the Professor neither volunteered nor was asked.

MR. MEARES: Q. I have not told you how the fire was caused? -

MR. ASH: I accept that from you, at once.

HIS HONOUR: It was a little curious hearing him asked all these general questions about behaviour of oil on water and so forth, and giving opinions. It would now be a matter of great interest to him to have an account of how this happened.

40

MR. MEARES: I have promised to tell him.

HIS HONOUR: We had another witness earlier, who went so far - although he qualified it - as to say it was quite impossible to ignite this oil on water. But it happened.

MR. MEARES: I have not deliberately done that, for the reason I have been fearful.

HIS HONOUR: I understand.

(Witness retired).

(Further hearing adjourned to 10.00 a.m. on Friday, 22nd February, 1963).

Defendants
Evidence

No.36

H.R.Goode

21st February
1963

Re-examination
continued.

IN COMMERCIAL CAUSESNo. 3000 & 3001 of 1955Defendant's
EvidenceCORAM: WALSH, J.THE MILLER STEAMSHIP CO. PTY. LIMITED

v.

VACUUM OIL CO. PTY. LIMITEDCALTEX OIL (AUST.) PTY. LIMITED andOVERSEAS TANKSHIPS (U.K.) LIMITED22nd February
1963R.W.MILLER & CO. PTY. LTD. v. SAME

10

THIRTEENTH DAY - FRIDAY: 22nd FEBRUARY, 1963

20

MR. MEARES: At this stage I have but two more witnesses, and I should imagine that they will finish before the morning is out. I have been trying to find Captain Olsen, the Master of the ship. I have a sheath of cables, and I think it is proper to say that the attempts that were made to get him were rather belated. It would seem, from what I can gather after cabling to England and the United States and speaking to Singapore on the phone, that he is on an island, at some sort of installation some distance out of Djakarta. Perhaps one of the most important cables was mislaid and never reached the addressee. That was a cause of delay. We have made enquiries from aeroplane services, hoping that he would be here this morning. The earliest he can be here is on Sunday morning. We have reached agreement that he should be sent out. These cables have been passing for so long that I just cannot believe that he will be here, but I do think that we have got to a reasonably crucial stage with him, and I think there is quite a fair chance of him being here, but not until Monday.

30

We would have hoped, in any event, that if we had finished the evidence today, Your Honour would have excused us from addressing immediately. We thought if we had those extra few hours, it might tend to make our addresses somewhat more coherent than starting off immediately.

40

My application is this, that I complete these two witnesses, that I do not formally close today,

Defendant's
Evidence

22nd February
1963

that addresses do not start - if Your Honour will give us this approval - until Monday; and we were anxious to know what Your Honour's practice is concerning the order of addresses.

HIS HONOUR: Do you want to say anything on this proposal about not closing the case, in the hope that Captain Olsen might be here? I am disposed to think that, apart from that, if that problem did not exist at all, it would be reasonable to accede to Mr. Meares' suggestion, that is, not to make counsel address today. But what about leaving him the chance of calling this witness if he can get him? 10

MR. ASH: I think it would be improper for me to oppose the application. If it is not Monday at 10, it is off.

MR. MEARES: I do not know what I will have to do then. It is too hard, and I will have to put myself in the Court's hands.

MR. ASH: I would like my friend's defence. That might affect the question of reply, but I do not think it will be long. I take it my friend proposes to complete his case in all respects? 20

MR. MEARES: Yes.

MR. ASH: I wondered whether Your Honour would indicate the order of addresses now.

HIS HONOUR: The view which I have usually taken is that in a common law action the ordinary practice is that the defendant addresses first, and that the ordinary practice applies to a trial without a jury, as to a trial with a jury. However, there have been some cases in which it has seemed more convenient, for various reasons, that plaintiff's counsel should address first. Does either side want to address first? 30

MR. MEARES: I do not mind where I address, but what is worrying me, if I might put it to Your Honour - is my friend's allegations of nuisance and Rylands v. Fletcher. It is obvious to me that he is going to put submissions of law to Your Honour that I cannot envisage at the moment. I can deal, of course, in my address, with nuisance in vacuo, and Rylands v. Fletcher, but I have just no idea as to how he is going to frame his submissions in nuisance, this being a branch of the law which is not very simple. 40

HIS HONOUR: I would agree with that.

Defendant's
Evidence

MR. MEARES: I do not seek any advantage at all, and no doubt if the plaintiff addresses he has a full right of reply. If it were otherwise, I could well be in the position of having to meet something I do not know and having no right of answer.

22nd February
1963

10 MR. ASH: I have endeavoured to prepare my address and I do not see how I can assist Your Honour by addressing first. I think my friend ought to address first. I can clarify my friend's mind. My friend may have different views of the law but, as I opened the matter, in nuisance I rely on the creation of a public nuisance and the plaintiff suffered special damage from it. I seek to establish the nuisance in any event, and I seek, if it becomes necessary, to get an added advantage, in that I will argue, if it becomes necessary,
20 that the direct damage test argued in the Privy Council still applies to the tort of nuisance. On the field of Rylands v. Fletcher, the principle speaks for itself - the escape of a dangerous substance from premises under the control of the defendant, to the injury of another.

HIS HONOUR: What about all these troubles and things about natural user and so forth?

30 MR. ASH: My friend can assume that I will argue all the relevant law on the point. Having stated that - and the facts are so clearly known - I think I could not make it more specific. I am particularly anxious to adhere to the ordinary order of addresses.

MR. MEARES: I do not mind going first as long as, if my friend raises something in connection with the submissions of law - and they are not easy - I can have a reply on the cases.

40 HIS HONOUR: Within reasonable limits, I shall certainly allow you to reply to what Mr. Ash says. I say within reasonable limits, having in mind that I would not want you to traverse all the facts again but, within reasonable limits, you will have a right of reply.

MR. MEARES: That removes any doubt I had.

Defendant's
Evidence

22nd February
1963

HIS HONOUR: Having said that, I will rule that defendant's counsel shall address first.

MR. ASH: On reading the transcript, in my view I can ask my friend to tender a document, to wit, the document shown to Captain Simpson, the report to the Maritime Services Board. It is still in Court, and it appears to me that, as the evidence stands, I can ask him to tender it. Perhaps he is intending to tender it, but if he is not it might involve a request to you that Captain Simpson be recalled for a further question.

10

MR. MEARES: I did not have any intention of tendering it, and I have some difficulty in understanding how I could be forced to tender it. My recollection is that Mr. Ash did not take him to the document initially; then he asked him a question as to whether he had not been informed as to what somebody said and I think it was then - I am not clear about it.

HIS HONOUR: I have not an exact recollection of it, but I think you got him to do some refreshing of recollection from the document.

20

MR. ASH: My friend's re-examination is at pp.578 and 579. In the last two questions on p.579 the contents of the report are definitely brought out, and in the last two questions he is giving what is in the report. I submit that my friend is bound to tender that.

MR. MEARES: Could I ask my friend what question he was going to ask Captain Simpson? I might be able to concede that this is the fact.

30

MR. ASH: I would like His Honour to resolve this first.

HIS HONOUR: Something is said on p.580 which, I suppose, has some bearing on the problem.

MR. ASH: I submit that the questions asked on p.579, particularly the last two, oblige my friend to tender the document.

HIS HONOUR: You do not want to tender it yourself, I take it?

40

MR. ASH: It does not really relate to my case. At the moment, I submit my friend is bound to tender it.

HIS HONOUR: Could it be left temporarily?

MR. ASH: Yes. It is out of order. The only thing is that, depending upon what Your Honour says, it may or may not be necessary to recall Captain Simpson.

Defendant's
Evidence

No.37

No.37

Evidence of D.N.G.Moss

D.N.G.Moss

22nd February
1963

DAVID NORMAN GEORGE MOSS Sworn, examined as under:-

Examination

10 MR. MEARES: Q. I think your full name is David Norman George Moss? A. Correct.

Q. You reside at 5A South Avenue, Double Bay?
A. Yes.

Q. And from 1924 to 1928 you were an apprentice on ships run by the Silver Line? A. Yes.

Q. And those ships were general cargo carriers?
A. Yes.

Q. Were they oil fuel burners or not?
A. Motor ships, diesel.

20 Q. And from 1928 till 1930 you were a third officer with the Cunard Line? A. Yes.

Q. Were the ships in which you were, coal burners or fuel oil burners? A. Oil fuel.

Q. And then from 1930 until 1961 you were engaged solely - correct me if I am wrong - on tankers? A. That is correct.

30 Q. And those tankers carried oil of many descriptions, and you became a tanker master in 1942 and from then, until you left the sea in 1961, you were master of tankers of various sizes, including one of a gross tonnage of 32,000? A. That is correct.

Q. And during the majority of the war, you remained in tankers, under the control of the Government. Is that correct? A. Yes.

Q. And since 1961, you occasionally pilot vessels and you are about to commence a new career, as a registered ships surveyor under the Port of Sydney regulations under the Sydney Harbour Trust Act? A. That is correct.

40 Q. And may I take it that, in your experience, you have had a considerable experience of carrying fuel oils and of bunkering? A. Yes.

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Examination
continued

Q. Fuel oils. I think in 1947, apart from experience you had had in bunkering ships either under your command or on which you were, you were master of the SS "Kleinella", and the "Kleinella" was carrying a full cargo of fuel oil? A. Yes.

Q. And for about three weeks you were, from her, bunkering ships at - A. Hong Kong.

Q. From the "Kleinella's" tanks, and they included passenger ships and a hospital ship, the "Jerusalemme"? A. Yes.

10

Q. I want you to assume that in 1951, the "Wagon Mound" was lying alongside Ballast Point. I think you have had these areas pointed out to you, have you not? A. Yes.

Q. And she spilt overboard a substantial quantity of fuel oil, which did not require pre-heating before bunkering, of a flash point of 170 under the Pensky-Martens test, and that this spillage was a substantial spillage, and that an idea of its quantity could be gathered from the fact that a matter of six hours roughly after the spillage, the oil was observed to have spread some 500 yards from the ship towards Goat Island, and that around about 8 o'clock on the morning of the spillage, it taking place at 4 a.m., the oil had got around Mort Bay, and particularly it seemed to be greater around the shores, around the Yeend Street Wharf, underneath the Sheerlegs Wharf and around to the head of the bay where the Morts Drydock is. You understand that. At that time, and with the knowledge of that spillage, would you, assuming you were master of the "Wagon Mound" have considered whether or not the spillage was a fire hazard? A. Definitely not.

20

30

Q. Would you have been concerned with it from any other angle? A. Oil pollution.

Q. Insofar as bunkering operations are concerned - if I may take firstly the experience on the "Kleinella" in Hong Kong - when bunkering was going on from the "Kleinella" into these passenger ships and the "Jerusalemme", were any fire precautions taken? A. None.

40

Q. As far as smoking is concerned, when fuel oil has been bunkered, what is your experience in regard to that? A. In tankers I have been in, and the company's regulations I know of, smoking is

permitted in loading fuel oil or at any time there is fuel oil on board, provided that is the only cargo.

Q. Have you been aboard the "Queen Mary"?

A. I have.

Q. Have you seen the "Queen Mary" bunkering?

A. Yes, I did on one occasion.

10 Q. On that occasion did you see whether or not, during the bunkering operations, there was smoking permitted? A. Yes. There were no special precautions taken.

20 Q. In relation to oils of greater volatility, of a flash point of 150 and under, are there precautions taken in regard to bunkering and discharging, either on tankships or on - A. Yes. It depends on the type of oil. You would not take any great precautions with a cargo of lube oil or kerosene, but anything more volatile or inflammable than that we would - no smoking except at sea, when they can smoke inside the accommodation.

30 Q. With regard to oils of greater inflammability than the fuel oil, is there any practice generally or otherwise, in regard to the galleys? A. No. There is no general practice, because it varies greatly in different ports. In some ports I have been to, where you are loading gasoline, the crew is required to live ashore. But at others you may be at moorings and you will have galley fires to cook food. It all depends on the port regulations.

Q. Have you ever known any practice, in any port, where the galley fires have to be drawn when you are loading fuel? A. Oh no.

Q. Have you seen fuel oil on waters? A. Yes.

Q. Would you tell me about the Port of Curacao? That is the French West Indies?

A. No, Dutch.

40 Q. What is the position there? A. It is entirely closed, except for a gut leading out to the sea, and it is covered on the shores.

HIS HONOUR: Q. On the shores? A. And floating around on the water, particularly at the western end, particularly where the trade winds blow it down.

Defendant's
Evidence

No. 37

D. N. G. Moss

22nd February
1963

Examination
continued

Defendant's
Evidence

No. 37

D.N.G. Moss

22nd February
1963

Examination
continued

MR. MEARES: Q. Have you seen loading and unloading of fuel oils with that oil around? A. Yes. In fact, they load gasoline and stuff like that.

Q. Without any particular precautions being taken? A. Yes.

Q. In regard to fuel oil? A. Yes. Precautions are taken according to the cargo you are loading, but with fuel oil there are none.

Q. Insofar as that port is concerned, with the black oil around, are there any shipbuilding and repair operations within its area? A. Yes, quite a lot goes on inside there. There is a drydock. Practically any re-fit of engine or hull can be carried out there. 10

Q. Even in wartime, have you ever seen a fire, of fuel oil on water? A. No, I have not.

Q. And can you imagine any circumstances under which it could happen? A. Not with fuel oil. The ship may have some more volatile cargo as well as fuel oil, and that might go on fire. You would not know whether the fuel oil was burning or not, in that case. 20

Q. Have you had any experience of oil of any sort, in bilges? A. Oh yes. There is usually a little oil in the bilges and it is pumped out before you get to port.

Q. Have you ever looked upon the fuel oil or any sludge in bilges, as being a fire hazard? A. It is not a fire hazard in itself, but we do not deliberately keep combustible material any more than we would odd pieces of wood or waste or stuff like that. We avoid it as much as possible. 30

Q. Is it the practice, generally speaking, in any ship, to pump bilges out regularly? A. Yes.

Q. But you are not allowed to pump them out in the harbour? A. No.

Q. If I may put it to you in a different way - supposing you had spilt this oil and had been concerned with it as a pollution danger, supposing your owners said, "Well, Captain Moss, you have told us all about pollution. We are up for that. Is there any fire risk"? What would you have answered? A. "None whatever." ~~They would not have asked me that.~~ (Latter part of answer objected to; struck out by direction.) 40

Q. As far as cleaning out tanks with fuel oil in them is concerned, have you had experience of that being done? A. Yes, many a time.

Q. Insofar as fuel oil tanks that have been cleaned out are concerned, are any precautions taken? A. No.

Q. Are there precautions taken in regard to oils of a lower flashpoint? A. Oh yes.

10 Q. Insofar as fuel oil tanks are concerned, is it customary to leave them for days before anybody is allowed to go inside them, or do they go inside them, if it is practicable, without delay, or what is the practice?

A. If you want to clean fuel oil tanks after discharging them, you can go into them right away.

20 HIS HONOUR: Q. What is the procedure? What do you do first and what do you do next? A. The oil is pumped ashore and then the tank is empty. If we want to clean the tank we introduce about 2 ft. of water and then turn on the steam and these days, we put down a Butterworth hose, a mechanical device which is lowered into the tank, and the hot water is turned on and the end has two nozzles on it which twist around and spray the water in all directions around the tank. We do that for anything up to 12 hours, depending on the state of the tank.

30 Q. When what do you do? A. That is pumped ashore, if you are in port. If you are in a part of the sea where pumping into the sea is allowed, you pump it into the sea.

Q. Do you send a man in to do anything further? A. Yes. They have to go into the bottom and scrape up the sludge which may be left and which will not pump out. There is quite a lot of sludge, as a rule.

40 MR. MEARES: Q. As far as fuel oil tanks are concerned, have you ever noticed, inside the tanks, after they have been opened for the purpose of cleaning, any vapours? A. No. There are no vapours. There is a smell. We have means of testing for vapour in tanks, but we do not bother with fuel oil. There is no point in it. It does not matter what part of the tank, top or bottom. It is all the same.

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Examination
continued

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Cross-
examination

CROSS-EXAMINED:

MR. ASH: Q. When you gave the opinion that the oil on the harbour on the day that was described to you, was not a fire hazard in your view, what you had in mind was, was it, that the oil was not readily ignitable? A. No. It was different to that - practically impossible to ignite it.

Q. You say it was practically impossible to ignite? A. Yes.

10

Q. And that is the basis of your opinion that it was not a fire hazard? A. Yes.

Q. I take it you would agree with me at once, that if it was ignited by a flame sufficiently long, going long enough to ignite it, then the fire could well spread over it? A. No.

Q. You do not agree with that? A. No.

Q. Do you agree with me that fuel oil, if ignited, can burn? A. Not unless the conditions are right, for example, in a furnace.

20

Q. You do not know, do you, that if a flame of sufficient size and lasting for a sufficient time is brought into contact with fuel oil of say 170 degrees flashpoint, it can ignite the oil? A. It could ignite the vapours that it causes, but it would immediately take it away. The oil will not burn on its own.

Q. It ignites the vapours. To put it precisely, you agree that you well know that if - and I stress "if" - a flame of sufficient size and going sufficiently long is brought into contact with fuel oil, it can ignite the vapours of the oil and therefore spread along the oil? You know that, don't you? A. No. The oil itself will not support the combustion.

30

Q. I beg your pardon? A. It has to be under special circumstances, in a furnace. It is blown in in a fine mist, in a hot furnace.

Q. Don't you know that if furnace oil is heated up by a flame, the flame will vaporise the oil around the flame? A. I know that if you heat furnace oil you will get a vapour, and if you ignite that vapour the vapour will immediately burn, and the oil will go out unless you keep the flame there.

40

Q. You have a flame? A. Yes.

Q. And it is not going out. It is there.
A. Yes.

Q. It is established, and it is in contact with fuel oil. Do you follow me? A. Yes.

Q. And it is going to stay alight. A. Yes.

Q. Would you agree that that would probably ignite the vapour from the fuel oil, and that then, there being a sufficient spread of oil, the fire would spread? A. No.

10

Q. You do not agree with that? A. No.

Q. Would you explain to me how it would go out? A. Immediately in the vicinity of the fire, where it was heated up sufficiently, it would give off vapour and the vapour would catch fire. You were saying the fire continues, and presumably it would create more vapour, but a few feet away there would not be any vapour being created. The heat from the fire would not spread along the oil enough, and therefore it would not create vapour and fire.

20

Q. You have a flame. You have gone this far - it will create and therefore ignite the vapour around the flame. Do you agree with that?
A. In the immediate vicinity.

Q. And having got into that immediate vicinity you would agree, would not you, that it will get into the next immediate vicinity and vaporise the oil there. That is obvious, is not it?
A. You mean that it would spread on the surface of the oil?

30

Q. Yes. A. No, I do not agree.

Q. Well, it would stay stationary. Is that your view? A. Yes.

Q. It would not spread. It would stay stationary and therefore, I suppose, gradually fizzle out? A. That is what I think.

Q. I want to be clear on this. Say this floor we are standing on was covered with furnace oil. A. Yes.

40

Q. To a depth of one-eighth of an inch or a quarter of an inch? A. Yes.

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

Defendant's
Evidence

No.37

D.N.G.Moss
22nd February
1963

Cross-
examination
continued

Q. And say the fire was established in that corner or in the middle of the room - in the middle of the room? A. Yes.

Q. A fire began and the flame was continuing and showing no signs of going out; and the fuel oil is right around it, right up to the flame. A. Yes.

Q. And all this furniture is removed; there is just the oil. You say that your knowledge is that that flame would never spread along this floor, but would go out? A. That is my opinion. 10

Q. Where have you got that opinion from?
A. Just the properties of fuel oil. I believe that if you had a bonfire and you threw a bucket of fuel oil on it, you would put the fire out.

HIS HONOUR: Q. It all depends how big the bonfire is, I suppose. A. Yes.

MR. ASH: Q. Say you had the bonfire and did not throw the oil on it. A. Yes.

Q. On a hard surface - not on the earth, where it might sink in - you pour oil all around it to a depth of one-eighth of an inch and you left it there and the bonfire kept going. A. Yes. 20

Q. That is, not throwing it over the bonfire, but next to it. A. Yes.

Q. Would the fire go out? A. Yes.

Q. Without burning the fuel oil? A. Without burning it, except what was in contact with the material burning.

Q. The oil in contact with the flame would burn, would it? A. Yes. The vapour would burn. 30

Q. Because it heated the oil next to it and vaporised it, and the vapor would burn?
A. That is correct.

Q. Well then, could not the fire, having burnt the vapour, heat a bit more vapour a bit further afield? A. No, because vapour from fuel oil is vary hard to create.

Q. But you have created it. A. Yes, but it has to burn long enough to warm up the oil alongside it. The vapour will burn off before there is sufficient created alongside it. 40

Q. Have you ever seen a fuel oil fire? A. Yes, Defendant's
I have seen it many times in the sumps in petrol- Evidence
eum fields, where they deliberately burn waste
material.

No.37

Q. Have you ever seen a substantial surface of D.N.G.Moss
fuel oil burning, on either land or water? A. No. 22nd February
1963

Q. I was interested in this because you
explained to Mr. Meares as regards the oil in
bilges - A. Yes.

Cross-
examination
continued

10 Q. - you did not consider that a fire hazard
of itself? A. Yes.

Q. You were speaking of furnace oil or fuel
oil? A. That is right.

Q. And then you added that, of course, you
avoid combustible material there as far as
possible? A. That is correct.

20 Q. Why do you do that? A. Because there is
so much combustible material in a furnace
room, including oil being fed to the furnace,
if you had a fire down there, in a confined
space like that, it might catch fire in the
bilges.

Q. That is the furnace oil? A. Whatever was
there. It might be lubricating oil. In fact,
it is much more likely to be lubricating oil
in the bilges than fuel oil.

Q. Anyhow, you avoid combustible material as
far as possible? A. Including wood, waste, and
things of that description.

30 Q. Anything combustible you avoid when there
is furnace oil about? A. No, not necessarily
when there is furnace oil about. Furnace oil
is only one thing. On a ship, you must
confine things to their proper places -

Q. You avoid combustible things and the other
things you have said where there is any petrol-
eum product around in a ship, as far as
possible? A. Yes.

40 Q. And you have very stringent precautions
on tankers, don't you? A. Yes.

Q. I am not worrying about the cigarette.
I am talking about your general fire precau-
tions. They are very stringent, are they not?
A. Very stringent.

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

Q. And one of these precautions, I take it, is that you do not have combustible material where there is any oil of any nature, as far as possible?

A. We do not have any materials, as a matter of practice. We keep the place clean. We do not leave stuff lying around.

Q. Just cleanliness? A. Men are allowed to smoke in the stokehold.

Q. Concentrate on the combustible material. You do it for cleanliness? A. Yes, and in every other way. It is unsightly. 10

Q. Tidiness? A. It is not good practice to have stuff of that nature lying around.

Q. Why is not it good practice? A. People might fall over it.

Q. Slipping? A. Lube oil lying on the grating of the stokehold, could cause a man to slide right across the stokehold. All sorts of things come into it, including fire risk.

Q. It was in connection with your own remark that you do not consider furnace oil as a fire hazard of itself, on a ship, that you said, "But of course we avoid combustible material as far as possible"? A. Yes. 20

Q. So obviously it is related to the fire hazard in some degree, is not it? A. Oh yes.

Q. You mentioned combustible material. That means something that might be set alight, does not it? A. That is right.

Q. And the reason why you mentioned it in connection with fire hazard was that if the combustible material was set alight, something might happen in the way of fire - if it was set alight? A. You mean that if something caused a fire - 30

Q. No. I mean that if the combustible material that you seek to avoid around the place in all circumstances, did become alight, then there would be a fire danger down there, would not there? A. There would be a fire.

HIS HONOUR: Q. Some danger of spread of fire? A. Yes. They used gasoline, kerosene and things for cleaning. 40

HIS HONOUR: Q. You have some other combustible material. It is set alight and there is furnace oil close to it. You are being asked whether the furnace oil being there, could aid in the spreading of a fire. A. Not to any extent. It might catch fire if the combustible materials burnt in the immediate vicinity, but one of the other dangers is that it creates a lot of smoke and therefore makes it much more difficult to fight a fire.

10

MR. ASH: Q. You say it would spread to some extent? A. Yes. Supposing there was a fire at one end of the bilge where there was fuel oil on the surface, and the fuel oil immediately in the vicinity could fire, it would not spread along the bilge, in my opinion.

Q. It would give you the utmost concern, as a ship's master? A. Yes.

20

Q. Because of the possibility of the spread of fire? A. Because of the possibility of not being able to get to it to put it out, mainly.

Q. If the fire was going to be contained in its own small area, it would not matter whether you put it out or not? A. If you do not get to a fire and it spread to other things, it is going to cause a bigger fire. There are other things besides fuel oil in the bilge. You started off by saying fuel oil in a bilge. We do not have fuel oil anywhere else, and there is very little in the bilge. It is easier for it to spread through the lubricating oil on the plates.

30

Q. If you saw combustible material alight, adjacent to fuel oil, in any lower part of your ship at all, you would be highly concerned? A. Yes.

Q. And you would be highly concerned because of the spread of fire? A. Yes.

40

Q. Fire at sea is a matter that is constantly in any captain's mind, is not it? A. Yes.

Q. And that is obviously why you take, on a ship, these careful routine stringent precautions? A. Yes.

Q. And they are particularly important on a tanker? A. Yes.

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

Q. So you do concede the possibility of a fire being established by some combustible material in contact with furnace oil, spreading a little?

A. Yes.

Q. You do concede that? A. In those circumstances.

Q. Let us come out into the open, on deck. If it was spread around the deck and, by some means, some combustible material was ignited on the deck and there was still oil spread all over the deck - I am speaking of fuel oil unless I change it -

A. Yes.

10

Q. You are not going to suggest you would not be concerned? A. No. I would be concerned to put the fire out as quickly as possible.

Q. Why? A. Paintwork on the deck is much more easily set alight than fuel oil. Paintwork will exude vapour.

Q. On a rusty boat which had been neglected -
A. I do not believe the fire would spread if the deck were covered with say one-eighth of an inch of fuel oil and you had a fire on one part of it, it would not spread unless it were a very hot day and the steel deck were heated - which is quite conceivable - to 150, and then you might be creating vapour all over and get a fire all over, but even then I doubt it, because the fuel oil creates a certain amount of soot and covers it over, and I do not know.

20

Q. But you would be up there like a flash, to put it out? A. Yes.

30

Q. And you think, up there, just as down below, it would spread a little bit? A. No.

Q. You do not think that combustible material that is now alight, that I put to you, would heat up any vapour at all on the adjacent fuel oil? A. It might on the adjacent fuel, but in the open air you have currents of breeze blowing the vapour away and that sort of thing. You have cooling effects on the oil. It is not in a confined space any longer. I know on ships, the difficulties engineers have in lighting fuel oil sometimes. In fact, on modern ships they start it off with diesel oil.

40

Q. Have you been a ship's engineer at any stage?
A. No, but I had to take an interest in it.

Q. When you were at Hong Kong, was any of the oil spilt? A. No. I cannot remember it.

Defendant's
Evidence

Q. Has your ship ever spilt fuel oil on the harbour? A. Oh no.

No.37

Q. Have you ever spilt it so that it would extend 500 yards from the ship on one side? A. No.

D.N.G.Moss

22nd February
1963

10 Q. You would agree, to cut it short, that that is a colossal spillage? A. Yes, it would be.

Cross-
examination
continued

Q. Can you envisage fuel oil lying on any surface at all, catching fire under any circumstances? A. As I say, if you had fuel oil on a steel surface which was heated up -

20 Q. A heated steel surface? A. Yes. You have to have something which will conduct heat underneath the oil. The oil itself is not a good conductor. The oil has to be heated to 150 degrees before you have any chance at all of firing the surface and the heat underneath has to be maintained.

Q. What training or experience prompts you to give that opinion? A. Well, I have taken an interest in various things on the ship. I have seen them light the boiler fires on many occasions.

Q. You have seen the furnace lit down below? A. Yes.

30 Q. But what training or experience prompts you to say that fuel oil would only light on a surface if heated, in your view, to 150 degrees? A. Well, I do not say 150. It depends entirely on the type of fuel oil. It might be a much greater temperature than that. It certainly would not be less, or very little less.

Q. What training or experience prompts you to say that fuel oil of not less than 150 degrees is the only one that will ignite?

40 MR. MEARES: He has not said that.

MR. ASH: Q. As I understand it, you expressed an opinion that fuel oil lying on a surface would not ignite unless, by a steel deck or other heating agent, it was at 150 degrees? A. That is my opinion, yes.

Defendant's
Evidence

No.37

D.N.G. Moss

22nd February
1963

Cross-
examination
continued

Q. What training or experience enables you to express that opinion? A. The very fact of the flash point test itself demonstrates that. You have to heat the oil to a certain temperature, and it is giving off vapour, in the presence of air. You try to ignite it and it ignites.

Q. Are you talking about ignition by a match? A. Some means of ignition. I do not think they use a match in a laboratory.

Q. In a laboratory? A. To ascertain the flash point, which they do with all cargoes carried on tankers. 10

Q. Let us forget flash points for a moment. Let us assume that the furnace oil we are speaking of has a flash point of 170, but having stated that fact let us forget it. A. All right.

Q. The flash point - (Objected to; objection withdrawn).

Q. Let us take fuel oil of 170 degrees flash point? A. Yes. 20

Q. We know it is 170 degrees and we do not have to go into the laboratory or test it or do anything with it. Do you follow? A. Yes.

Q. Let us not discuss flash point in relation to this question. A. Yes.

Q. A quantity of that fuel oil is lying on a surface. Do you follow me? A. Yes.

Q. And you have expressed the opinion that it cannot be ignited unless heated to 150 degrees or more. That is the opinion you have expressed? A. You said the flash point was 170, so I will make it 170. 30

Q. So in that example, you could not ignite it until it was 170? A. Yes.

Q. That is a matter of ordinary scientific knowledge, is not it? A. It is a matter of mind.

Q. Do you know, for instance, an ordinary match flame has a temperature far higher than 170? A. Yes.

Q. I am talking about the temperature of ignition agents. A. Yes. 40

Q. When you said that that cannot be ignited, what ignition agent had you in mind, a match? A. No.

Q. What had you in mind? A. A bundle of waste soaked in kerosene, soaked in heated furnace oil. These are the things I know about. I would not try to set fuel oil alight in the open. I have seen the difficulties engineers on ships have in trying to light it.

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

10 Q. When did you see fuel oil, on a ship attempted to be ignited in the open? A. I never have, but I assume that it is more difficult than it is under the proper conditions.

20 HIS HONOUR: Q. More difficult than in what conditions? A. On a ship, when they light boiler fires, at least in the modern ships - and it was more difficult in the older ships - first of all they start the furnace with diesel oil, which is heated and sprayed in under pressure. It is sprayed in a very fine mist. They have a torch, which is a bundle of rags on some twisted wire or a rod. They light that, stick it into the furnace, turn on the fuel, which sprays in the mist and it lights up. After the furnace is sufficiently warmed up, they turn over to fuel oil and the fuel oil will catch fire in this fine mist form.

30 Q. You think it would be more difficult to ignite it in the open air than in the furnace? A. Much more difficult.

Q. But are we not talking about quite different things? In the furnace I imagine you are not seeking to ignite say a layer of one-quarter of an inch or one-eighth of an inch thickness, spread on something else, are you? A. No.

40 Q. Would not you agree there is some difference in the problem? A. The only thing I would agree is that it is much more difficult to light a layer, by getting it to catch fire, than the fine spray.

MR. ASH: Q. All I ask you is, if you succeed in lighting it, won't you agree with me, to cut it short, that then there is a fire danger - if you have your igniting done, if you get over that stage, then there is a fire danger from the presence of the fuel oil? Surely that is the position, is not it? A. A danger of it spreading?

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

Q. Yes. A. I would not think so.

Q. Let us get away entirely from furnace oil for the moment. I take it you have heard, unfortunately, over your years, of many wharf and pier fires in a harbour? A. Yes.

Q. I mean started by a number of circumstances?
A. I have not heard of many.

Q. But you do know they happen? A. I have heard of them happening, yes.

Q. And happening in harbours in various places, particularly where there are industrial operations going on? A. Yes. 10

Q. Will you agree with me that if a fire started on a wharf, say a few hundred feet long, so that the wharf got on fire, to a spreading extent -
A. Spreading along the wharf?

Q. Yes. Take that fact - established. You would agree with me that if, in addition to that fact, there was underneath the wharf a fairly thick layer of oil on the water, and assuming it was, say, half-tide, on the foreshores, through the falling tide - do you follow? A. Yes. 20

Q. And on the piers, through the falling tide - the presence of that oil would greatly increase the risk of the spread of the fire? You would agree with that, would not you? A. I do not know. I suppose that the oil would be among debris and that sort of thing.

Q. Why do you assume that? A. Well, it is usual in a place like that. 30

Q. To have debris, is it? A. In Curacao the shores are littered with debris covered with oil, black oil.

Q. All sorts of debris? A. Yes.

Q. Waste and that sort of stuff? A. I do not know about waste. I suppose that would sink, but anything that will float is washed up in the corner.

Q. No combustible material, I suppose, is there?
A. It is all combustible. 40

Q. To get back - I interrupted - you got to the stage where you said there would be oil-soaked debris under the wharf? A. Yes.

Q. Don't you think that oil spread around the water, foreshores and piles would, with a fire on the wharf, be likely to lead to a rapid spread of the fire? You started to answer -
 A. I am trying to see the circumstances. If the debris were water-soaked, I doubt that it would spread very rapidly.

10 Q. Debris? A. I am assuming there is a foreshore littered with all this rubbish which usually collects in a place like that.

HIS HONOUR: Q. Let us suppose, for the moment, there is no debris. A. And just the foreshore with an oil layer on it?

20 MR. ASH: Q. On the water, extending say 500 yards - on the water under the wharf, say 30 or 40 feet back to the land - and the piles coated within the limits of the tide rise - and no debris? A. I would myself say that the piles would burn down to where they were thoroughly wet and then the fire would go out. I could not visualise it spreading over the fuel oil, burning the fuel oil out from the burning wharf.

Q. Do you think the presence of oil under the wharf, on the foreshore and on the piles, for that length, and that width of the wharf, would accelerate the spread of the fire already on the wharf? A. No.

30 Q. Do you think it would have any effect on its spread whatever? A. No.

Q. We will take it step by step. You do not think the oil on the foreshores will have any effect at all? A. No, not on the spread of the fire, away from the wharf.

Q. Say a piece of burning wood or a plank off the wharf, or some other thing, dropped in the oil on the foreshore? A. Yes.

Q. And stayed alight. A. Yes.

40 Q. Burning quite vigorously - do you think that would have any effect on it? A. No.

Q. Say a flaming object fell on a large bit of debris floating on the oil on the water, and remained flaming and spread to the limit of the object, and came in contact with the oil on the water, about an eighth of an inch thick - no effect? A. No.

Defendant's
Evidence

No.37
D.N.G.Moss

22nd February
1963

Cross-
examination
continued

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

Q. I take it as the fire came down to the oil-covered piles, the oil-covered piles would have no effect? A. I think it would go out when it reached the point where the piles were sufficiently damp not to be very combustible.

Q. You do not think the presence of an oil slick on the piles would make any difference at all?

A. It would burn where the wood was dry, but once the fire got down to where the wood was wet, I do not think it would. I have had no experience of wharf fires. I have seen it once, but not directly a matter concerning me. 10

Q. You have had no experience of wharf fires or, I take it, of harbour fires? A. Yes, I have seen a harbour fire. I was in Curacao when there was about 100,000 tons of inflammable stuff which went up, but that did not cause any concern in regard to the harbour. One section of the harbour was cordoned off with a row of barges in case burning material got on to the water, to prevent its spreading to the main part of the harbour but in actual fact, they confined it. 20

Q. Why did they want to prevent it spreading to the main part of the harbour? A. There were ships, dockyards and wharves.

HIS HONOUR: Q. Where was this fire? A. On-shore, Curacao, 1936 or so.

MR. ASH: Q. Have you ever seen a fire burning on water, caused by any petroleum product, in your experience? A. Yes. I saw one in Singapore once. That was gasoline too. That was due to a small local craft pumping, washing it overboard, and they caught fire from a cooking fire on a tongkang lying astern. 30

Q. What is a tongkang? A. It is a Chinese junk, you might call it, a barge shaped in the peculiar way they have there.

Q. There was a cooking utensil on that? A. They have an earthenware stand in which they build a little wood fire on which they cook their food. 40

Q. It was on the deck? A. Yes.

Q. How did the oil catch fire? A. It was gasoline. It drifted down on the tide, and the vapour caught fire.

Q. As you said earlier, a fire adjacent to fuel oil can ignite the vapour around it to some extent? A. But this was a terrific lot of vapour.

Q. Getting back to a much less inflammable liquid like fuel oil, you conceded the fire can light it to some extent? A. Yes, the vapour.

10 Q. That is what happened in Singapore - a different product A. Yes, highly inflammable. It requires less, of course, to create the vapour and keep the vapour going.

Q. You did not see any oil fires during the war? A. To do with ships, yes I did.

Q. On the water? A. Yes.

Q. Did you see furnace oil burning on the water? A. Yes.

20 Q. All the fires you have seen have been gasoline or kerosene? A. Highly inflammable stuff - aviation spirit.

Q. Do you do any welding on a tanker? A. No.

Q. Is there any need for it? A. No, not unless we are re-fitting in drydock, and we do not do it.

Q. Are you familiar with the process of welding? A. Yes.

30 Q. Then you would know that these globules of molten metal can spread quite a distance, up to 30 ft. or more? A. There is not very much spatter of metal with welding.

Q. What about oxy cutting? A. With oxy cutting there is a bit more, depending on the object and -

Q. You would agree with me that you know that those things can ignite combustible material? A. Yes. I have seen them fall on wood and you see the charred spot where they have fallen.

Q. Have you ever seen them fall on material like waste or hessian or paper? A. No.

40 Q. You would assume they would burn? A. I would assume they would smoulder.

Q. And start a flame in that object, at least to its limits? A. It might. They probably would, when they were hot.

Defendant's
Evidence

No. 37

D.N.G. Moss

22nd February
1963

Cross-
examination
continued

Defendant's
Evidence

No. 37.

D.N.G. Moss

22nd February
1963

Cross-
examination
continued

Q. There is a probability? A. Yes.

Q. The first thing you would expect to be going on on a ship repair wharf or dock, would be some welding? A. Yes.

Q. And oxy cutting? A. Yes.

Q. And if there was any combustible material on the wharf, they could start a fire on the wharf? A. Yes.

Q. And in your view, if that fire started that way, which you put in the realm of something which might happen there, it would not make any difference whether the position under that wharf was that there was no oil or a substantial quantity of furnace oil, no difference at all? A. I did not say quite that. I said that where the oil was in contact with the dry piles, then the oil might burn - it would burn, but when the flame got down to the wet part of the pile presumably the flame would tend to go out. Even if there were no oil there it would go out. The oil would make no difference.

10

20

Q. If you came around in a boat, a launch, and you saw a wharf fire ignite that oil, about one-eighth of an inch under it, all over it, on the piles and on the foreshores, you would be alarmed, would not you? A. About the wharf burning?

Q. Would you be alarmed that there might be a spread of the fire? A. No.

Q. You would have the same view if you saw no oil in the vicinity at all, as you would if you saw that oil there? A. Yes.

30

Q. Not a bit of difference? A. No difference. There would be no difference in the spread of fire on the water, whether there was fuel oil there or not. It would look bad. Fuel oil always looks terrible.

Q. And you say that, notwithstanding your experience as the captain of a tanker? A. Yes.

Q. Notwithstanding the stringent fire precautions you have taken at all times in tankers? A. We do not take such stringent precautions when the ship is loaded with fuel oil.

40

Q. They are allowed to keep their cigarettes alight. You have told us that. Notwithstanding the stringent fire precautions you take on a tanker, and notwithstanding the fact that if you saw a fire

started on your ship, you would be highly concerned, you would not be the slightest bit concerned if you saw that lying on a wharf, on the piles and on the foreshores? A. No.

Q. Have you ever seen oil of this intensity, as described by Mr. Meares, in any harbour?
A. Not 500 feet from the ship, covering the whole bay.

Q. 500 yards. A. 500 yards.

10 Q. Floating around under the wharf and into a busy industrial area? You have never seen anything like that? A. No, but I do not see how that is going to affect my view on the fire hazard.

Q. The quantity of oil has no effect, you say?
A. No. It is all the same oil.

Q. You realise the more oil spilt the further it spreads? A. Yes.

20 Q. And the further it spreads the further the number of properties and industrial establishments it comes in front of? A. Yes.

Q. Yet you say whatever the property, whatever the industrial operation, it does not matter from the point of view of fire hazard?
A. That is what I say.

Q. Nothing at all, and you are quite serious in that opinion? A. Yes.

(Short adjournment).

30 MR. MEARES: I ask leave to file the particulars of defence. (Handed to His Honour).

40 MR. ASH: Q. I want to ask you some questions about your views on this oil. Would you agree with this statement, under the heading of "The control of floating oil" - "There seems always to be present some risk of laden oiltankers moving in restricted waters being involved in collision and of oil in large quantities being, in consequence, released to the sea. Once there it will rapidly spread on the surface of its own accord and will also be carried by wind and tide to other parts of the port area." Do you agree with that? A. Yes.

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

Defendant's
Evidence

No. 37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

Q. "The fire hazard it there presents is both obvious and great." Do you agree with that?
A. Depending on the oil you are talking about.

HIS HONOUR: Q. You would not agree with it in relation to furnace oil? A. No, I would not.

Q. Not to all of it; you would not agree to all of what has been read out? A. No. I would not agree to it as a generalisation.

MR. ASH: Q. Would you agree with this, under the heading of "Bunkering and transferring bunkers" - and I take it you would agree with me that that relates to furnace oil? A. It might, yes.

10

Q. Probably would? A. No, not probably.

Q. Do you bunker with petrol? A. No, but you bunker with dieseline. There are many motor ships these days.

Q. Dieselene or higher flash point bunker oils? A. Yes, lower flash than fuel oil.

HIS HONOUR: Q. Do you know how dieselene compares with the oil we have been talking about here, as to flash point? A. No, not offhand, but I think it has a lower flash point.

20

MR. ASH: Q. You used no other bunker oils then - A. Kerosene, even gasoline on the smaller ships.

Q. Let us confine it to the bigger ships? A. No. As far as I know, there is no gasoline used as bunkers on big ships.

Q. Or kerosene? A. No. I do not know any big ships using kerosene.

Q. Would you agree with this, assuming we are speaking of fuel oils of a higher flash point, "It is surprising how many accidents occur during these operations" - that is, of bunkering and transferring bunkers? Do you follow? A. Yes.

30

Q. "Mainly due to tanks overflowing or to excessive pressure being induced into the filling line. Before bunkering or transferring bunkers, be sure that any excess fuel can overflow safely into another storage tank in which there is sufficient reserve capacity." Do you agree with that? A. No, because in many cases there are no extra tanks and the overflows are arranged through goosenecks onto the deck.

40

Q. I particularly refer to the first sentence- "It is surprising how many accidents occur during these operations of bunkering." I should further tell you that that extract is in a chapter of a book dealing with safety precautions, and the other matters concerned in that chapter are matches, petrol lighters, electric lighters, torches, oil lamps, boilers, fire extinguishers and such things? A. Yes.

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

10 Q. And therefore relates to safety precautions against fire? A. Yes.

Q. Would you agree with that statement, that it is surprising how many accidents occur during these operations, that accidents involving fire risk occur during bunkering operations? A. Not with fuel oil.

Q. Do you know a book on "Oil Bunker Cargoes" by John Lamb, published 1954? A. Yes.

20 Q. If I tell you that statement is contained in that chapter of safety precautions - "It is surprising how many accidents occur during these operations of bunkering and transferring bunkers" - A. I knew Mr. Lamb personally, as a matter of fact. He was a very cautious man. He had much less sea experience. He was an engineer, and the accident I think he means is overflowing the tank.

30 MR. ASH: Q. That is what is referred to as bunkering and transferring. It is surprising how many accidents occur? A. Yes.

Q. Then take the reverse, the oil tanker cargoes? A. Yes.

Q. The safety precautions in that regard dealt with in that chapter, deals with electric fans and radiators, rubbish, tankering and transferring of bunkers, oilers, fire extinguishers? A. Yes.

40 Q. Would you agree it could be talking about fire safety? A. No. I doubt very much if he had ever heard of a fire caused by a bunker during the course of - -

Q. You think that refers more only to overflowing? A. That is so.

Q. And in that regard is dealing with fire precautions? A. Yes.

Defendant's
Evidence

No. 37

D.N.G. Moss
22nd February
1963

Cross-
examination
continued

Q. The other paragraph is dealing with the possibility of fires? A. Yes.

Q. You take the view that one might isolate the possibility of fire? A. Yes.

Q. That isolated instance refers only to the possibility of fire? A. Yes.

Q. Do you agree with this: that special care must be taken to prevent sparks or hot metal particles coming into contact with mineral oil on water surfaces, particularly in the vicinity of a vessel? A. Mineral oil? There are all kinds of oils that are inflammable, and I would not care to agree that there was any possibility at all from its falling on to the surface. 10

Q. Fuel oil, so far as you are concerned, is as safe from inflammability as water? A. Yes.

Q. You would agree, anyhow, that mineral oil covers and includes fuel oil? A. Yes.

Q. Are you familiar with the port of Sydney regulations? A. No, I have not obtained those. 20

Q. Would you think that that was an unnecessary precaution as regards fuel oil - "that care should be taken to prevent sparks coming into contact with mineral oil on water surfaces"? A. Yes.

Q. Quite unnecessary? A. Yes, except for the fact that you have got to be careful. You have got to instil caution with all these things. If you get used to ships putting out soot or throwing cigarettes over the side on a black oil ship, they will go on board a white oil ship and do the same thing, with the possibility of disastrous consequences. You have got to make them careful on all occasions. It is a matter of habit. 30

Q. Do you agree that a fire hazard in respect of oil on a tanker rises sharply when you enter port? A. Fire hazard on a tanker entering port with a cargo of fuel oil is no greater than with a general cargo on the ship.

Q. Confined to the tanker, is it greater in port than at sea? A. I would say it probably is, because you get strangers coming on board and they may not know the fire regulations. They may start dropping cigarettes all over the place, in cabins and so on; in that respect. 40

Q. As regards oil spillage, is it greater at sea than in port? A. You mean the fire hazard?

Q. Yes. A. I do not really doubt you can be safe, you can be safe one minute at sea and then you have a collision and you are not safe.

Q. Let us take a situation with no collision. A. Then there is no fire hazard at sea.

Q. None in the harbour? A. None in the harbour with fuel oil. No greater at sea than in port.

Q. And no less? A. And no less.

HIS HONOUR: They are both nil.

MR. ASH: Q. They are both nil? A. You can have a collision in the harbour and you can have one at sea. You can have one, with a fire occurring from carelessness and you can have the same thing happening in port by someone coming on board.

Q. You do not attach any importance to the fact of being in port with industrial installations and port activities going on? A. None at all.

Q. You agree that the hazard is raised still further if ship repairing is going on and welding is in use? A. On board the ship?

Q. Yes. Do you agree with that? A. With regard to fuel oil, with the hatches open? No, I do not agree with it.

Q. Do you agree that there are fire hazard conditions found in existing piers constructed with open-wooded piling sub-structures? A. Oh yes, I suppose there are.

Q. Speaking of pier and wharf fires, do you agree that there are other features of piers which have resulted in constantly high losses, with failure to provide fire stops in the large areas, with the lack of access to the sub-structures for fire extinguishment, delayed detection of fires in concealed areas, the use of combustible materials in decking and the construction of those structures, with the exposure of fire hazards, including ship's fires, floating oil - do you agree with that? A. There again, it depends on the oil. I would not consider that fuel oil was oil with that degree of hazard.

Defendant's
Evidence

No. 37

D.N.G. Moss

22nd February
1963

Cross-
examination
continued

Defendant's
Evidence

No.37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

Q. That extract is from the National Fire Prevention Association International, do you know that publication? A. No, I do not.

Q. You agree with it all except in respect of fuel oil? A. That is right.

Q. Let me get on to another matter. When you come into port you carry a chart, do you not? A. Yes.

Q. And that chart usually shows the bays, of course, and any wharves in the bay? A. Yes. 10

Q. And you would assume, as Master of a ship, that when you see that on the chart, wharves and docks, that ship repairing operations would be going on; would you not? A. Assuming that was an area where they carried out that work, yes.

HIS HONOUR: Q. I think you are being asked if you saw on a chart an indication that there was a dock yard you would assume that in that area there would be ship repairing work going on? A. Yes. 20

MR. ASH: Q. Having assumed that, you would assume therefore that welding and oxy-cutting operations would probably be going on? A. Yes.

MR. ASH: My learned friend was referring to a document "Coastguard" - -

MR. MEARES: I have not got it here. It is in my chambers.

MR. ASH: Q. Have you changed your views at all on any aspect of this matter between 1951 and 1963? A. No sir. 30

Q. They are the views you have always held? A. Yes, not always; since I have had enough experience to know.

Q. I think you will agree with me that, as Master, a Chief Engineer and the engineer officers are very much concerned with bunkering? A. Yes.

Q. And with the knowledge of quantities and the characteristics of oil? A. I doubt very much whether any chief engineer knows more than the Master about the characteristics of the oil he uses. 40

Q. You would not expect the chief engineer to know more about bunkering and fuel oils than the Master; is that right? A. I think of the characteristics of oil he has some information on the bunker sheets, which are seen by the Master. They are signed by both the chief engineer and the Master, they have the flash-point, the viscosity, so the Master has the same information as the chief engineer, but the chief knows more about using it.

10

Q. And about its dangers? A. No. He would not know anything more about the dangers than the Master.

Q. The chief engineer's knowledge of this would really not exceed that of the Master's in any way; his knowledge of the use of fuel oils and the bunkering of them would not exceed the Master's at any time? A. The use of them, maybe; the bunkering, no.

20

Q. What do you mean by the bunkering, just putting them in? A. Yes, dipping for quantities, checking the bunkers.

Q. You have never found the chief engineer to know more about the particular state of oils, in your experience, have you? A. No.

Q. Does the chief engineer go into the engine room at all? A. Yes.

Q. I suppose the Master would go in just as much, would he? A. On the tankers I have been on it is the Master's duty to inspect the engine room and the stokehold weekly.

30

Q. And any chief engineer would know - - (Objected to).

Q. Would it be unlikely that the chief engineer would know more about the danger of fuel oil than you do? A. No. He would be less conscious of the dangers than the Master, because the Master is the final one who is responsible for what happens on the ship.

40

Q. And no responsibility attaches to the chief engineer at all, is that right? A. Only to the Master. The Master is responsible to the outside authorities.

Defendant's
Evidence

No. 37

D.N.G.Moss

22nd February
1963

Cross-
examination
continued

Defendant's
Evidence

No.37

D.N.G.Moss
22nd February
1963

Cross-
examination
continued
Re-examination

Q. In your experience the Master has never asked the chief engineer for any information about fuel?
A. He might.

Q. It really would not be necessary, would it?
A. It would depend. For example, the chief might be heating up the bunkers to burn, or something like that, and the Master might want to know what temperature he is going to heat them to.

RE-EXAMINED:

MR. MEARES: Q. You did make some reference to an experience you had had of getting rid of sumps in petroleum fields. Do you recall that? A. Yes.

10

Q. What is a sump in a petroleum field? A. It is a ditch into which they put natural things like the bitumen and the lost products from the refining of crude oil, for which they have no market, it is just rubbish that they cannot sell. They put it in the sump and they put a little more inflammable oil like kerosene or petrol or something of that sort in it and set it going. Then it burns continuously. It is confined to the hole dug into the ground. You see them on most oilfields.

20

(Witness retired).

No.38

R.H.Wakeford
22nd February
1963
Examination

No.38

Evidence of R.H.Wakeford

RONALD HAROLD WAKEFORD Sworn, examined as under:

MR. MEARES: Q. Is your name Ronald Harold Wakeford and do you live at 32 Burley Avenue, Caringbah?
A. Yes.

(Witness stood down).

30

No.39

D.N.G.Moss
Recalled
22nd February
1963
Examination

No.39

Evidence of D.N.G.Moss (recalled)

CAPTAIN MOSS, recalled:

MR. MEARES: Q. I wanted to ask you this question: You have seen my junior, my solicitor and myself about this matter in my chambers, have you not?
A. Yes.

Q. I do not think I told you what we thought was the probable cause of the Morts' Dock fire? A.No.

Q. And you do not know from any other source?
A. No, I do not know the name - -

40

(Witness retired).

No.40Evidence of R.H.Wakeford (recalled)Defendant's
EvidenceNo.40

CAPTAIN WAKEFORD, recalled:

R.H.Wakeford
Recalled

MR. MEARES: Q. I think you are presently the Captain of the "H.C.Sleigh," which is a tanker of some 27,000 tons? A. Yes.

22nd February
1963

Q. Your sea experience has been that you in 1935 started being trained at H.M.S.Worcester? A. Yes.

Examination

Q. Is that an installation or a ship? A. It is a ship.

Q. Between 1937 and 1939 you were apprenticed with the Blue Funnel Line in ships and were, with one exception, on oil burners? A. Yes.

Q. Then from 1939 to 1945 you were with the Royal Navy? A. Yes.

Q. With the rank of midshipman, to commissioned rank, in various types of warships; all of which were oil burners? A. Yes.

Q. From 1945 to 1951, the war having finished, you went back to cargo vessels which were diesel-driven? A. Yes.

Q. From 1951 until this date you have been in tankers? A. Yes.

Q. Carrying various types of fuel. Might I ask you as to whether or not you have had a substantial experience of the bunkering of fuel oil? A. I have.

Q. And of the discharge of fuel oil? A. Yes.

Q. And are you aware of the fact that fuel oil has a flashpoint which is variable? A. Yes.

Q. In your opinion what is the range of the flashpoint of the fuel oil which is usually used in bunkering? A. Bunkering, about 170 fahrenheit, fuel oil, and then it goes down in gasoline or kerosene to about 50. For crude oil it is of course atmospheric temperature.

Q. Are you aware of how the flashpoint is achieved? A. Yes.

Q. And the difference between the flashpoint and the fire point? A. Yes.

Defendant's
Evidence

No. 40

R.H. Wakeford
Recalled

22nd February
1963

Examination
continued

Q. Have you had experience of bunkering of cargo vessels and warships and also tankers? A. Yes.

Q. Have you also had experience of bunker oil tanks being cleaned out? A. Yes.

Q. Have you also had an experience of a fire by explosion at sea in 1941? A. Yes.

Q. And that explosion took place in what fashion?

A. I was on the destroyer and there were other destroyers with us and we were laying mines in the North Sea when we ran into a German minefield ourselves. Unfortunately the damage was done and my ship actually had the bows blown off. The other ship hit a mine and the mine ignited the paint (sic) locker which caused the explosion, and the fuel oil from our fuel oil tanks being on the water - spread over the water - meant that when she came alongside to start to take off survivors, we found we were still floating when she was about 20 yards away, and she ran into a mine when she was about 20 yards away and the explosion caused the fire on the water with the oil. 10 20

Q. I want you to imagine a substantial spillage of fuel oil in Sydney Harbour, with a flashpoint of 170 degrees, a viscosity that did not require pre-heating, at Ballast Point; from a ship, and also the spreading of that oil within a space of no less than four hours over a very substantial distance, which has been described by one witness as 500 yards. Additionally, in that time some of the oil went around into Morts Bay. You know that area, do you? A. Yes. 30

Q. And the installations there? Under the Sheer-legs Wharf and along the Yeend Street Wharf and further towards the head of the bay until it got right to the dry dock there and possibly a little bit past it. From that one must assume that the whole of the spillage of the fuel oil must have been quite substantial.

In the first place, if this had been done under your control would you have been concerned from the point of view of any type of damage? A. Oh yes, I would be very concerned about the position of the area in question. 40

Q. What would you do about pollution? A. Report it to the Harbour Master. If it is a substantial amount I could not do much about it. If it is a small amount you can put a boom around and collect

it up but if it is a substantial amount that you are issuing you cannot do much about it. It would be far too big to collect up.

Q. Insofar as fire danger or risk is concerned, would you have considered that the spillage would in any way be a fire danger?
A. No, definitely not.

10 Q. Insofar as questions such as these are concerned, would it be the Master's responsibility? A. All of it is the Master's responsibility; everything that happens.

20 Q. In relation to the bunkering of fuel oil, would you tell us your experience in regard to any safety precautions and compare them with safety precautions in regard to any other oils, if there is any difference? A. No. I would use safety precautions the same as with other oils, actually. It is the practice to get the crew safety conscious, regardless of what type of oil is carried.

30 With regard to other safety precautions such as no smoking (that is obvious), the blocking up of scuppers on the ship's deck so that it does not go over the ship's side. In some of the ports you have to even damp the galley fires, and in some ports you are not allowed to smoke on the ship, you have got to go to a rest room on the jetty. But normally in the majority of ports you can smoke inside cabins and enclosed spaces.

Q. Is there any difference in your experience in any ports in relation to the loading of fuel oil compared with other oils? A. No, not really; not in oil ports.

40 As far as bunkering in cargo ships is concerned, that is a different matter. There are no precautions whatever taken normally. There would be smoking up on deck while ships are bunkering. It is only on the bunkers that there is no smoking and extra precautions because - as I said before - it relates to safety training and the ship's discipline.

Q. Insofar as in cargo ships or elsewhere is concerned, is it a reasonable thing today to load bunker oils through open hatches? A. Yes, you can do that.

Defendant's
Evidence

No.40

R.H.Wakeford
Recalled

22nd February
1963

Examination
continued

Defendant's
Evidence

No.40

R.H.Wakeford
Recalled

22nd February
1963

Examination
continued

Q. In regard to oil tanks being cleaned, have you had any experience as to whether any safety precautions are taken with that or otherwise?

A. So far as fuel oil is concerned I have cleaned out tanks preparatory to dry docking, and on one occasion there was a bit of sludge on the bottom. The chemist comes around and inspects all bunkers before they go into dry dock. He gave me a clearance. That is, a "Men at Work" clearance. That means that the men can go down and do welding inside the tanks. In that particular tank there was some sludge which was fuel oil sludge, mixed with rust, in the corner. The workmen were still doing the welding. There was no chance of catching fire at that stage.

10

Q. So far as fuel oil tanks are concerned, or anywhere that fuel oil is controlled, do you get any vapours from it until it gets to a certain point? A. No. You can go down into a fuel oil tank as soon as it is discharged, except for it being dirty. There is a bit of a smell but no toxic - -

20

Q. Is that quite different to the case of the more volatile - - A. Yes, my gosh, yes. You could not go down a gasoline tank.

Q. Have you ever seen fuel lit up? A. Only in that case I mentioned.

Cross-
examination

CROSS-EXAMINED:

MR. ASH: Q. I did not hear what you were saying about the war incident. The fuel oil got on the water after the collision? A. Yes. Actually it was diesel oil.

30

Q. That is a form of fuel oil? A. Yes, it is heavy oil.

Q. What was it that started that burning?
A. The mine exploded.

Q. And then following that the fuel oil became ignited and burnt over the water? A. Yes, a certain amount of it.

Q. This was out in the middle of the ocean?
A. Yes, in the North Sea. It dissipated pretty quickly.

40

Q. Owing to the waves? A. Yes.

Q. But some of it was still burnt? A. Yes, it did.

Q. So you had seen then the fact that fuel oil, or dieselene oil - to be precise - would burn on the Atlantic Ocean if ignited? A. Yes, in a large quantity.

Q. Then, I suppose that being something you had actually seen, the fact that it burnt did not surprise you, did it? A. To a certain extent. But at that time I was not taking much notice.

10 Q. No, I can understand. At all events you knew this: In sufficient quantities and if ignited, of course, fuel oil would burn on water? A. Yes, for a short time.

Q. So long as it was there to burn. Until it was broken up, I will put it that way. You knew that? A. Yes.

20 Q. So it necessarily follows, if I go and release a lot of fuel oil in the harbour and if it does become alight or lit up it will burn? A. Yes, but I do not really think - I cannot say how it could become lit up. The thing is that this was caused by an explosion, the explosion causing so much heat.

Q. What happened there was the thing that set it off was the explosion? A. Yes.

Q. That caused enough heat to light the fuel? A. Yes, to ignite it.

30 Q. I appreciate that. I am putting it to you on that basis. You would know if fuel oil was ignited - - A. If you see it? How do you mean?

Q. The "if" is used in a conditional way. Supposing the fuel oil is in fact ignited - I am not worrying for the moment how it came to be ignited - if it is in fact ignited, your experience tells you it would burn on water? A. It would burn on water, yes.

40 Q. So I suppose, to put it quite fairly, when you express your view about it not being a fire hazard when released in these colossal quantities in the harbour, what you had in mind was the unlikelihood of it becoming ignited sufficient to set it alight? A. That is true.

Q. For what period were you Master of a ship; I did not quite catch it? A. About four months.

Defendant's
Evidence

No.40

R.H.Wakeford
Recalled
22nd February
1963

Cross-
examination
continued

Defendant's
Evidence

No.40
R.H.Wakeford
Recalled
22nd February
1963

Cross-
examination
continued

Q. When was that? A. Four months ago until today.

Q. What were you? A. In the previous tankers?

Q. Yes. A. Second Officer and Chief Officer. I was Chief Officer for about eight years.

Q. The period you were in tankers. A. Yes, mostly chief officer.

HIS HONOUR: Q. Since 1951 you have been in tankers?
A. Yes, second officer for a year and then chief officer from then on.

MR. ASH: Q. Since 1951 you have been in tankers?
A. Yes. 10

Q. And on general cargo before that? A. Yes.

Q. Have you ever seen a fire on wharves and piers? A. No.

Q. You know, of course, they do unfortunately happen? A. Yes, I suppose they do.

Q. Assume for a moment a fire started on a wharf - it may be for any reason - it could start in a number of ways, could it not? A. Yes.

Q. Say it started, and started to spread on the wharf; do you follow me? A. Yes. 20

Q. You would agree with me that if there was a lot of oil underneath the wharf, on the water and the piles and on the shores, if something fell down and stayed there sufficiently long to ignite the oil you would expect the oil to burn then, would you not? A. I do not know actually. If it stopped long enough.

Q. I put that in, in fairness to you; it stayed long enough to ignite it? A. Yes.

Q. Then you would expect it to burn across the oil in the harbour? A. The oil then in the harbour would be broken up to a certain extent. 30

Q. Might I put this to you: Assume that the oil in a particular case was not broken up at that particular time? - -

HIS HONOUR: In that particular place.

MR. ASH: Q. And in that particular place. Assuming it was a continuous covering of the water in that particular place.

HIS HONOUR: Over a considerable expanse. 40

WITNESS: In other words, an enclosed space?

Defendant's
Evidence

HIS HONOUR: A semi-enclosed space.

MR. ASH: Q. A semi-enclosed space. Assume that, and assume also it has been set alight from this wharf fire. Then you would expect the oil in those particular circumstances to spread, would you not? A. If it is thick enough, but if it was thinned out, no.

No.40
R.H.Wakeford
Recalled
22nd February
1963

10 Q. But if it was thick enough you would expect it to spread? A. Yes.

Cross-
examination
continued

Q. In the light of your knowledge of burning fuel oil on water, if I give you these particular circumstances: the fact that you know oil burns on water, then from that point on you would expect it to spread under those circumstances? A. Yes, if - yes.

Q. I just want to ask you something about the cleaning of tanks. You gave this instance where you got a clearance from the chemist? A. Yes.

20 Q. What was the state of the tank when the chemist first entered it? A. The tank was the same as it was afterwards. It was cleaned out by what we call the Butterworth system. That is, hot water used by jets being rotated vertically, and also around, and that covers the whole tank. The water is 200 degrees temperature with a pressure of 190/200.

HIS HONOUR: Q. That had already been done? A. Yes, that had been done.

30 MR. ASH: Q. What was left in the bottom of the tank? A. At the bottom of the tank there was a slight bit of sludge left, mixed in the rust that came down. Actually it was around the suction. It had not got through the guard at the suction.

Q. It was really concentrated around that particular outlet? A. Yes.

40 Q. And that was after what I will call this steam cleaning, if you don't mind, had taken place? A. Yes.

Q. And then the chemist came in, did he? A. Yes.

Q. He went in, I suppose, just to check that everything was safe? A. Yes.

Defendant's
Evidence

No.40
R.H.Wakeford
Recalled
22nd February
1963

Cross-
examination
continued

Q. Safe from the point of view of fire danger?
A. Fire, and of course the breathing - the gas.

Q. From the fuel? A. There would not be any so far as gas from the fuel was concerned. He goes on board all tankers. He would go down the tank, so far as the fuel oil was concerned. When we carry fuel oil - we are not carrying it all the time, we carry other products.

Q. I appreciate that. I am just referring to the chemist going into this particular tank. He went down and it was necessary for him to certify to you that it was safe for the men to go down there? A. Yes. 10

Q. And the only thing he would be concerned with was whether it was safe for the men to work there or not? A. Yes.

Q. And he would know they were going to do welding? A. Yes.

Q. Why did you have to get a chemist?
A. It is the normal practice. 20

Q. For how long did this Butterworth technique continue? A. We generally do about six hours Butterworthing of each tank. If it is a large tank it is about six hours, and it is about four hours for the small tanks. There are different types of tanks.

Q. I appreciate that. I am confining it to the one tank. Was this a large one? A. Yes, it was a large one - six hours Butterworth.

Q. Then the hot water was released under pressure all over the tank? A. Yes, in jets. 30

Q. Poured on to the sides of the tank at great speed, I take it? A. Yes, 200 lb. pressure.

Q. With the idea of getting the oil down to the bottom? A. Yes. Then it is stripped out continuously.

Q. When it got down to the bottom you would only have the level of hot water? A. No, that is the point. You had to strip continuously. You are seeking to water it with the oil at the same time. 40

Q. So they are mixed up? A. Yes. Because if there was water left in the tank the oil would be at the top, floating, and there would be just water going out. It has to be mixed up, it must be properly mixed up.

Q. The water has got to be mixed up with the oil in the tank, and pulled out through this suction. What is left in the sludge is the thoroughly mixed up product which cannot be pulled out by the suction? A. Yes.

HIS HONOUR: Q. I suppose it would be a bit of oil, a bit of rust and a bit of water; anything else? A. That would be all.

10 MR. ASH: Q. It is still general practice, notwithstanding that stage being reached, for the chemist to go down and certify the position? A. Yes. It is the general practice with any tanker.

Q. That was with fuel oil? A. Yes. With any oil.

20 Q. I should have put this to you: Before I asked you that question I should have dealt with this - Mr. Meares referred to the spillage and I used the word "colossal". Would that be a fair description of it. A. It sounds as though it is quite a large quantity. I do not say colossal. A large quantity.

Q. A very large quantity? A. Yes, but of course I did not see it. It must have been a very large quantity.

Q. 500 yards out this way - -

MR. MEARES: I do not think there is any issue as to this between us.

30 HIS HONOUR: No, he will agree to a very large quantity, now, Mr. Ash.

MR. ASH: Q. You said when the oil is released in a very large quantity you cannot do anything about it? A. I suppose eventually you can clear up a lot of it, but it is going to take an awful long time and an awful lot of expense.

40 Q. Once it is released? A. It spreads. That is where a large quantity comes in, it spreads a lot. Actually oil on water thins, to put oil on the water it will then spread, so a large quantity of oil spilt there, or from over the ship's side, is going to spread a terrific amount, of course.

Defendant's
Evidence

No.40
R.H.Wakeford
Recalled
22nd February
1963

Cross-
examination
continued

Defendant's
Evidence

No.40

R.H.Wakeford
Recalled
22nd February
1963

Re-examination

RE-EXAMINATION:

MR. MEARES: Q. About this chemist, the practice in your experience of tankers has been that irrespective of what has been in the tank immediately before he comes, or prior to that, as a matter of general rule every single tank is inspected by him before you can go ahead? A. Yes.

Q. Is that the same on cargo vessels? A. No, not on cargo vessels - on tankers.

(Witness retired).

10

MR. MEARES: I now tender a report from the Commonwealth Meteorological Bureau concerning Fort Denison, showing the water temperatures in October and November and the average over a period of 75 years and giving over that period the highest monthly and the lowest monthly average for the months of October and November. (No objection).

(Report from Commonwealth Meteorological Bureau marked Exhibit 5).

Subject to calling Capt. Olsen, if he is able to achieve some result over the weekend, that is my case, unless we have forgotten anything per incurium.

20

HIS HONOUR: There is this matter which Mr. Ash mentioned this morning and which had better be cleared up, the document concerning which some questions were asked of a witness. You do not wish to tender that document, I take it, Mr.Meares?

MR. MEARES: No, Your Honour, and I am afraid I cannot put a submission very clearly at this stage but the purpose of my questions was to destroy a suggestion that was implicit, I thought, in Mr. Ash's question that the report in fact was a report he had on spillage. That was the only reason I sought to refresh the witness' memory. I did not use the document other than for the purpose of refreshing his memory. In our respectful submission that does not make the whole of the document admissible.

30

HIS HONOUR: The whole situation is unusual, because in re-examination you are usually asking questions in respect of questions which have been asked in cross-examination, but that is not the way this matter arose.

40

MR. ASH: To save time, if Your Honour will accept the tender from me I will tender the document on Monday morning.

Defendant's
Evidence

MR. MEARES: I will object to that course.

22nd February
1963

HIS HONOUR: My present view is, in that it is an unusual situation, and I am open to persuasion, you cannot make Mr. Meares against his will put it in. I am inclined to the view that he if he wished to do so could have put it in himself because of what had happened in regard to the cross-examination. In other words, it is admissible at his option but not at yours, I think.

continued

MR. ASH: Without arguing that, it could be shortcut by asking leave for Capt. Simpson to be recalled.

MR. MEARES: I am not going to recall him. I do not propose to recall him. If my friend wishes to make this document relevant then he must call him in reply. I do not want to be technical.

HIS HONOUR: I do not know about that. I have excused all witnesses as they finished their evidence instead of keeping them here, but if we had all those captains still sitting along those benches I would probably have given Mr. Ash leave to ask some further questions by way of cross-examining him.

MR. MEARES: We may have some fireworks but I will do my best to get Capt. Simpson back on Monday morning.

MR. ASH: I take it that if His Honour sees fit that Capt. Simpson should be recalled he is still in the same position as if he had waited here.

HIS HONOUR: I think he should come back. If there is some particular difficulty about the time I would extend some latitude to him.

MR. ASH: Your Honour has come to the view at the moment that I cannot force my friend to tender that document. Apparently Your Honour has considered the matter shortly since it was first raised, so I will elaborate on that on Monday.

Defendant's
Evidence

22nd February
1963
continued

I understand the position is that my friend, apart from any document or something that he has forgotten, has closed his case.

HIS HONOUR: Neither party desires to call any further evidence today?

(Further hearing adjourned until 10.30 a.m. Monday, 25th February 1963).

25th February
1963

IN COMMERCIAL CAUSES Nos. 3000 & 3001 of 1955
CORAM: WALSH J.

THE MILLER STEAMSHIP CO. PTY. LIMITED

10

VACUUM OIL CO. PTY. LTD.

CALTEX OIL (AUST.) PTY. LIMITED and
OVERSEAS TANKSHIPS (U.K.) LIMITED

T.W.MILLER & CO. PTY. LTD. v. SAME

FOURTEENTH DAY: MONDAY, 25TH FEBRUARY, 1963

MR. MEARES: The first matter is the question of Capt. Olsen. I seek leave to tender certain cables, which I am able to prove through Mr. Yuill, the Solicitor instructing us. In addition to the cables, he had certain telephone conversations to Singapore. I hand them to my friend.

20

MR. ASH: I do not want Mr. Yuill to go into the box to prove these.

(Abovementioned copy cables handed to His Honour).

MR. MEARES: Apparently, in Indonesia, it is not easy to get an exit visa. We commenced inquiries before those cables, and we directed certain questions to Capt. Olsen. I have deliberately omitted those cables.

30

There is another matter, which I do not think is of any real relevance. We are prepared to concede that a substantial quantity of oil was spilt, but we have had calculations made - and it is a pure mathematical calculation - by Professor Hunter, which I can show my friend, and those calculations deal with the amount of oil you would need to cover surface X with a thickness Y. They do not negate a substantial spillage, but they may negate a spillage of a matter of thousands of gallons. I do not know whether my friend is going to allege

40

that there was anything more than a substantial quantity spilt. If he was going to do that, I would seek leave to tender the evidence, by way of admission or otherwise.

Defendant's
Evidence

25th February
1963

continued

HIS HONOUR: There was some evidence given as to the amount that was to be put in, as to the amount that was still required to fill the tanks or something of the sort. I do not recall the details. I wondered whether, from that, any information could be got.

10

MR. MEARES: No. That will not tell us.

MR. ASH: I prefer to leave the evidence as it stands. If my friend wishes to make any deductions, conclusions, from the evidence -

MR. MEARES: Would Your Honour permit me to proceed with my address, on the basis that I will have a talk to my friend. If those were tendered, it would only take a couple of minutes.

(Index of evidence handed by Mr. Meares to His Honour).

20

No.41

Evidence of J.H.Simpson

No.41

J.H.Simpson
Recalled
25th February
1963

JAMES HOUSTON SIMPSON: Recalled on former oath:

HIS HONOUR: Q. You are still bound by the oath you took earlier in the case, to tell the truth. You need not be re-sworn. A. Very well.

Examination

MR. ASH: Q. You recall that Mr. Meares showed you a document which you said you had before you in 1951, in regard to a report of the spillage? A. Yes.

30

Q. (Approaches witness). I think you said that you took notice of what was in this report, did you? A. Yes.

Q. (Document shown to witness). Would you agree that portion of the information which you had before you was that it was reported to you that the Captain, the Master of the ship, was asked, "In your estimation, how much oil escaped?" and his answer was - (objected to)- "About two barrels"? (Objected to: evidence read at p.569).

40

Defendant's
Evidence

No. 41

J.H. Simpson
Recalled

25th February
1963

Examination
continued

HIS HONOUR: The situation seems to stand this way. He agreed that he thought there had been mentioned in the report, that there was a spillage of about a couple of barrels. He said also that he thought that was not what the Master of the vessel or one of the officers said had been spilt. He would understand that that was the conversation which one of his officers had with the officers of the ship, and later on he said that things in the report indicated that there was a spillage over a vast area, concentrated on both sides of the vessel, and it would indicate a substantial spillage. In what way can all that be qualified, that is of any relevance to the case? 10

MR. ASH: In this way - and there are two other questions on another aspect. As regards the two barrels, it is important that it be in evidence which of the officers told the representative - Capt. Craven, I think - that only two barrels had been spilt. Capt. Simpson's recollection was refreshed on the basis that the material in this report operated on his mind. If a midshipman had told him something it might be different to something from the Chief Engineer or the Captain. In my submission, it is most material to know, portions of the report having been got out in the way they were, what was present to his mind. Capt. Simpson says he never saw the spill and relied on this, and it is important that the full picture be brought out. 20 30

HIS HONOUR: I do not know that it is. I can see why an advocate would want it put into the evidence, if it was a fact, that someone in the report said the Captain said it was only two barrels, but is it really of any legal value?

MR. ASH: Only that it is a question of the totality of the information in Capt. Simpson's mind.

HIS HONOUR: I suppose it would not prove, as a fact, that the Captain said there were only two barrels, would it, if you got this question allowed? 40

MR. ASH: I do not know.

HIS HONOUR: His statement as to what is in a document, concerning what some officer reported as to what the Captain said.

MR. ASH: Yes. It was put forward as an authentic report and I submit it would be evidence of that fact, but even if it is not, I am entitled to get it in - the totality of the information. It is all very well to say, in one paragraph, it extended from there to there, and have other information in the report saying only two barrels went over. I do not know the relevance of Capt. Simpson's future action, if any, but it is most material for Your Honour to know what he had before him. He might have taken regard of some part more than another.

Defendant's
Evidence

No.41

J. H. Simpson
Recalled

25th February
1963

Examination
continued

HIS HONOUR: I think we have got ourselves into a confused situation on a matter which, I think, is ultimately of not much importance. (To Mr. Meares): I would have thought getting further evidence about this report would not really have any value, so far as the opinion evidence of this witness is concerned. But what about that part of your case which seeks to show - and I think does show - that these people took no action about all this, and you seeking to get some benefit from that?

MR. MEARES: I have put my submissions and I will not waste further time.

MR. ASH: Q. (Last question on p.700 read). His precise words were "About a couple of barrels". A. Yes. The report does say that the Master said that a couple of barrels had been spilt, in his opinion.

Q. Would you also agree with me that the word "vast" in relation to the expanse of oil, is not used in that report? (Objected to: allowed). A. That is correct. If my memory serves me right, when I was in Court before that was my own word.

Q. Not based on the report? A. No.

Q. As regards the reference to Mort Bay, would you agree with me that all it says is that furnace oil was observed on the waters of Mort Bay, and extended over a wide area? A. That is correct.

Q. And of course, Ballast Point is at the head of Mort Bay itself? A. That is correct.

Q. And the Caltex Wharf faces in, indeed, to Mort Bay although at the end of it.

MR. MEARES: I think the chart speaks for itself.

Defendant's
Evidence

No.41

J.H.Simpson
Recalled
25th February
1963
Examination
continued

HIS HONOUR: The last question is not pressed?

MR. ASH: Not pressed.

MR. MEARES: Q. I think you were told also that an inspection was made of the foredeck, and the port side was covered with a thick concentration of furnace oil; there were four 44-gallon drums on the deck and a number of coloured seamen were engaged in scopping this up into the drums, one and a half of which were already full; other seamen were occupied scattering sawdust and sweeping up the residue? A. Yes, that is correct.

10

(Witness retired).

(Charts, identical with Exhibit "1", but marked by witnesses, tendered; no objection; to be marked Exhibit "K".)

(S.A.A.Code for Re-Fuel Oil Installations, 1950, and S.A.A.Interim Code of 1945 in relation to Welding Operations, tendered; objected to; not pressed; rejected).

MR. ASH: I should have said, to tie up a loose thread, I had in Court an index of The Times of London -

20

MR. MEARES: We did make inquiries and the English Company was incorporated, I think six months before the fire. I mean Overseas Tankship (U.K.) Limited.

MR. ASH: I thank my friend for that statement, but I cannot carry the matter further. My solicitor wrote to London and the article is not longer extant.

MR. MEARES: I think I should correct what I said and say they were incorporated on 2nd August 1950.

30

MR. ASH: Finally, Your Honour has the particulars of claim and of defence. There is one aspect of the particulars filed to which I may make reference when I address. I assume they are part of the record?

HIS HONOUR: I think you are entitled to refer to them.

(CASE IN REPLY CLOSED).

(Counsel addressed)

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(Further hearing adjourned until 10 a.m. Tuesday, 26th February, 1963.)

No.42

Order granting conditional leave
to Appeal to the Privy Council

IN THE SUPREME COURT) No.3000 of 1955
OF NEW SOUTH WALES } No.3001 of 1955

B E T W E E N

OVERSEAS TANKSHIP (U.K.) LIMITED
Appellant (Defendant)

AND

THE MILLER STEAMSHIP COMPANY PTY.
LIMITED Respondent (Plaintiff)

10

AND BY CONSOLIDATION ORDER OF 26TH MAY 1955

BETWEEN:

OVERSEAS TANKSHIP (U.K.) LIMITED
Appellant (Defendant)

AND

R. W. MILLER & CO. PTY. LIMITED
Respondent (Plaintiff)

CONDITIONAL LEAVE TO APPEAL

20

The 28th day of October, One thousand nine
hundred and sixty three.

30

UPON MOTION made this day on behalf of OVERSEAS
TANKSHIP (U.K.) LIMITED WHEREUPON AND UPON
READING the Notice of Motion herein dated the
18th day of October, 1963 and the affidavit of
Colin Keith Yuill sworn the 18th day of October,
1963 AND UPON HEARING Mr. K.J.Holland of Counsel
IT IS ORDERED that leave to appeal to Her
Majesty in Council from the verdict found against
OVERSEAS TANKSHIP (U.K.) LIMITED and the judgment
of this Court entered thereon in each of the
abovementioned actions be and the same is hereby
granted to OVERSEAS TANKSHIP (U.K.) LIMITED
AND UPON MOTION made this day on behalf of
THE MILLER STEAMSHIP COMPANY PTY. LIMITED and
R. W. MILLER & CO. PTY LIMITED WHEREUPON AND
UPON READING the Notice of Motion herein
dated the 18th day of October, 1963 and the
affidavit of Douglas Robert Arthur Murray sworn
the 16th day of October, 1963 AND UPON HEARING

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No.42

Order granting
Conditional
leave to Appeal
to the Privy
Council

28th October
1963

No.42
 Order granting
 Conditional
 leave to Appeal
 to the Privy
 Council
 continued
 28th October
 1963

Mr. L.W. Street of Counsel IT IS ORDERED that leave to appeal to Her Majesty in Council from the verdicts found against it in the above action No.3000 of 1955 be and the same is hereby granted to THE MILLER STEAMSHIP COMPANY PTY. LIMITED AND IT IS FURTHER ORDERED that leave to appeal to Her Majesty in Council from the verdicts found against it in the above action No.3001 of 1955 be and the same is hereby granted to R.W.MILLER & CO. PTY. LIMITED AND IT IS HEREBY DIRECTED that these appeals be and the same are hereby consolidated AND IT IS FURTHER ORDERED that in each appeal the leave hereby granted is granted UPON CONDITION that the party who is the appellant therein do within three months from the date hereof give security to the satisfaction of the Prothonotary in the sum of One hundred pounds (£100.0.0.) for the due prosecution of the said appeal and the payment of such costs as may become payable to the respondent therein in the event of the party who is appellant therein not obtaining an order granting him final leave to appeal or of the appeal being dismissed for want of prosecution or of Her Majesty in Council ordering the party who is the appellant therein to pay the costs of the respondent therein as the case may be AND UPON FURTHER CONDITION that the party who is the appellant therein do within fourteen (14) days from the date hereof deposit with the Prothonotary the sum of Twenty five pounds (£25.0.0.) as security for and towards the costs of the preparation of the transcript record for the purposes of the said appeal AND UPON FURTHER CONDITION that the party who is appellant therein within three months of the date hereof take out and proceed upon all such appointments and take all such other steps as may be necessary for the purpose of settling the index to the said transcript record and enabling the Prothonotary to certify that the said index has been settled and that conditions hereinbefore referred to have been duly performed AND UPON FURTHER CONDITION that the party who is the appellant therein do obtain a final order of this Court granting ti leave to appeal as aforesaid AND THIS COURT DOTH FURTHER ORDER that the costs of all parties of these applications and of the preparation of the said transcript record and of all other proceedings hereunder and of the said final orders do follow the decision of Her Majesty's Privy Council with respect to the costs of the said appeals or do abide the result of the said appeals in case the same shall stand or be dismissed for non-prosecution

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or be deemed so to be subject however to any orders that may be made by this Court up to and including the said final order or under any of the rules next hereinafter mentioned that is to say Rules 16, 17, 20 and 21 of the Rules of the second day of April One thousand nine hundred and nine regulating appeals from this Court to Her Majesty in Council AND THIS COURT DOTH FURTHER ORDER that the costs incurred in New South Wales payable under the terms hereof or under any order of Her Majesty's Privy Council by any party to these appeals be taxed and paid to the party to whom the same shall be payable AND THIS COURT DOTH FURTHER ORDER that so much of the said costs as become payable by any party under this order or any subsequent order of the Court or any order made by Her Majesty in Council in relation to the said appeals may be paid out of any moneys paid into Court as such security as aforesaid as far as the same shall extend AND that after such payment out (if any) the balance (if any) of the said moneys be paid out of Court to the party who provided the same AND THIS COURT DOTH FURTHER ORDER that pending the said Appeals all proceedings under the judgments in these actions or otherwise in these actions be and the same are hereby stayed AND that each party is to be at liberty to restore this matter to the list upon giving two days notice to the others for the purpose of obtaining any necessary rectification of this order.

BY THE COURT

For the Prothonotary
E.F.LENNON.

CHIEF CLERK

No.42

Order granting
Conditional
leave to Appeal
to the Privy
Council
continued

28th October
1963

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No.43

Order granting
final leave to
appeal to the
Privy Council
12th December
1963

No.43

Order granting final leave to
appeal to the Privy Council

IN THE SUPREME COURT)
OF NEW SOUTH WALES)

No.3000 of 1955
No.3001 of 1955

APPEALS TO HER MAJESTY IN COUNCIL
CONSOLIDATED BY ORDER OF 28th OCTOBER 1963

BETWEEN

OVERSEAS TANKSHIP (U.K.) LIMITED
Appellant (Defendant) 10

AND

THE MILLER STEAMSHIP COMPANY PTY.
LIMITED Respondent (Plaintiff)

AND BETWEEN

OVERSEAS TANKSHIP (U.K.) LIMITED
Appellant (Defendant)

AND

R. W. MILLER & CO. PTY. LIMITED
Respondent (Plaintiff)

ORDER FOR FINAL LEAVE TO APPEAL 20

Thursday the Twelfth day of December, One thousand
nine hundred and sixty three.

UPON MOTION made this day on behalf of OVERSEAS
TANKSHIP (U.K.) LIMITED and on behalf of THE MILLER
STEAMSHIP COMPANY PTY. LIMITED and R.W.MILLER & CO.
PTY. LIMITED WHEREUPON AND UPON READING the Pro-
thonotary's Certificate of Compliance dated the
11th day of December 1963 and filed herein AND UPON
HEARING what was alleged by Mr.K.J.Holland of
Counsel for Overseas Tankship (U.K.) Limited and by
Mr.L.W.Street of Counsel for The Miller Steamship
Company Limited and R.W.Miller & Co.Pty. Limited
this Court DOTH ORDER that final leave to appeal to
Her Majesty in Council from the judgments of the
Honourable Cyril Ambrose Walsh a Judge of this Court
sitting in Commercial Causes delivered in the above
actions on the 10th day of October 1963 be and the
same is hereby granted to the Appellants herein
AND IT IS FURTHER ORDERED that upon payment by the
Appellants of the costs of preparation of the tran- 30
script Record and despatch thereof to England the
sums deposited in Court by the Appellants as 40

security for and towards the costs thereof be paid out of Court to the Appellants who deposited the same.

BY THE COURT

FOR THE PROTHONOTARY

E.F.LENNON
CHIEF CLERK.

No.43

Order granting final leave to appeal to the Privy Council continued

12th December 1963

EXHIBITS

Exhibit "C"

Exhibits

"C"

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Report on Tides by Surveyor

MINTER SIMPSON AND CO., SOLICITORS - TIDAL INFORMATION

Report on tides by Surveyor

10th February 1958

1. Photostat copies of the Fort Denison Tide Sheets from 29th October, 1951 to 2nd November, 1951 have been joined together to give a continuous record of the tide during the period required, and two copies of the information are attached in the roll herewith.

20

2. The heights and times of the high and low waters recorded at Fort Denison during that period were as follows:-

Date	Low Water	High Water
29.10.51	0'6 $\frac{3}{4}$ " at 1.14 p.m.	4'7 $\frac{1}{2}$ " at 7.08 p.m.
30.10.51	0'3 $\frac{3}{4}$ " at 1.13 a.m.	5'3" at 7.33 a.m. }
	0'3 $\frac{1}{2}$ " at 1.57 p.m.	4'6" at 7.51 p.m. }
31.10.51	0'4" at 1.44 a.m.	5'6 $\frac{3}{4}$ " at 8.18 a.m.
	0'2" at 2.42 p.m.	4'4 $\frac{1}{2}$ " at 8.39 p.m.
1.11.51	0'6 $\frac{1}{2}$ " at 2.26 a.m.	5'7 $\frac{1}{2}$ " at 8.45 a.m.
	0'0 $\frac{1}{4}$ " at 3.30 p.m.	4'1 $\frac{1}{4}$ " at 9.28 p.m.

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The tide at Fort Denison at 2.45 p.m. on 1st November, 1951, was 0'3".

3. The heights and times stated above were recorded at Fort Denison and will be correct within 1 inch and five minutes respectively for Mort Bay.

4. All heights stated are above zero, Fort Denison Tide Gauge (old datum).

5. This Branch has no knowledge of any records of water temperatures being kept by the Board.

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J.A.B., Actg. Senior Surveyor, 10.2.58.

Exhibits

"D"

Winds & Tides
Certified
Statement of
Average Wind
direction and
Velocity

29th October
to 1st
November 1951

Exhibit "D"

Winds and Tides Certified Statement
of Average Wind Direction and Velocity

Telephone BU2191
In Reply Please
Quote No.56/4416

Messrs.Minter, Simpson & Co.
Box 521, G.P.O.
SYDNEY.

Meteorological Bureau
Observatory Park

Sydney 29th January, 1958.

Dear Sirs,

In answer to your DTS of 22nd January, 1958
the following information is supplied.

A summary of the weather conditions recorded
at Sydney Weather Bureau for the period 29th
October to 1st November, 1951 is as follows -

1951

October 29th -

"High cloud scattered to overcast 6 a.m. to 6 p.m.
otherwise clear. Dense smoke haze throughout.
Light winds chiefly NE'ly to 9.20 p.m. when changing
to moderate and gusty SSE'ly."

October 30th -

"Scattered cloud before 6 a.m. and between 12 noon
and 3 p.m. otherwise overcast. Light drizzle 7.30
p.m. to end of period. Light to gentle N.E. to
S.E. winds".

October 31st -

"Scattered cloud 9 a.m. to 6 p.m. otherwise over-
cast. Rain 3.50 a.m. to 5.45 a.m. Light to
moderate and gusty S. to S.E. winds".

November 1st -

"Scattered cloud to 9 a.m. then clear. Light to
gentle wind S.E. to S.W. to 9.30 a.m. then chiefly
NE'ly."

The following are 3 hourly temperature and
wind records taken at Sydney Weather Bureau for
the period 9 p.m. on 29th October to 3 p.m. on
1st November, 1951:-

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		29th October, 1951		30th October, 1951		Exhibits
		Wind Direct- ion and Velocity (MPH)	Temper- ature (°F)	Wind Direct- ion and Velocity (MPH)	Temper- ature (°F)	"D" Winds & Tides Certified Statement of Average Wind direction and Velocity continued 29th October to 1st November 1951
10	3 a.m.	---	---	SE 8	61.0	
	6 a.m.	---	---	ESE 5	61.1	
	9 a.m.	---	---	ENE 3	64.0	
	12 Noon	---	---	NE 7	67.2	
	3 p.m.	---	---	ENE 9	68.0	
	6 p.m.	---	---	E 6	64.4	
	9 p.m.	Calm	68.1	ESE 7	60.3	
	12 mid- night	SSE 19	61.8	SE 7	59.7	
		31st October, 1951		1st November, 1951		
		Wind Direct- ion and Velocity (MPH)	Temper- ature (°F.)	Wind Direct- ion and Velocity (MPH)	Temper- ature (°F.)	
20	3 a.m.	SE 12	59.5	SSE 5	57.2	
	6 a.m.	SE 8	57.7	SW 3	55.0	
	9 a.m.	SSE 11	61.7	SW 3	61.8	
	12 Noon	SSE 17	63.1	NE 9	65.6	
	3 p.m.	SE 15	62.6	NE 11	65.3	
	6 p.m.	SE 12	59.9	---	---	
	9 p.m.	SSE 8	59.0	---	---	
30	12 mid night	SSE 7	57.7	---	---	

Yours faithfully

H.M. Treloar
A/G. DEPUTY DIRECTOR
 (H.M. TRELOAR).

Exhibits

"D"

Winds & Tides certified statement of average wind direction and velocity continued

29th October to 1st November 1951

Exhibit "D"

Winds and Tides - Certified Statement of Average Wind Direction and Velocity

COMMONWEALTH OF AUSTRALIA
STATEMENT NO.43

Phone: BU2191
In Reply Please
Quote No.56/4416

Meteorological Bureau
Observatory Park

Sydney 12th March, 1958

CERTIFIED STATEMENT OF AVERAGE HOURLY WIND DIRECTION AND VELOCITY FOR THE PERIOD 29th OCTOBER to 1st NOVEMBER, 1951 RECORDED AT SYDNEY WEATHER BUREAU

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The following average hourly wind direction and velocity was recorded at Sydney Weather Bureau:-

(The wind conditions are averaged for the half hour preceding and the half hour following the time stated and the velocity is in miles per hour)

TIME	1951			
	29th October		30th October	
	Direction	Velocity	Direction	Velocity
1 a.m.	N	1	S.S.E.	15
2 a.m.	Calm		S.E.	12
3 a.m.	Calm		S.E.	8
4 a.m.	Calm		S.E.	5
5 a.m.	Calm		S.E.	4
6 a.m.	W.N.W.	1	E.S.E.	5
7 a.m.	Calm		E.S.E.	5
8 a.m.	W.	1	E.S.E.	4
9 a.m.	N.E.	1	E.N.E.	3
10 a.m.	E.N.E.	5	N.N.E.	4
11 a.m.	E.N.E.	6	N.E.	5
12 Noon	E.N.E.	5	N.E.	7
1 p.m.	N.E.	4	E.N.E.	9
2 p.m.	W.	9	E.N.E.	9
3 p.m.	N.E.	5	E.N.E.	9
4 p.m.	E.N.E.	7	E.	9
5 p.m.	E.N.E.	7	E.N.E.	9
6 p.m.	E.N.E.	5	E.	6
7 p.m.	E.N.E.	2	E.S.E.	6
8 p.m.	E.N.E.	2	E.S.E.	6
9 p.m.	Calm		E.S.E.	7
10 p.m.	S.S.E.	19	S.E.	5
11 p.m.	S.S.E.	19	S.E.	8
12 mid-	S.S.E.	19	S.S.E.	7

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		1951				Exhibits
TIME		31st October		1st November		"D"
		Direction	Velocity	Direction	Velocity	Winds & Tides
1	a.m.	S.E.	9	S.S.E.	6	Certified statement of average wind direction and velocity continued 29th October to 1st November 1951
2	a.m.	S.E.	10	S.S.E.	6	
3	a.m.	S.E.	12	S.S.E.	5	
4	a.m.	S.E.	8	S.	4	
5	a.m.	S.E.	7	S.W.	3	
6	a.m.	S.E.	8	S.W.	3	
7	a.m.	S.	6	W.S.W.	4	
8	a.m.	S.	8	W.S.W.	5	
9	a.m.	S.S.E.	11	S.W.	3	
10	a.m.	S.S.E.	13	N.W.	4	
11	a.m.	S.S.E.	16	W.N.W.	3	
12	Noon	S.S.E.	17	N.E.	9	
1	p.m.	S.S.E.	16	N.E.	11	
2	p.m.	S.S.E.	14	N.E.	10	
3	p.m.	S.E.	15	N.E.	11	
4	p.m.	S.E.	15	N.N.E.	10	
5	p.m.	S.S.E.	12	N.N.E.	10	
6	p.m.	S.E.	12	N.E.	8	
7	p.m.	S.S.E.	9	N.E.	5	
8	p.m.	S.S.E.	7	N.E.	4	
9	p.m.	S.S.E.	8	N.W.	2	
10	p.m.	S.S.E.	10	N.N.W.	1	
11	p.m.	S.S.E.	8	Calm		
12	mid- night	S.S.E.	7	Calm		

I hereby certify that this statement of average hourly wind direction and velocity for the period 29th October to 1st November, 1951, recorded at Sydney Weather Bureau, is a true copy of the official records in my custody.

H.M.Treloar

A/G DEPUTY DIRECTOR
(H.M. TRELOAR)

Messrs. Norton Smith & Co.,
39 Hunter St.,
SYDNEY.

Exhibits

"G"

Bundle of
letters
Overseas
Tankships to
Caltex -
Caltex to
Overseas
Tankships
2nd November
to 16th
November 1951

Exhibit "G"

Bundle of Letters Overseas Tankships
to Caltex - Caltex to Overseas
Tankships

VIA AIR MAIL
DATE 2 NOV 1951

Letter No. OTUK-192

SYDNEY, 2nd November,
1951

TANKER AGENCIES -
S.S. "WAGON MOUND"/
OIL SPILLAGE 10

Overseas Tankship (U.K.) Ltd.
30 Old Burlington Street,
LONDON W.1

Dear Sirs,

We confirm our cable No. 193 of 1.11.51 regarding
bunker fuel oil which was spilled into the harbour
at Sydney by the S.S. "Wagon Mound" on October 30th.

At the time of the incident, the vessel was berthed
at our Ballast Point wharf and was discharging into 20
our storage tanks ashore. At the same time, it was
receiving bunkers from a Vacuum Co. oil barge moored
alongside the vessel. At 4 o'clock on the morning
of October 30th, the forward deep tank into which
the bunker fuel was being pumped, overflowed and a
quantity of fuel was discharged into the harbour.

We attach hereto an abstract of the vessel's Log
wherein you will note that it is stated a faulty
valve was the cause of the overflow and that 30
strong winds at the time blew the spillage into
the water. No estimate of the quantity lost can
be ascertained, but the amount of oil floating on
the water is more than the particulars in the Log
would seem to indicate.

Harbour authorities were very concerned at the
incident, particularly as previous instances of
this nature have caused considerable trouble, but
they allowed the vessel to depart without any delay
on a written authority being given by the Master
for us to represent him in any proceedings which 40
might be taken. Copy of this is also attached.

The vessel subsequently departed for Newcastle at
11 a.m. on the same day without any undue delay.

10 Court proceedings were instituted by the Maritime Services Board and we were requested to appear in the local court at 10 o'clock on the morning of 1st November. As was to be expected, judgment was given against the vessel, but, fortunately a minimum fine only of £25.0.0 was imposed with court costs of 10/- and professional costs of £4.4.0, in all a total of £29.14.0 to which must be added legal expenses of the Solicitor appearing on our behalf.

20 In addition to these, indications are that heavy claims for damages are to be expected from many waterfront property owners and owners of small craft. The oil has floated into many parts of the Harbour causing interruption to the boat building operations of several concerns as well as damage to their facilities which have become smeared with the oil, making it necessary for them to pay heavy penalty rates to workmen in an endeavour to clear away the oil and in the meantime causing a hold up of their operations.

30 Large numbers of privately owned small craft have been effected by the oil and many claims in this regard also are expected, as also are they from private property owners on the waterfront. Already one claim for £100.0.0 damages from a ship-building firm has been received, and indications are that others are contemplating similar action.

You will appreciate that the extent of the costs resulting from this incident can be far reaching but we will keep you advised as developments occur and we are in a better position to gauge the extent of the damages which are being claimed.

40 In the meantime, we have engaged the services of a Surveyor from Lloyds Agents to review all claims which might be received.

Handled BY; CALTEX OIL (AUSTRALIA) PTY.LTD.
(Signed) J.H.WALLACE (Signed) W.E.FIELD

WJMCE/GV
Attachs.

W. E. Field
Managing Director

Exhibits

—
"G"

Bundle of Letters Overseas Tankships to Caltex - Caltex to Overseas Tankships continued

2nd November to 16th November 1951

Exhibits

"G"

Bundle of
Letters
Overseas
Tankships to
Caltex -
Caltex to
Overseas
Tankships
continued
2nd November
to 16th
November 1951

Matter No. OTUK-195

SYDNEY. 2nd November, 1951

TANKER AGENCIES -
S.S. "WAGON MOUND"/
OIL SPILLAGE

Overseas Tankship (U.K.) Ltd.,
30 Old Burlington Street,
LONDON, W.1.

Dear Sirs,

We have already given you a report in our letter
OTUK-192 - which followed our cable 193 of 1/11/51- 10
concerning the spillage of bunker fuel oil into
Sydney Harbour from the s.s. "Wagon Mound".

We now wish to confirm our cable 194 of 2/11/51 in
which we advised you that a fire had occurred
adjacent to our Sydney Terminal.

The question of the oil spillage has received
considerable publicity in the Sydney Press reports
of the fire. We are attaching two copies each of
cuttings from the evening papers, "The Sun" and 20
"Daily Mirror" dated 1/11/51, and morning papers,
"Sydney Morning Herald" and "Daily Telegraph"
dated 2/11/51.

As indicated in our cable, we have received a
letter from Morts Dock Engineering Company Limited
in which they infer they will be lodging claims on
us on behalf of the ship for the damage incurred.
Undoubtedly we will receive similar claims from the
owners of the s.s. "Corrimal". In the meantime we
have interviewed Norton Smith & Company who advise 30
they have been instructed by the United Kingdom
Mutual Steamship Assurance Association Limited to
represent the Master and render him all assistance
in connection with the oil spillage.

We are denying liability in all cases but, as
indicated in our previous letter, are having the
damage insofar as the oil spillage is concerned
covered by a surveyor appointed by Lloyds Agents.
We are planning to have a fire loss Assessor make
a thorough investigation with a view to determining 40
just how the fire did start.

We will keep you further advised.

Yours very truly,
CALTEX OIL (AUSTRALIA) PTY. LIMITED

Handled by:
(Signed) J.H. WALLACE
TOF/VGD

(Signed) A.B. GURNEY for
W. E. Field
Managing Director.

OVERSEAS TANKSHIP (U.K.) LIMITED

30 Old Burlington Street

LONDON, W.1.

Exhibits

"G"

Directors:

E.J. Shearer

A.C. Galloway

V.P. King

G.M. Murray

A.S. Runacres

W.H. Pinckard (USA)

W.F. Bramstedt (USA)

A. Neilson (USA)

F. Von Schilling Jr. (USA) 16th November, 1951

PER AIR MAILOTUK-214

Caltex Oil (Australia) Pty. Ltd.,
Commercial Bank Buildings,
62, Margaret Street,
Sydney, Australia.

Dear Sirs,

s.s. "Wagon Mound" - Oil Spillage

Further to your letters OTUK-192 and OTUK-195 in the above matter, we would acknowledge your cable No.199 also regarding this incident. We note your comments regarding a substitute vessel for the s.s. "Wagon Mound" second half November and this matter is receiving our urgent attention. We will advise you further in due course.

In the meantime, we have written Bahrein fully on the matter and have asked them to obtain the necessary statements.

We should be obliged if you would be good enough to advise us if the ship's personnel, or your goodselves, advised the Harbour authorities of the spill, or was it discovered by their own Patrol? We should also like to know if any steps were taken by the Authorities to disperse the oil safely, also if you warned the people in the vicinity of the Bunker spill.

Yours very truly,
OVERSEAS TANKSHIP (U.K.) LIMITED
E.J. Shearer - Managing Director

By (Sgd.) L. A. Smith
L.A. Smith - General Manager

WAL/BMB
751.2

Bundle of
Letters
Overseas
Tankships to
Caltex -
Caltex to
Overseas
Tankships
continued

2nd November to
16th November
1951

In reply please quote
our Reference No.
761605/INS.

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Exhibits"H"

List Identifying Photographs in respect of the Wharf and Surroundings

Exhibit "H"

List Identifying Photographs in respect of the Wharf and Surroundings. (The captions shown in relation to each photograph being taken from the List)

Millers re "The Wagon Mound"Key to photographs

Each photograph is numbered on the back in red pencil. All other markings on the back of the photographs are to be ignored for the purpose of this key. 10

1. This is a panorama showing the north shore of Morts Bay from the Caisson stretching up to the eastern end of the Sheerlegs Wharf. It is taken from the Joiners Wharf on the western shore of Morts Bay.

2. This is taken from the entrance to Morts Bay. It shows the Caltex Terminal, the Yeend Street Wharf, and the eastern end of the Sheerlegs Wharf.

3. This photograph shows on its extreme right hand side the Yeend Street Ferry Wharf and then the length of the Sheerlegs Wharf. 20

4. This is a photograph of the Sheerlegs Wharf taken from the extreme eastern end and looking west along the surface of the wharf. It will be noticed that there is a vessel in the dry dock left centre of the photograph.

5. This photograph shows the arrangements of piles and cross members underneath the Sheerlegs Wharf. The photograph is taken about 30-40 yards from the Yeend Street end of the wharf. 30

6. This is a close up of the structure of the piles and cross members under the wharf. It also indicates some of the damage caused by the fire.

7. This is a close up of the decking of the wharf showing the gaps between the planking and also their extent to which in places the fire burnt the planking of the wharf.

8. This is another photograph showing the planking of the wharf. 40

9. This is a further photograph showing the planking of the wharf.

Nos. 7, 8 and 9 are taken from various positions over an area of about 50 yards.

Exhibit 1Ignition Tests on Fuel Oil (5)
VARIOUS IGNITING AGENTS IN OPEN AIR

Exhibits

1Ignition Tests
on Fuel Oil
(5)

Agent and Conditions of Test	Oil layer thick- ness 1/16 inch	Oil layer thick- ness 1/8 inch	Oil layer thick- ness 1/4 inch	Oil layer thick- ness 3/8 inch
10 Cigarette butt, dropped from 2 feet	NO	-	-	NO
Cigarette butt, dropped from 6 inches	NO	-	-	NO
Cigarette lighter, flint type, held over oil	-	-	-	-
20 Matches, safety, dropped from 6 inches	NO	-	-	NO
Matches, safety, placed on oil	NO	-	-	NO
Matches, fusee, dropped from 6 inches	NO	-	-	NO
Burning glass	NO	NO	NO	NO
Spark from high voltage spark coil	-	-	-	NO
30 Red hot coke dropped from 2 feet	NO	NO	YES	NO
Red hot coke dropped from 6 inches	NO	NO	NO	NO
Fireworks dropped from 6 inches	NO	NO	NO	NO
40 Fireworks held over oil	NO	YES	YES	YES

Exhibits

1 Ignition Tests on Fuel Oil (5) continued	Agent and Conditions of Test	Oil layer thick- ness 1/16 inch	Oil layer thick- ness 1/8 inch	Oil layer thick- ness 1/4 inch	Oil layer thick- ness 3/8 inch
	Red hot metal from oxy. acet.torch (oil 52 ^o F)	-	-	-	NO
	Red hot metal from oxy. acet.torch (oil 105 ^o F)	-	-	-	NO
	Direct flame from oxy. acet. torch held 6 inches above oil	NO	YES	YES	YES
(6)	<u>Burning Hessian in Still and Open Air</u> <u>All test pieces suspended half on oil</u> (Open Air 7 m.p.h.)				
	Conditions of Test	Oil layer thickness 1/16 inch Still Air	Oil layer thickness 1/8 inch Open Air	Oil layer thickness 1/4 inch Still Air	Oil layer thickness 3/8 inch Open Air
	Size of test piece - 3 in. x 1 in. soaked with oil	NO	NO	NO	NO
	Size of test piece - 3 in. x 3 in. soaked with oil	NO	NO	YES	YES
	Size of test piece - 6 in. x 6 in. soaked with oil	NO	YES	YES	YES

Burning Cotton Waste in Open Air (7 m.p.h.)
All Test Pieces soaked with oil

Exhibits

1

Ignition Tests
 on Fuel Oil
 (7)

Conditions of Test	Oil	Oil	Oil	Oil
	Layer thick- ness 1/16 inch	layer thick- ness 1/8 inch	layer thick- ness 1/4 inch	layer thick- ness 3/8 inch
10 Weight of test piece 0.6 grams suspended half on oil	NO	NO	YES	NO
Weight of test piece 5 grams suspended half on oil	NO	NO	NO	YES

*Minimum size for ignition.

Ignition by Smouldering Oily Cotton Waste
(Wind Velocity 1.6 m.p.h.)

(9)

4" depth sea water

Type of Oil on Cotton Waste 20 gms.	Ignition with oil layer thickness 1/8 inch	Ignition with oil layer thickness 1/4 inch	Ignition with oil layer thickness 1/2 inch
	Lubricating oil, Grade SAE 60	YES	YES
Fuel oil, flash point 170°F	YES	YES	YES
30 Heating oil, flash point 140°F	YES	YES	YES

Exhibits

Ignition of Oily Cotton Waste with
Hot Metal Fragments

1

(20 gms. waste)

Ignition Tests
on Fuel Oil
(10)

Weight of red- hot metal gram	Dropped from height	Wind Conditions	Result
2.3	6 ft.	Still air	Inflamed on impact
3.0	6 ft.	1.6 m.p.h.	Smouldered and inflamed in 6 mins.
5.7	6 ft.	Still air	Inflamed on impact
13.4	6 ft.	1.6 mp.h.	Smouldered and inflamed in 7 minutes
24.5	6 ft.	Still air	Inflamed on impact
40.0	12 ft.	Still air	Inflamed on impact
62.0	12 ft.	Still air	Inflamed on impact

10

(12)

Ignition of Oily Cotton Waste by Oxy-
cutting in Still Air (20 grms waste on bark)

Thickness of oil layer	Height of drop	Waste Ignited	Oil layer ignited
$\frac{1}{8}$ inch	3 ft.	YES	YES
$\frac{1}{8}$ inch	9 ft.	YES	YES
$\frac{1}{8}$ inch	10 $\frac{1}{2}$ ft.	YES	YES
$\frac{1}{4}$ inch	3 ft.	YES	YES
$\frac{1}{4}$ inch	9 ft.	YES	YES
$\frac{1}{4}$ inch	10 $\frac{1}{2}$ ft.	YES	YES
$\frac{1}{8}$ inch	9 ft.	YES	YES

20

Ignition of Dry and of Oily Cotton Waste
by Oxy-cutting in a wind of velocity 11
m.p.h. ($\frac{1}{4}$ " layer oil - 4" sea water)

Exhibits

1

Ignition Tests
 on Fuel Oil
 (13)

Type of Waste	Weight of cotton test piece	Weight of cotton waste	Height of drop	Waste ignited	Oil Ignited
Dry	20	grams	3 ft.	Yes	Yes
Dry	40	"	3 "	Yes	Yes
Dry	80	"	3 "	Yes	Yes
Dry	20	"	9 "	Yes	Yes
Dry	40	"	9 "	Yes	Yes
Dry	80	"	9 "	Yes	Yes
Oily	20	grams	3 ft.	Yes	Yes
Oily	40	"	3 "	Yes	Yes
Oily	80	"	3 "	Yes	Yes
Oily	20	"	9 "	Yes	Yes
Oily	40	"	9 "	Yes	Yes
Oily	80	"	9 "	Yes	Yes

10

Ignition by oxy-cutting 13 feet 2 inches
above Dry and Oily Cotton Waste

(14)

20

Wind Velocity m.p.h.	Time from start of oxy-cutting to ignition of waste in flames					
	Wt. of waste 20 grams		Wt. of waste 40 grams		Wt. of waste 80 grams	
	Dry	Oily	Dry	Oily	Dry	Oily
4.7	Not tried	Not tried	15 sec.	3 sec.	Not tried	Not tried
5.5	55 secs.	15 secs.	25 secs.	6 sec.	Not tried	Not tried
11.5	8 secs.	40 secs.	29 secs.	18 secs.	15 secs.	On Impact
14.0	Not tried	Not tried	33 secs.	17 secs.	Not tried	Not Tried

30

Exhibits

1

Ignition Tests
on Fuel Oil

(15)

IGNITION OF DRY COTTON WASTE (Elec. arc welder)

Wind velocity - 0-1.6 m.p.h.

Height of drop - 30 ft. 6 ins.

Area of waste exposed - that of a circle
7 $\frac{1}{2}$ ins. in diameter

Weight of cotton waste test piece	Time to ignite	Remarks	
20 grams	-	Did not ignite in 180 secs.	
40 "	7 seconds	Smouldered then inflamed	10
40 "	8 "	Smouldered	
40 "	37 "	Smouldered then inflamed	
40 "	45 "	Smouldered	
40 "	70 "	"	
40 "	10 "	Smouldered then inflamed	
40 "	12 "	" " "	
40 "	80 "	Smouldered	
40 "	65 "	"	
40 "	95 "	"	
80 "	53 "	"	20

(16)

IGNITION OF OILY COTTON WASTE (Elec. arc welder)

Wind Velocity - 0-1.6 m.p.h.

Height of drop - 30 ft. 6 ins.

Area of Waste exposed - that of a circle
7 $\frac{1}{2}$ ins. in diameterOil used on waste - fuel oil flash point
170° Pensky Martin and 220° F. Cleveland
open cup

Weight of cotton Waste test piece	Weight of oil used	Time to ignite	Remarks	
20 grams	12 grams	8 seconds	Inflamed	
40 "	12 "	12 "	"	
40 "	12 "	4 "	"	
40 "	12 "	20 "	"	
40 "	12 "	12 "	"	
40 "	12 "	8 "	"	
40 "	12 "	27 "	"	
40 "	12 "	27 "	"	
40 "	12 "	60 "	"	
40 "	12 "	22 "	"	
40 "	12 "	12 "	"	
80 "	12 "	9 "	"	40

Exhibit 5

Report from Commonwealth Meteor-
ological Bureau - Sea Water
Temperatures at Fort Dennison

COMMONWEALTH OF AUSTRALIA

Telephone BU2191
In Reply, Please
Quote No.53/3288

Meteorological Bureau
Observatory Park,

Sydney, 17th August, 1954.

Exhibits

5

Sea Water
Temperature
at Fort
Dennison

10

Messrs. Norton, Smith & Co.,
Box 1629, G.P.O.
SYDNEY.

Dear Sirs,

In reply to your letter 2/Mc of 13th August,
the following information is given:-

Fort Denison Sea Water Temperatures.

20

Month	Average (Over 75 years)	Highest Monthly Average	Lowest Monthly Average
October	63.7°F.	67.2°F. in 1889	60.8°F. in 1905
November	67.1°F.	72.7°F. in 1908	63.6°F. in 1880

Yours faithfully,

(Sgd.) C. J. Wiesner

A/G. DEPUTY DIRECTOR

(C. J. WIESNER).

Exhibit 6

EXTRACTS FROM RELEVANT CABLES RE
CAPTAIN OLSEN - ATTENDANCE AT SYDNEY

30

CABLE 11.2.63 NORTON SMITH TO LONDON

"Wagonmound NFL Meares concerned information
Olsen who possibly required as witness."

CABLE 11.2.63 LONDON TO NORTON SMITH REC'D
13.2.63

(P.M.G. advised that message had been
delayed owing to error of service)

Exhibit 6

Extracts from
relevant cables
re Captain
Olsen -
attendance at
Sydney.

11th February
to 21st
February 1963

Exhibits

6

Extracts
from relevant
cables re
Captain Olsen-
attendance at
Sydney
continued

11th February
to 21st
February 1963

"Wagonmound ouref NFL 512/51 regret unable complete arrangements regarding Olsen until definitely known he must be called stop If this is confirmed London will clear with New York and arrange his relief."

CABLE 13.2.63 NORTON SMITH TO LONDON

"Wagonmound NFL Counsel consider arrangements made Olsen proceed Sydney immediately."

CABLE 19.2.63 NORTON SMITH TO LONDON

"Wagonmound NFL ours 13th advise urgent position Olsen."

10

CABLE 19.2.63 LONDON TO NORTON SMITH REC'D 20.2.63

"Wagonmound NFL 512/51 have no advice from you dated 13th."

CABLE 20.2.63 NORTON SMITH TO LONDON

"Wagonmound NFL Yours nineteenth ours thirteenth read Counsel consider arrangements made Olsen proceed Sydney immediately."

CABLE 20.2.63 NORTON SMITH TO LONDON

"Wagonmound yours 20th received New York being requested today authorise Olsen's immediate relief."

20

CABLE 21.2.63 NORTON SMITH TO SIMMONS SINGAPORE

"Wagonmound imperative Olsen proceeds Sydney first available flight please advise by return earliest possible time arrival Sydney."

P0592/C8815

SINGAPORE 14 23 1013

NORTONS CALTEX SYDNEY

YRTEL TWENTYFIRST OLSEN EARLIEST POSSIBLE
DEPARTURE FROM SUMATRA MARCH FIRST

30

CALPACEM

IN THE PRIVY COUNCIL

No. 7 of 1964

ON APPEAL

FROM THE SUPREME COURT OF NEW SOUTH WALES

IN COMMERCIAL CAUSES

No.3000 of 1955 & No.3001 of 1955

B E T W E E N

OVERSEAS TANKSHIP (U.K.) LIMITED
(Defendant)

Appellant

- and -

THE MILLER STEAMSHIP COMPANY PTY.
LIMITED and another (Plaintiffs)

Respondents

And by Consolidation Order of the Supreme Court
of New South Wales 28th October 1963

B E T W E E N

THE MILLER STEAMSHIP CO. PTY. LIMITED and
another (Plaintiffs)

Appellants

- and -

OVERSEAS TANKSHIP (U.K.) LIMITED
(Defendant)

Respondent

RECORD OF PROCEEDINGS

VOLUME 2

Pages 367 to 794

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