18, 1982

IN THE PRIVY COUNCIL No. 36 of 1979

ON APPEAL
FROM THE SUPREME COURT OF MAURITIUS

BETWEEN:

THE CENTRAL ELECTRICITY BOARD	Appellants (Defendants)
- and -	
BATA SHOE COMPANY (MAURITIUS) LIMITED	1st Respondents (1st Plaintiffs)
- and -	
EAST AFRICA BATA SHOE COMPANY LIMITED (MAURITIUS DEPARTMENT)	2nd Respondents (2nd Plaintiffs)

RECORD OF PROCEEDINGS
VOLUME II

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RECORD OF PROCEEDINGS
VOLUME II

No.34

EVIDENCE OF YVON FELIX JEAN
(Translation)

Defendants' Evidence

No.34
Yvon Felix Jean

Examination (Translation)

1st March 1978

Mr Moollan calls and examines: Mr Yvon Felix Jean (sworn)

Q. In 1972, which post did you hold at the CEB, Mr Jean?

A. The post of Commercial Superintendent at Poudriere Street, CEB, Port Louis.

Q. Was it one of your duties to determine applications for an electric supply?

A. Yes.

Q. In March 1972, Southern Cross Diamond Company applied for an electric supply for the building owned by The Development Bank of Mauritius at Plaine Lauzun?

A. Yes.

Q. You put in the application form?

A. Yes.

Form put in and marked "AQ"

Q. What steps did you take to provide electricity to that customer?

A. As there was no available source of supply we had to use the fuse box from the Bata warehouse.

Q. Will you explain what that fuse box was and how it happened that there was a fuse box at the Bata warehouse?

A. The building was divided into several compartments and Bata had taken two from each compartment. There is a cable box and when Bata installed its warehouse, it put up two compartments. So that there were two fuse boxes, one for its own supply and the other was left empty (unused).

Q. Shortly after the building was constructed, or at the time of its construction, with the agreement of the D.B.M. the CEB had already installed a connection for the supply of electricity to the building subsequently. There must have been 5. Five fuse boxes were installed?

A. There were 2 wings (to the building) - the right wing and the left wing. On Bata's side there were 5. 4 or 5 I am not quite sure.

Q. Finally, Bata rented 2 sections from the DBM instead of 1?

A. Yes.

Q. Hence, in the premises finally occupied by Bata there were 2 fuse boxes?

A. Yes.

Q. One of them supplied Bata with electricity?

A. Yes.

Q. The other fuse box remained unused?

A. Yes.

Q. These fuse boxes, when they were fixed, were they new or second-hand?

A. They were new.

Q. So that when Southern Cross applied for a supply in March 1972, and as there was no other source of supply, you decided to make a connection from that fuse box which had remained unused until then?

A. No.

Q. If I get you right, that fuse box was the last one on the line?

A. Yes, at the end

Q. So you sent your men there to do the work. Who did you detail to fix the fuse box at Southern Cross?

A. Before we took the supply from that fuse box, we sought Bata's permission. We could not have access to the warehouse which was closed all the time, and get on with the installation without Bata first agreeing. We had talks with Bata and we were allowed access and could fix the installation.

COURT: Could you name the person who granted you permission?

A. I don't remember who he was, but he was one of Bata's staff.

Mr. Moollan: After you were satisfied that Bata's authorisation had been obtained, whom did you despatch to fix the installation?

A. Inspector Juste and his team.

Q. Did you check the work there, when Southern Cross was being supplied with electricity from the fuse box?

A. No.

Q. When did you go there for the first time?

A. In May.

Q. Previously in April 1972, Ideal Printing had applied for a supply?

A. Yes.

Q. Ideal Printing were to occupy the premises adjacent to those of Southern Cross?

A. Yes.

Q. You put in the application form of Ideal Printing?

A. Yes.

Form put in and marked "AR"

Q. The application was made on 13 April 72 and the supply furnished on 17 April 72?

A. Yes.

Q. Ideal Printing was supplied from what source?

A. From the same source.

Q. Who did the job?

A. Inspector Juste was in charge.

Q. And you inspected the place in May 1972?

A. Yes.

Q. Do you remember the date?

A. 26 May, as far as I remember.

Q. Any particular reason for your visit?

A. Because the day before there had been a fault and the customers had been left without electric supply for quite some time and the next day when I checked the book I thought I should go there and see what had happened.

Q. You put in the log book in which the fault was recorded? 10

A. Yes.

Q. An extract from the log book has already been produced?

A. Yes.

Q. Entries were actually made in 2 log books so you put in the 2 log books?

A. Yes.

Log books put in marked "AS" and "AT"

Q. Following the fault reported on 25 May 1972 and "brought forward" on 26 May, you decide, 20 when checking the book, to go and see?

A. Yes, accompanied by Inspector Juste and his team.

Q. When you arrived there, whom did you meet? There were Inspector Juste?

A. Yes, Mungroo and Carrim.

Q. Anyone from Bata?

A. We were waiting for someone from Bata to arrive with the keys.

Q. Do you know the name of that gentleman from 30 Bata? His duties?

A. No.

Q. He opened the door and let you in?

A. Yes.

Q. Once in the room where the fuse box was, did you easily have access or was there anything?

A. No. There were boxes stacked against the wall where the cable and the cable box were situated. We asked the gentleman to 40 clear the way so that we could go in there and do our work.

Q. Well, what did your men do once the way had been cleared?

A. They entered, opened the box and the work started.

Q. Did Mr Juste stay on the spot all the time?

A. No. He left for Southern Cross.

Q. He went to see the Customer who had applied for a supply?

A. Yes.

Q. Carrim, Mungroo and yourself stayed in the room?

A. Yes.

Q. When the box was opened, what did you notice?

A. One of the workmen used his testor to check which of the 3 fuses had failed. It was found that 2 of them had blown.

Q. What was done then?

A. The two fuse carriers were removed and two fuses were replaced. The first is placed.....

Q. Who actually did the work?

A. Mungroo did.

Q. So he replaced the fuse?

A. Yes, there was a tube. He replaced the fuse and as he was about to fix the second fuse it blew.

Q. How long have you worked for the CEB?

A. Since 1955.

Q. From your experience and personal knowledge, how is a fuse carrier normally fixed into the fuse box?

A. From incoming to outgoing. If there is any fault, or defect, as soon as it is placed it blows.

Q. When the fuse was replaced, what happened?

A. The fuse blew.

Q. What signs were observed?

A. There was a sort of flash (spark), if I can call it that.

Q. In what state were the two terminals after that flash, that spark?

A. They were intact, but I would say that they were covered with carbon.

Q. After such a flash you just mentioned, could the terminals be partly destroyed or melted?

A. No.

Q. You mentioned carbon. Tell us what you mean by covered with carbon?

A. If you were to put out a lighted candle with your fingers, your fingers would have traces of smoke, they would be blackened.

Q. What was done to the fuse carrier, with its terminals blackened as you say?

A. Mungroo went out to clean it. We always have some grease at hand. Mungroo went out to have the two terminals cleaned.

Q. What happened at that moment?

A. Mr Juste came to tell us that a flash had been observed at Southern Cross which meant that the fault came from there.

Q. So the inspector was there and he came to report that the fault had been detected there. What did you do as regards the Henley?

A. The fuse was not replaced.

Q. What happened then?

A. Mungroo, Carrim, myself and Inspector Juste left for Southern Cross.

Q. What did the Bata employee do?

A. He stayed on the spot.

Q. When you arrived at Southern Cross, did you notice if there was indeed a fault?

A. Inspector Juste explained what he had seen.

Q. What was finally decided? What did you do?

A. The supply was re established at Southern Cross. The fault had occurred between its breaker and the meter. So this had to be removed.

Q. Its system was disconnected. Then you went back?

A. The fuse was fixed anew and everything went back to normal.

Q. Is it possible that, on that day the flash could not only have melted the two terminals but also damaged the terminals inside the box, the "female" part, so much that the fuse and the fuse carrier had to be purely and simply removed and replaced?

A. No.

Q. You could have replaced the lower part if that was necessary by remaining at Bata?

A. No, not at all. The fire point went into the bottom part of the fuses. So we would have had to cut off supply from the transformer and obtain the permission of every industry in that block. This would have taken us very long to do and also we had no spare parts. This procedure would have taken hours and hours.

Q. Which section dealt with fuses on the transformer?

A. If, for example, the box was simply damaged, I would have closed it and gone back to report the matter to the engineering section. It would have been much simpler.

Q. On 26 May at that time, you noticed that both Ideal Printing and Diamond Company took their supply from that fuse box were there a breaker, a middle switch between that fuse box and the rest of the installation?

A. No, there weren't any.

Q. Did you take any measure on that day?

A. I told Mr Juste that to avoid the two companies being deprived of supply, individual fuses should be fixed. I mean a fuse for every installation. Three fuses for Ideal Printing and three for Southern Cross.

Q. What type of fuses did you use.

A. Yorkshire fuses.

Q. Textile Industries also applies for a supply on 25 May 1972. You put in the application form? And on 12 June 1972 the application is granted and the supply is furnished?

A. Yes.

Q. What decisions did you take?

A. After talking to the Textile officials, I thought well, they have applied for 20 KW but they are not going to consume 20 KW they only want us to fix the installation and they are only going to use 10 KW.

Form put in marked "AU"

Q. What was your decision?

A. Those 10 KW were availabl.e The demand was for 20 KW but the actual consumption use would be 10 KW.

Q. Did you fix a branch line?

A. Yes, from Ideal Printing.

Q. Did you add anything else?

A. Yes. Three other fuses to monitor separately the Textile Industries installation.

Q. Was it a permanent installation which the CEB would use to supply electricity to its customers?

A. It was a provisional one. CEB was erecting a station. Cables were being laid.

Q. Has the station been finally built? and the transformer?

A. Yes. The station can still be seen.

Q. When did the station become operational?

A. On 10 or 11 July 1972.

Q. Did you, in the meantime, receive a request from Textile Industries Ltd for an additional load?

A. Yes.

Q. You put in the application form.

A. Yes.

Court: When was it made?

A. On 26 June 1972

Form put in - marked "AV"

Q. There were 2 applications, each for 20 KW?

A. Yes, 20 + 20.

Mr Moollan: To which office was the application made?

A. If it's the Port Louis Office, then at Poudriere Street.

Q. Finally the application came to you?

A. Yes.

Q. Did you approve the application under the conditions prevailing on 28 June. I mean when you were overloaded?

A. I referred the application to the District engineer. He advised me that the application should wait until the station was completed.

Q. When did you expect it's completion?

A. In 11 to 14 days.

Q. Actually Textile Industries application was granted before the station was operational or was it after?

A. When the transformer had been installed, Mr Menton advised us that any demand from Textile could be met.

Court: When was that?

A. The transformer was "commissioned" around the 10th or 11th July. As it was meant specifically for that block of buildings, provision was made to meet the needs of all the occupiers of that block.

Mr Moollan: Not only the occupiers of the block but others too?

A. Yes.

Q. Did you ever go to the premises to see about that question of permanent supply by the transformer which was being built?

A. Yes.

Q. Why did you go there?

A. There was a site meeting, involving the district engineer, the transmission engineer and the potential clients, to agree on the siting, the installation, the laying of cables etc.

Q. Even the pipings?

A. Yes. We had to negotiate with the owners before digging works could be started. We required their approval first.

Q. Did you have occasion to go to the Bata building again in connection with the fuse box after the 26th May?

A. No.

Q. As at the 26th May, electricity was supplied directly from that fuse box to Ideal Printing and Southern Cross. What was then the size of the fuse wire in that Henley fuse box?

A. It was a 18 SWG.

Q. That was the kind of wires which could be used one at a time, or several threads (2, 3, 4) could be twined together. How many 18 SWG threads were there?

A. There was only one in each fuse.

Q. Did you check whether it was fixed?

A. Yes. It was fixed the same day.

Q. From your personal knowledge or from experience of the job, can you say whether a thread of the fuse wire 18 SWG remained all the time in the fuse box?

A. No.

Q. What was done?

A. A thread was replaced a first time, it was replaced by two threads.

Q. When was that done? How did you come to know that?

A. Jupin, one of our workers, went to effect a repair on a fault on the 28th June 1972.

Q. What did he tell you when he returned?

A. He said that a fuse wire 1/18 had blown and that he had replaced it by a 2/18.

Q. What did you tell him?

A. I thought about it and came to the conclusion that a 1/18 wire was probably weak, being given that there were 3 industries to supply. I considered the tests carried out by the

industries - this could sometimes cause a short circuit - and thought it was only reasonable to boost the fuse wire.

Q. Were the 9 yorkshire fuses in use at the time? What were there in those fuses?

A. There was a thread of 18 SWG.

Q. So you approved what Jupin had done and what did you yourself do?

A. I gave instructions to the effect that should a 1/18 fuse wire blow, it should be replaced by a 2/18.

Q. The log books show 2 distinct situations: before the 26th May when there was no yorkshire fuse and no Henley box and after the 26th May when there was a yorkshire box. Could you say what is meant from the language used in the log book by outdoor fuse? Ideal Printing, Textile Industries and Diamond were each of them controlled by a Yorkshire and Henley?

A. The blown outdoor fuse was that of Ideal Printing?

Q. To which box does the outdoor fuse refer?

A. To the Yorkshire.

Q. I can also see control fuse?

A. The customer's fuse possibly, the Yorkshire fuse.

Q. What about section fuse blown?

A. Section fuse is the cable box, the fuses which were in the cable box, in other words the Henley.

Q. When you mention cable box, what have you in mind?

A. The Henley.

Q. Who makes the entries in the log book? Is it you or the workman who does the repairs? Who is the officer who makes those entries?

A. A worker who remains in the office, or the day attendant. In the evenings, the switch board attendant.

COURT: That was on the day you had the yorkshire installed. There wasn't any. But in the book it's outdoor. What do you mean by that? There was the Henley which controlled the two industries from outside and the two industries had no fuse outside. One was subsequently fixed outside.

MR MOOLLAN: There are two different situations My Lord, one prior to the 26th May and I put the question in relation to all entries after the 26th May. The entries for the

25th May needs explanation. The whole of the set of entries on the 25th and 26th May, as for that I propose to adduce evidence concerning these entries.

MR MOOLLAN: Two attendants are responsible for the entries in the book. What is the procedure when there is a fault reported by the client? I mean for the fact that you have to attend to a fault.

A. A sum is claimed from the client for the repairs done to his installation.

Q. As regards the call you made on the 26th May, did you decide whether to claim that sum or not?

A. We did claim RS 5 for faulty installation.

Q. At that time there were only the Henley which controlled the two installations i.e. Ideal Printing and Diamond?

A. Yes.

Q. What then was the outdoor fuse or the control fuse which controlled the installations of those two industries?

A. The Henley Fuse Box.

Q. Who is responsible now for the repair? Is it the attendant or some specific staff?

A. The attendant makes the entries and there is an officer who sends out the claims.

Q. In the entry of the 26th May, we see that the two entries have been "brought forward", does it mean that they refer to the entry of the 25th?

A. Yes.

Q. Concerning the entry "proceed twice, key will be obtained at 9.30", should we, as regards the fault, refer to what had happened the day before?

A. Yes.

Q. There is an entry for the preceding day: Ideal Printing "two phases missing, indoor fuse installation faulty". From what we can read, who would have had to pay the Rs 5 then?

A. Ideal Printing.

Q. You knew that the claim should have been made to Diamond and not to Ideal Printing? What did you do about it?

A. I crossed out the entry against Ideal Printing and initialled the correction.

Q. Have a look at the original. What is the word written?

A. To claim.

Q. So you signed this entry. What next?

A. An appropriate entry is made against Diamond Company.

Q. What was the entry made for the fault reported on 26th May?

A. "Henley fuse drawn" has been written against Ideal Printing. This has been crossed out and replaced by "outdoor fuse". 10

COURT: Was the installation made the day before?

A. The day after when we returned we made the entries for the 25th and the 26th.

MR MOOLLAN: The entry of the 25th May is a brought forward of that particular fault. It is not an original entry, it is a brought forward entry. We see the word "Henley" has been crossed out and the word "outdoor" written above. Who made the entry of the 26th May? 20

A. It was surely the Commercial Clerk.

Q. What are his duties?

A. He made it in order to claim the Rs 5.

COURT: I see the signature Y. Jean twice. The first refers to the first line and the second to the second line.

MR MOOLLAN: Why did you sign?

A. There is an attention mark (an asterisk). I crossed that attention mark. Any deletion must be signed. 30

Q. The person who crossed out "outdoor Henley" did not sign it. The amendment from Henley to outdoor has not been verified by a signature or initials?

A. No.

Q. On the 26th May, when the entry was made in respect to that fault, there was no Yorkshire neither at Diamond nor at Ideal Printing? 40

A. No there wasn't.

Q. Why do you say that it was the clerk who made the entry?

A. Because of the same ink, the same pen used, and also because of the same handwriting.

Q. Can you offer any explanation as why "Henley" has been crossed out and replaced by "outdoor".?

A. Simply to justify his claim, to differentiate

between "consumer's installation" and the fuse which controlled the consumer's installation.

COURT: He says to stress the claim for Rs 5.- he puts outdoor instead of Henley. This cannot really press the claim of Rs 5.- on the other hand it would go against claiming Rs 5.- if it is the outdoor. Henley might mean, for me, indoor or outdoor. This cannot press the claim for Rs 5.-

COURT: The rectification is in respect of Ideal Printing and the claim was made to Diamond Co.

MR. MOOLLAN: If, for instance, there is a fault in a consumer's installation and, as a result, the CEB fuse on the street pole or elsewhere blows, who is responsible for the repairs?

COURT: If it's from the meter inwards, it is the consumer. From the meter onwards it's the CEB?

A. That's right.

MR MOOLLAN: In the present case where was the fault to be found?

A. In the Henley fuse of Diamond Co.

Q. Which fuse blew as a result of that fault?

A. The Henley fuses.

Q. The decision was to cut off the electric supply?

A. Yes, and to claim Rs 5 from Southern Cross

Q. Where can we find a Henley fuse box in Mauritius? Where is it normally placed or fixed?

A. On transformers, in street installations.

Q. As regards Bata, what sort of fuse box was there in the installation before the meter?

A. The Henley.

Q. You said that there were 5 boxes or 5 fuses where they meant for the supply of electricity to consumers?

A. Yes.

Q. When Southern Cross was supplied from those transformers, was a long distribution line taken from there to the building?

A. That is so.

Q. Starting from the consumer after his yorkshire meter, you get first a Henley, then the transformer. What type of fuses was there in the transformer?

A. HRC fuses.

Q. What amperage did you get up there?

A. Perhaps 200 amps. I don't remember. I can't give the exact figure.

Q. You said that on the 26th May, when you went into the room where there was the Henley fuse box, there were boxes stacked up to the wall and that you had to clear the way to have access to the cable box. Apart from those boxes mentioned did you have to remove other boxes, too?

A. Not that I can remember.

Q. Did you clear the way after the fuse had blown and had been replaced?

A. No.

Q. Are you quite sure that Mr Juste had gone to Southern Cross while the repairs were being made here?

A. Yes. I am positive about it. Otherwise we would never have known that the fault had occurred at Southern Cross.

Q. After the fire, did Mr Cole and Mr Davidson call on you at your office?

A. Those two gentlemen called on me. I remember seeing them sitting there (Mr Cole and Mr Davidson)

Q. At that time, in which room was the aluminium cable which supplied electricity to the 3 customers?

A. In my office.

Q. What was found starting from the Henley installation to the customer, after the fire?

A. The cable was burnt out from the Henley to the point where it came out of the Bata building. From the Bata building to the 3 industries, the cable was in perfect condition. It was burnt only when it came out of Bata.

Q. Did the gentlemen who called on you see things, talk and discuss about those bits of cable which were lying in your office?

A. First I took them to my superior officer, Mr Tranquille, who discussed with them, and in the course of the conversation Mr Tranquille and myself decided to take them back to my office to have a look at the cable which used to feed Southern Cross, Ideal Printing and Textile Industries.

Q. They did see the cable?

A. Yes, positively.

Q. Did they touch the cable?

A. Mr Davidson had a close look at the cable which was just beside a cupboard.

Q. Where is the cable lying now?

A. At the CEB. In Port Louis or in Curepipe. I can't say.

Q. Could you find out to enable me to put it in before the Court?

A. Yes.

Q. Mr Davidson also said that the meter had been removed from Bata and taken to CEB. Is that so?

A. I don't think so.

Q. Were there bits or fragments of meters in the same room where the cable was?

A. No. There was just the cable.

.....

At this stage the case is adjourned to to-morrow Thursday 2nd March, 1978. for continuation.

IN THE SUPREME COURT OF MAURITIUS

ON THURSDAY the 2nd day of MARCH, 1978, at 10.30 a.m.

Before the Hon. M. RAULT, Acting Chief Justice

MR YVON FELIX JEAN (Sworn) COMMERCIAL SUPERINTENDENT

MR MOOLLAN: Mr Jean, the overhead cable which ran from the Bata building towards the other consumers and which was in your office, is it the very cable you are producing to the Court?

A. Yes. EXHIBIT

Cross-examined (Translation)

Mr David cross-examines

Q. Mr Jean, you said that, as Commercial Superintendent, all applications for an electric supply came to you at one time or another?

A. I wouldn't say all, but applications from industrial concerns, yes.

Q. Did you determine those applications on your own, or did you consult the engineer? Tell us how you proceeded.

A. When an application came to me, I would send a note, a memo, to the district engineer and enquire whether the load could be accommodated or not.

Q. Which means that it was the district engineer, and not you, who worked this out, or did you also make certain calculations?

A. The engineer's role is to determine whether his transformer is placed where two cables have been put up and whether it can take the load.

Q. Who determines the capacity of the insulation to be set up? Who determines, for instance, the size of the cable to be used? Is it you or the district engineer?

A. "In the instance", I did.

COURT: What do you mean by "in the instance"? Do you mean in this particular case or in all cases? We must agree on the meaning of words. "In the instance" means in this particular case.

A. Generally speaking, I mean where industrial firms are concerned.

COURT: Generally speaking does not mean "in the instance".

MR DAVID: Now, you say, on the one hand, you send a memo to the district engineer to find out if the transformer can accommodate the load and on the other hand, you say that it's you who process the application to determine the implications, to assess the capacity of, for example, the fuse box, the rating of the fuse box to be installed, the size of the wires, the cables. Is it you who decides all that?

A. What do you mean precisely by the fuse box?

Q. I mean the rating of the fuse box to be installed, if any.

A. Yes, it's me.

Q. You decide all these various things?

A. Yes, I do.

Q If we examine, for example, the 3 applications, I should say the 4 applications, but for the time being we'll consider 3 only, we see that the specifications are in HP and in watts, aren't they?

A. Yes.

Q. Do you do the conversion for the amperage?

A. In a word, I am assisted by inspectors,

we do the conversion.

Q. So, you and your inspectors do the conversion?

A. Yes.

Q. Let's consider the case of Southern Cross, for example, since it was the first, you decided to make use of the Henley Service Unit which was to be found in the Bata building and, I understand, you caused 18 SWG fuse wires to be inserted?

A. Yes.

Q. What, then, was the capacity of the rating which you ascribed to the fuse box?

A. According to our table, the fuse is of about 45 amperes.

Q. 45 amperes and not 50, according to your table?

A. Yes.

Q. To decide whether you could use this Henley service Unit, bearing in mind the application from Southern Cross, did you, when making your conversion, take into account any power factor for every detailed equipment borne on the application form?

A. We have to take into account.....

Q. No, Sir, not we have to, but did you?

A. We work out our power factor to .85.

Q. Do you mean to say that in each and every case you work your power factor to .85 or did you work this out only in this particular case?

A. In each and every case.

Q. As a matter of routine?

A. Yes.

Q. So in every single case you use a power factor of .85. Did you think about diversity factor? Or did this aspect escape your notice?

A. I should bear it in mind. We do not speak of diversity factor, we describe it as variation in utilisation.

Q. Did you take it into account?

A. This diversity factor yes, for example, in my experience, no 10 HP engine can perform at full capacity. I think that the engine can be fixed (installed) for 10 HP but it can only perform in the region of 3 or 4 HP.

Q. What do you do next?

A. Then we ask the customer how he proposes to use the supply, the no. of hours of supply

he requires, in what proportion etc.

Q. Then, from information received and from your own experience that a 10 HP engine does not perform at full capacity but only at a third, you determine your diversity factor?

A. Yes, the diversity factor.

Q. It's something that you and your inspectors do. I say "your inspectors" because inspectors are subordinate to you, aren't they?

A. Yes.

Q. How long have you been commercial superintendent?

A. Since 1967.

Q. Did you approve right away the application from Southern Cross made on 16 March? Was any pressure exercised by industrialists, such as the Southern Cross Manager, because they were in a hurry to get a supply?

A. Pressure has no part to play in our decisions.

Q. Was it not the famous Dr Senior who was at the head of Southern Cross.

A. Yes, it was him.

Q. Dr Senior was a go-getter. Didn't he try to influence you to get his supply quickly?

A. I don't quite remember, I'm afraid.

Q. You said that you had nothing to do with the installation proper, that you didn't visit the premises and that it was Mr Juste's cup of tea?

A. Yes.

Q. Who made the decision that a Yorkshire cut out wouldn't be used? Was it you or Mr Juste or who?

A. There were only one installation.

Q. So the question of using a Yorkshire cut out didn't arise? You caused a cable to run from Bata to Southern Cross. Over what distance?

A. About 3/4 the length of this room?

Q. This Court Room?

A. Yes, approximately.

Q. The two buildings are on the opposite sides of the road?

A. Yes.

Q. You visited the premises on the 26th May. You went into the room which contained the Henley fuse unit. Was the box sealed or not?

A. It wasn't sealed.

Q. Meaning that the box was never sealed. From the moment it was supplying electric current the box was no longer sealed, was it purely and simply closed with bolts now lying in Court?

A. That's the usual practice. Henley fuse boxes are never sealed

Q. Was it you who took the decision that a 18 SWG fuse wire would be used?

A. Yes.

Q. Do you have an "Installation Book" or a "Works Book" to show that such and such work was carried out according to such and such specifications?

A. I have my own personal records.

Q. Don't you have an official record or book showing the specifications?

A. We do have our I.A.Regulations Book also our "Regulation of Electricity" for Mauritius.

Q. So you don't have any book to which you can refer in order to refresh your memory, to say that you did such and such work according to such and such specifications?

A. No

Q. The cable which ran from the Henley fuse Unit was in a room which we have described as room No.4, the room in which the Unit was, and the cable then ran through another room, which we have described as room No 3, before coming out into the open The cable ran through 2 rooms: the room in which there was the fuse unit and an adjoining room?

A. To tell you honestly, I have been into Bata store only on one occasion. I don't remember how many rooms there were in Bata store.

Q. Could you at least say how the cable was fixed? Was it fixed to the wall? Tell us how the installation was done.

A. I don't remember.

Q. There was, of course, a meter inside the Southern Cross building?

A. Yes, to record their consumption.

Q. Was there any switch?

A. Yes.

Q. Was there a fuse box?

A. There was a breaker

Q. On the 13th April you received an application from Ideal Printing for 28.3 KW. Among other things, there was a list of the machines, was there a welder too?

A. No.

Q. The application didn't mention a welder?

A. No, it didn't.

Q. Did you discuss the matter with the Ideal Printing people?

A. Ideal had applied for 28 KW. In short, they hadn't put up their installations.

Q. My question was: Did you discuss the matter with the Ideal Printing people when they submitted their application? You said that whenever an application was made you spoke to the industrialists and you discussed with them?

A. I didn't discuss the matter with them.

Q. Didn't you ask them any information about the machines they were going to use?

A. Exactly.

Q. You did talk to them?

A. I have answered that Ideal Printing had to transfer the engine from Quay Street to the Development Bank building.

Q. Did you, in the case of Ideal Printing, talk to the industrialists to assess the power factor and the diversity factor?

A. Yes. I spoke to Mr....I forget his name and asked him whether it was a transfer, since he was moving from Quay Street to Plaine Lauzun.

Q. You mean to say that Ideal Priting was an already set up and operational industry which was being transferred?

A. Yes. It was a transfer.

Q. So you didn't have to talk to them?

A. No.

Q. They applied for 28.3 KW?

A. They applied for the total load (maximum load ?)

Q. They asked for the load (maximum ?) was that the same load as in the previous building?

A. I would say yes.

COURT: "I would say yes"! You should answer in the affirmative and avoid the conditional. You should say "I think, yes" not "I would say, yes."

A. I think, yes.

MR DAVID: You think, yes? This is something that can be checked. It's easy to check.

A. Yes it can be checked if the card is still available.

Q. Could you please check that and inform the court? So Ideal Printing had moved. Do you know when it started moving?

A. When they came to see me for a supply, they had started to move, and the application was rather in respect of electrical installations.

Q. Textile Industry applies on the 25th May. When did the application reach you? When did you yourself see the application form? Was it on the 25th or the 26th?

A. Perhaps one day after or two days.

Q. Do you remember visiting Bata on the 26th May?

A. Yes.

Q. With Mr Juste and two workers?

A. Yes.

Q. When you visited Bata on the 26th May had you already received the application from Textile Industry? If you remember, of course I need not remind you that I assume when I question you, that you are in a position to remember.

A. No.

Q. You had not made any decision yet?

A. Yes, as regards Textile.

Q. You went there on the 26th May in the case of Textile, did you discuss with the interested party?

A. I remember attending a site meeting, the first time I discussed with Textile officials.

Q. You attended a site meeting?

A. Yes, together with the district engineer.

Q. That meeting then took place after the 26th May?

A. Yes.

Q. What about before the 5th June? The installation was made on the 5th June?

A. Yes.

Q. If I understand you well from what you said yesterday, those people told you that though they had applied for 20 KW - I am sorry, according to our information the installation was made on the 1st June, so that your call there would have been made between the 26th

May and the 1st of June - so, somebody told you that though the application was for 20 KW only, they would be consuming only 10 KW and you accepted that statement?

A. Yes.

Q. Ideal Printing, at that time, from that you could see, had only consumed 821 units for the month of May?

A. Yes.

Q. Did you know at the time or did you seek information to know, how many hours Ideal Printing had been running during the month of May to consume 821 units?

A. Around 9 hours per day.

Q. Did you ask for that information?

COURT: You are not asked to work out the figure. This is something that we can all do. You are asked to say whether you, as an inspector as an official of the CEB, you tried to obtain information as to how many hours they had worked, whether they had had a breakdown etc. to find out the load on your line at a particular time: They may have worked an hour a day and consumed so many amperes in that hour. I don't know you may think they have been operating for 9 hours when in fact they could have worked for only 2 hours at full capacity, at full load. What counsel is trying to get from you is whether you enquired from them to find out if they worked regularly for so many hours a day.

A. I remember enquiring about it but I can't say exactly the figure they gave me. I don't remember precisely. I know that they worked for the whole month at more or less regular hours.

MR DAVID: So Ideal Printing had worked for a regular period.

COURT: Relatively regular.

MR DAVID: What did their work consist of?

A. Printing work, the engine was running, I mean all their equipment.

Q. Their printing press?

A. Yes, their printing press.

Q. I am sorry, Mr Jean, but I don't quite get your point. You say that between the 26th and 1st of June you ask for the information, you visit the place and you see that Ideal Printing had been working its printing press for the whole month of May at relatively regular periods, that is to say the whole day?

A. Yes.

Q. I understood that when the application for the installation of Ideal Printing was made on the 13th April, let's get that clear, Ideal Printing had told you that it was effecting a transfer, at a transfer stage, does that mean that the transfer had been completed in April?

A. Not quite. The motors were being transferred. When electricity was supplied, it began to operate some of them, those it had transferred.

Q. However, in May, when you asked for the information, it was operating normally?

A. If by normally you mean all its machines, I wouldn't be able to say.

Q. Be that as it may, you decided that, in the circumstances, it was possible to supply electricity to Textile Industry from the same source as the 2 others and through the same feeder as Ideal Printing?

A. Yes.

Q. Were you aware then that Ideal Printing and Southern Cross had already experienced certain difficulties or didn't you know yet?

A. On the 26th May

Q. Yes, at that time, at the time when you made your decision you decided after the 26th. So you knew that Ideal Printing and Southern Cross had already had trouble on the 25th and the 26th?

A. On the 25th and the fault was repaired on the 26th.

Q. Did anything happen on the 26th?

A. No nothing on the 26th.

Q. Let's say that on the 25th a problem cropped up both at Ideal Printing and at Southern Cross on the 25th?

A. I wouldn't say both at Ideal Printing and Southern Cross.

Q. Would you say at Southern Cross?

A. I would say that both were without electricity because the fuse in the cable box was off.

Q. Because of a fault?

A. A fault caused by Southern Cross.

Q. How is it then that Textile told you that they were not going to consume 20 KW but only 10 KW? Were you hesitant? Why did this happen?

A. They told me how they were going to use their

sewing machines which they were going to install, rather line by line, that they were going to train female workers to work on the machines etc, and that they wouldn't operate and use all the machines at the same time.

Q. Meaning that a number of the machines were going to be used?

A. That a lady would be there solely to train the workers?

Q. You understood that this situation would last for how long?

A. Until the machines were permanently installed.

Q. Did you receive, on the 28th June another demand from Textile for an additional load?

A. Yes.

Q. Didn't that surprise you?

A. There's nothing surprising about it.

Q. Nothing surprising? Here's an enterprise which around the 27th May applies for 20 KW. It is actually going to use 10 KW. And on the 28th June it comes forward with a request for an additional load of 10.5? Isn't that surprising to you?

A. They had asked for 20 KW and it doesn't mean that they weren't going to use the 20 KW, though not the whole load at a time. A distinction must be made here. The machines were mounted, as they had explained, line by line. They told me that when a line would have been completed another line would be mounted but this did not mean that the 20 KW would not be required.

COURT: Was there a problem about the 20 KW? Why all these discussions? They say not to worry because the machines won't be used all at the same time, perhaps 2 or 3 or 10 at a time. Did you find it difficult to supply those 10 KW? Were there any negotiations? Was the CEB in a position to provide the 20 KW or not? This is what you are asked to say.

A. As I have already said being given the consumption and the way Ideal Printing and Southern Cross were running there was no problem. We always discussed with the enterprises to assess the true situation. The application may be for a high load but the consumption relatively low

MR DAVID: When you received the first application for 20 KW, did you think it was a big load and that it was necessary, in the circum-

stances, to make sure that the whole of it wasn't going to be consumed?

A. To tell you, yes.

Q. Assuming that Textile had said that they were going to utilise the full load, what would you have done? If on the 27th May Textile had said: we are business people, we mean to push forward and use the full load of 20 KW?

A. This was not the case

Q. I am being hypothetical I am asking you what you would have done if such a statement had been made to you. You wanted to assess the true situation. Assuming that the company had told you: sorry, we mean to consume the 20 KW.

A. I would have refused.

Q. You would have refused. But on the 28th June when you received the demand for the additional load, weren't you uneasy about it? Didn't you ask yourself whether Textile was keeping it's word? Didn't you worry about what was happening and decide to go and check on the spot and get some information?

A. This is what I did.

Q. This was worrying you, you went to the factory on receiving the second application. This second application worried you?

A. I answered that it didn't worry me.

Q. You weren't worried but you still went there?

A. I must say that, at that time, when Plaine Lauzun was fast becoming an industrial zone, I paid regular visits there. Almost every day I was there discussing with the businessmen.

Q. You didn't purposely go to Textile? As you happened to be there, you visited the factory. During your visits did you go to Textile?

A. Surely I did.

Q. As from the 28th June?

COURT: And because of its application.

A. I'd rather not say definitely yes.

COURT: Is it because you don't remember?

A. Of the exact date, yes.

Q. Not of the date, but did you go there because of the second application? Did you visit Textile because of the second application for an additional load?

A. I am confused because the question asked is

the contrary to what actually happened.

COURT: A question can't be the contrary to anything that has happened. A question aims at seeking information. You know what took place, the Court does not. You are asked whether the second application was the purpose of your visit to Textile. Answer yes or no.

A. No.

MR DAVID: So you were not uneasy, anxious about it? You found that the second application had nothing to make you suspicious?

A. No.

Q. Or to raise certain fears?

A. No.

Q. However, it so happens that you were in the vicinity and that you visited Textile?

A. Textile, Southern Cross and Ideal Printing.

Q. Let's talk about Textile.

A. Yes.

Q. You did visit Textile, Mr Jean, among other industries?

A. Yes.

Q. How long were you there?

A. I don't remember.

Q. During your visit, did you raise the question of Textile equipment which were in operation?

A. Each time I went there I always spoke to the Factory Manager.

Q. About what?

A. About the work, the activities etc.

COURT: You are not asked whether the company is prosperous and functioning well. You are asked about the machines.

MR DAVID: You were there by chance on the 29th June, did you ask the Factory Manager what were the machines which were operating?

A. The factory manager told me, yes.

Q. So you spoke to him?

A. Yes.

Q. Did you ask him why he wanted an additional load?

A. Because.

Q. Not because, but did you ask him?

A. Yes, I did.

Q. What did he say?

A. I don't quite remember what his answer was.

Q. Did he tell you that he was ordering more equipment?

A. Yes, he said he had ordered equipment.

Q. Did he tell you that?

A. Yes, he said that he was expecting the equipment that the CEB had promised to set up the station which would be completed by early July, that he would therefore like to have an additional load to do more work.

Q. So he told you that he had ordered equipment which he was expecting?

A. Yes, which were arriving.

Q. Did you inspect the premises on that day?

A. I have been there on several occasions, I don't quite remember.

Q. So on the 1st June, you approve Textile's installation and we are now on the 5th June, 4 days later.

COURT: Was the application for the additional load made on the 1st of June?

MR DAVID: No, it was made on the 28th June. I'll come back to the 28th June later. I am, for the time being, talking about the 5th June. So on the 5th June Ideal Printing 4 days after Textile's installation, lost a phase, "an outdoor fuse which is blown", is that correct?

A. Yes.

Q. When the installation was set up on the 1st June, each industry had its own Yorkshire cutouts?

A. Yes.

Q. Did an inspector check the installation on the 5th June? Could you refresh your memory from the extract? So on the 5th June Ideal Printing suffered a loss?

A. Yes.

Q. Are Periamtamby Ramgoolam and Soobhany described as workmen?

A. Yes. Periamtamby is the skilled worker, Ramgoolam his assistant and Soobhay is the driver.

Q. Any inspector went on that day?

A. No.

Q. How often did you check the entries in the log book? Every day, every other day?

A. Every day.

Q. Which means that on the 6th, at latest, you saw the entry of the 5th June. Did you think it unusual?

A. It was a fault like any other fault.

Q. Really, Mr Jean? What was the fault?

A. Ideal Printing: one outdoor fuse blown.

Q. Was it a fault or a sign, a symptom? What was behind it? This is what you are asked to say. You could see that "an outdoor fuse had blown" causing the loss of a phase. What was the cause of it?

A. There could be 2, 3 or several causes.

Q. A blown fuse can have several causes?

A. Let's say that a short circuit could have caused the outdoor fuse to blow.

Q. Yes, that's a possibility. What about other possibilities?

A. I do not think it could have been an overload.

Q. Is an overload a possibility? You mentioned a short circuit, could the overload be one of the reasons?

A. Yes.

Q. In this particular case you ruled out an overload as the cause?

A. Ideal Printing was not the only one.

Q. This is what I am asking you.

A. What overload could there be?

Q. I am asking you the question. You thought that an overload was not possible, why?

A. Because.

Q. I want to know what were your reactions on on each occasion. This is what I want to know. I am asking you, since you ruled out the possibility of an overload, why did you rule it out?

A. I am rather at a loss to remember now, this is so far back.

Q. Anyway, you say that a short circuit could be a possibility?

A. Yes, a short circuit in Ideal Printing's installation.

Q. But you didn't enquire about that?

A. No.

COURT: I see in your log book "outdoor fuse blown REP", what does REP mean? Repaired or replaced?

A. It's the same thing. A blown fuse can't be

repaired. It is replaced.

MR DAVID: It was replaced, this is all that was done?

A. Yes.

COURT: Why do you use REP or RPD in your log book?

A. That depends on the man who puts in the entry and on the nature of the faults.

COURT: Shouldn't there be a distinction depending on the nature of the repairs done? Is it left to the fancy of the man who writes the entry?

A. To tell you honestly, workers always say "repaired" when they come back from a job.

COURT: This makes no sense if they both mean the same thing or two different things. Nobody can tell.

A. As the "fuse wire" had burnt out, it couldn't be repaired, it had to be replaced.

COURT: To you REP and RPD make no different?

A. To me it means "replaced".

MR DAVID: We now come to the 16th June. We are now talking about Textile. I see "fuse blown, control fuse blown, replaced" and I see (the names of) Inspector Ah Kai, Messrs Beekun and Shipnot. Was Inspector Ah Kai despatched for a particular reason?

A. No.

Q. Why then did he go there?

A. I wouldn't be able to say. Anyway, he was not despatched for a particular work.

Q. So he didn't make any special report?

A. No.

Q. Textile Industries report that fuses had blown. Inspector Ah Kai and Messrs. Bookun and Shipnot without being sent, go to the spot to replace a fuse, is that what you are telling the Court?

A. Yes.

Q. What is the problem with Textile on the 27th June, we don't know. There's no entry to that effect in the "time of faults reported".

A. We see "outdoor fuse blown".

Q. We see on the other side "outdoor fuse blown" what does it mean?

A. Meaning that it is of the same nature as the previous faults.

Q. Still no enquiry? A. No.

COURT: In certain cases the name of the person who effects the repairs is preceded by the word "inspector", one must assume that when there is no "inspector" before the name, the person is only a worker.

A. Yes.

COURT: Could you explain why when the first fault is reported an inspector is sent, and when the fault occurs a second time, it is a worker? It would seem that a second fault is a more serious sign than the first, and that the second fault should require the attention of an inspector?

A. I cannot say why Inspector Ah Kai attended to that.

COURT: That is for the first fault. But when it occurs again it's a worker who attends to it.

A. There's something missing (in the entry of) the 16th June 1972. The fault was repaired by Rosalba.

MR DAVID: On the 16th?

A. Yes.

Q. I can see Inspector Ah Kai, Messrs. Bookun and Shipnot?

A. There's also Rosalba.

Q. What you say does not agree with the log book. Why do you say that Rosalba also attended? His name does not appear.

MR DAVID: What makes you mention Rosalba?

A. We have compiled a list of all the faults.

COURT: On the 16th June Rosalba is the first name appearing here.

MR DAVID: Rosalba?

COURT: Yes. James Louise and Shipnot.

MR DAVID: And not Inspector Ah Kai?

COURT: Not on the 16th?

MR DAVID: Well, then, I can't understand anything?

COURT: In the other column, there's the names of Inspector Ah Kai, Shipnot and James Louise.

MR. DAVID: I understand, you have it on both sides of the page.

COURT: You also have it on Consumers' Reference No.

MR. DAVID: The name of Rosalba is under Consumer's Reference No.

COURT: On both sides Rosalba is first there and underlined is inspector Ah Kai.

MR DAVID: Mr Jean, could you have a look at the log book itself? Normally, the names of the workers who attend to a repair appear in the column "workmen's names"?

A. Yes.

Q. In this particular case, in the column "workmen's name" there's the names of Inspector Ah Kai, Messrs Beekun and Shipnot. Do you see anything between the names of Mr Beekun and Mr Shipnot? And what does it mean?

A. There is Inspector Ah Kai and Beekun and Shipnot.

Q. Do we find other names underneath?

A. Rosalba and James Louise.

Q. Does this entry (Rosalba and James Louise) refer to the entty of the 16th June or to the next one?

A. Rather to the next one.

Q. In the column on the right we see the names of those who went to the plce - Inspector Ah Kai, Beekun and Shipnot - and there are other names on the left under "Consumers Reference", what are those names?

A. Rosalba, James Louise and Shipnot.

Q. Can you explain that?

A. If you look closely you'll see that the fault was reported at 9.15 and at 9.15 the workers - I am sorry, I made a mistake.

Q. Let's start again. You said that Rosalba also attended on that day. You base your answer from the entry under "Consumers Reference" on the left, don't you, Mr Jean? That's the reason which makes you say so?

A. There are the names of Rosalba, James Louise and Shipnot under the "Consumers Reference No." Rosalba the worker, James Louise his assistant and Shipnot the driver of van No. 846 were in attendance for the repairs. That is why in the morning when work starts the names of those who are on call for the repairs are written down.

Q. Well, when the workers to attend to a fault, their names are written in the column "Workmen's name"?

A. The names of the workers who are despatched to repair the fault.

Q. Who are those who were despatched, Mr Jean?

A. According to this entry in the book it's

Ah Kai, Beekun and Shipnot.

Q. Why do you say that Rosalba went?

A. When the compilation was made, the name of Rosalba was written down.

COURT: The name of Rosalba wasn't included in the compilation?

MR DAVID: You mean to say that every morning the names of those who are in duty, on standby, are put down on the left?

A. Yes.

Q. But from what I see they are not necessarily the same workers who do attend to a repair.

A. For example, if, for one reason or other, those two persons are busy repairing a fault elsewhere, then of course two other workers are designated in case there's a major fault requiring attention.

Q. Shipnot is the driver?

A. Yes.

Q. How is it then that Rosalba and Shipnot are not on the spot while the driver is, since the same driver drove Ah Kai and Beekun?

A. The two others James Louise and Rosalba most probably went by another van.

Q. A van other than that of their colleague?

A. Of Shipnot, yes.

Q. So, on that day, it were Inspector Ah Kai, Beekun and Shipnot who went out?

A. Yes.

Q. So we come to the 28th June. Ideal Printing's fuse blows at 8.45?

A. Yes at 8.45. It's written here.

Q. At what time does work start at Ideal Printing? At what time does it open its doors and start its activities?

A. Business normally starts at 7 in a printing shop.

Q. Repairs to Ideal Printing were effected between 9.10 and 9.55 by Messrs Jupin and Aliphon. These two gentlemen are workmen, not inspectors?

A. Yes.

Q. Messrs. Jupin and Aliphon took it upon themselves to increase the number of wire threats in one phase?

A. Yes.

Q. Without seeking your advice or that of the

engineer or anybody else?

A. Yes.

Q. Let's see where we are. We see that at Ideal Printing a 18 SWG fuse blows on the 28th June. On the 5th June and the 25th May. As regards Textile, we see that the fuse blows the day before, on the 27th June and again on the 16th June. Ideal Printing's fuse blows on the 28th June, and Mr Jupin reported to you that he had boosted the fuse?

A. Yes.

Q. Did you have Textile's meter changed on the 27th June?

A. Yes.

Q. Could you tell the Court in what circumstances, meter of what capacity?

A. 40 amperes.

Q. You replaced it by a meter of?

A. 80 amperes.

Q. Why?

A. Now I can give you an explanation about what you wanted to know in respect of Textile's additional load. Textile had approached me for the new load well before the 28th June He had complained that we were not moving fast enough in the construction of the station etc. So, in order to cool him off a bit I told him that I would have his meter chanted and that meanwhile he would have to submit a request for the new load. He applied later in fact.

Q. So Textile was not happy with the situation and thought that things weren't moving fast enough?

A. Yes about the construction of the station.

Q. Which would enable it to have a permanent installation for the full load if required?

A. Yes.

Q. So before it applied, you had a meter changed to calm things down?

COURT: The meter was changed on the 29th?

MR DAVID: On the 27th.

A. Instructions had been issued since the 26th to have the meter changed.

Q. That's even better, Mr Jean. So even before it applied on the 28th you have instructions on the 26th to play it cool and have its 40 amp. meter replaced by a 80 ampere one? In what

way, Mr Jean, did you expect that this would calm things down?

A. I told them that as far as we were concerned, on the commercial side, we did have the necessary metering equipment, but that the question of load, installations etc. fell within the scope of the engineering side, that I, on my side, would do the needful and that I would put in a word to Mr Menton, the district engineer, to speed up the installation, I should stress that the 40 ampere meter could easily have withstood the additional load and that there was no need to replace it.

Q. Just like the Henley fuse unit, tell me, Mr Jean, how long does it take to remove and replace a meter?

A. That depends on the worker.

Q. How long?

A. Half an hour, perhaps less, 20 mins or 15 mins.

Q. The 80 ampere meter was never removed. It was installed on the 27th June and was not removed until the fire broke out?

A. It was removed later.

Q. On which date?

A. Around the 19th July.

Q. It was removed on the 19th July, why?

A. At that time, after the permanent installation had been fixed up, Textile applied for a much bigger load, around 200 KW and naturally the 80 amp. meter could no longer withstand that load.

Q. And you fixed up a more powerful meter?

A. Yes.

Q. The only way for you to know that a workman has replaced a fuse by a less powerful or a more powerful one is when he tells you about it?

A. Any change is reported either to me or to an inspector.

Q. Does the engineer have access to the log book?

A. The district engineer, no.

Q. So you are the superior officer who inspects that book regularly?

A. Any fault concerning the district engineer are referred to him.

Q. Do the workers detailed for any job have a

look at the log book before they set out to attend to that job? Do you give them any information concerning the installation they are about to inspect?

A. When a fault is reported, say Textile reports a fault, I am quoting Textile because we are talking about it, (then the entry made is:) "Textile Industries, Plaine Lauzun, no line". It's only when the installation is inspected that the situation can be assessed.

Q. The workman is not briefed before he leaves? When Jupin reported that he had replaced the two 18 SWG wires, it was then the 28th June, did you try then to check Textile's consumption to see whether it was going up or down? Let's see. June was the first month of course the reading was taken on the 5th July and 2341 KW were consumed; Southern Cross had jumped from 996 KW in May to 2099 in June, Ideal Printing fell slightly, from 821 in May to 781 in June, do you agree? Were you aware of this situation? Did you have those figures?

A. The reading was taken in July.

Q. All the readings were taken in July?

A. The fault occurred in June.

Q. Were all the readings taken on the 5th July?

A. Since they were all in the same area, the meter reader called and took readings from the meters.

Q. You did not know then the position as regards the trend in consumption? You said yesterday that you had approved the decision, you explained your feelings about it. So you told Jupin that as and when the two others blew to replace them by 2 No.18?

A. Not to Jupin.

Q. To whom then?

A. To the Inspectors who passed the instructions down to the workers, because Jupin isn't the only worker who repairs faults.

Q. You did tell that to the Inspectors?

A. Yes.

Q. I see a column entitled "state size of fuse renewed, if any". Is that, in your opinion, an important information?

A. I must tell you that it is not used.

Q. You are not being asked that question. What you are being asked is whether, in your opinion, that column is important whether it is significant?

In the Supreme Court

Defendants' Evidence

No.34
Yvon Felix Jean

Cross-examination (Translation)

2nd March 1978

(continued)

A. I don't quite see the importance of that column.

Q. You don't quite see the importance of that column "state size of fuse renewed, if any" when you approved what Jupin did i.e. that there should be two No.18 SWG wires in one of the fuses? Did you ask yourself whether the result would be the same if 60 amperes were exceeded? Whether that fuse would blow if the consumers exceeded 60 amperes?

A. Because there were fuses which controlled each of the installations of the users individually.

Q. You thought that because there were Yorkshire cutouts there were therefor no risks?

A. Yes there were no risks because the controlling fuses were arranged in series: weak parts against strong parts.

Q. So there were no risks?

A. Yes, there were no risks.

Q. You didn't think that this could lead to an overload?

A. No.

Q. You didn't think that overheating could be a consequence?

A. No.

Q. What was the idea then of having 2 18 SWG fuses on the fuse box? Why then increase the fuse wires from one to two?

A. I am of the opinion that the phases were out of balance. I mean that there could momentarily be an overload which would blow the 18 SWG fuse, that the load exceeded the resistance of the 18 SWG fuse wire.

COURT: The Yorkshire would still resist?

A. The wire was also an 18 SWG.

MR DAVID: Why didn't you ask Jupin to rush back and replace the two others by 2 18 SWG?

A. A fuse which blows in one section, for example if there is a motor running on two phases, may occasion an overload, but if the two other fuses didn't blow, this meant that they were not overloaded.

Q. On that question of fuses, when my friend Moollan asked you yesterday, referring to the transformer, whether HRC meant high resistance current, would it not mean rather high rupturing capacity?

A. Yes, that's right.

Q. You are employed by the CEB, are you a technician or an electrician?

A. No.

Q. You hold no qualifications in electricity?

A. If you mean any diploma, no.

Q. In which departments of the CEB have you worked?

A. The Commercial department.

Q. Since 1955?

A. Yes.

Q. Have you had anything to do with the electricity branch before that?

A. I used to work as clerk in the electricity department at the Municipality. But only as clerk.

COURT: Generally speaking far from live wires....

MR DAVID: Who on the 5th July 1972, attended to the repairs when Ideal Printing fuses blew? I can't see any entry?

A. Wireman Mungroo if I am not mistaken.

Q. What is meant by Ideal Printing & Ors?

A. It means Ideal Printing and the 2 other industries.

Q. What makes you say it was Mungroo?

A. Have a note here.

Q. A note, from where?

A. From the book.

Q. But on the day the entry was made in the column "details of.....

COURT: One moment please, perhaps you should ask the witness whether that red line does not mean ditto. You have two workmen there, there are two red lines, what are they used for. There are two names on top, two red lines, those red lines stand for something or nothing, that is all. Mr Jean, what do you mean by the names of the workers are not known?

A. On that day Mungroo and Carrim were on duty.

COURT: Answer my question first. The red line may mean either of two things: one, that it indicates that the names of the workers writen on top are the same; two, that the names of the workers are not known. Is the second possibility the correct one?

A. I'll explain, my Lord.

COURT: The question is very simple: Does the red line mean the same workers as above or that

the names of the workers are not known.

A. The same workers: Shipnot, Mungroo and Carrim, However, it may be confusing. There's the name of Deonarain S. (incomplete text) a fault which has been repaired, the workmen who had left at 17.10 hours were back at 18.10 hrs. Francois and Aliphon were the two workmen "on stand by" evening call, the fault reported during the day was repaired by two workmen "on stand by evening call". Ignoring the line where the names of Deonarain, Francois and Aliphon appear, you would see Shipnot, Mungroo. The red lines ditto i.e. Shipnot, Mungroo and Carrim.

Q. For the 6th July, we see the names of Rosalba, James Louise and Shipnot?

A. Yes, Rosalba, James Louise and Shipnot is the driver.

Q. When did you learn that Mungroo had replaced a phase?

A. On the 5th July.

Q. From an 18 SWG to two SWG?

A. Yes.

Q. You agree therefore that on the 5th July it was Mungroo?

A. Yes. It was Mungroo who replaced one 18 SWG by two SWG.

Q. So that then there were 2 fuses with two 18 SWG?

A. Yes.

Q. In the 9 Yorkshire cutouts?

A. The fuses had been kept. The 18 SWG wires yes.

Q. On the 5th July, Ideal Printing and the two other industries had all been affected by the fault? Their supply was off?

A. Yes.

Q. Did Mungroo tell you that he had made the change?

A. He had reported it to the inspectors and all he was doing was to carry out previous instructions.

Q. Why was it not written down that two 18 SWG had been replaced? According to you, was it not important to do so?

A. It should have been written down, yes.

Q. Even if not in the column "size of fuse", it should have been written down?

A. Because it was a specific case.

Q. Judging from the entry in the log book, what was done on the 6th July?

A. Another fuse of 18 SWG had blown, the same thing was done.

Q. Can't you say what repairs were carried out?

A. No, but I knew that the last 18 SWG fuse had been replaced by two SWG.

COURT: You expected it to blow sooner or later?

A. Yes.

MR DAVID: When did you learn that a third fuse had been replaced?

A. When the workmen came back.

Q. Did they tell you?

A. They told the inspectors who reported it to me.

Q. At that time you had already seen the entry of the 5th July?

A. Yes.

Q. You had seen that two 18 SWG had not been put down?

A. Yes.

Q. Why didn't you make sure that the entries were made both for the 5th and the 6th July?

A. When I saw the entry I enquired from the inspectors and was satisfied with their explanations.

COURT: What were the explanations?

A. That a 18 SWG fuse had been replaced by two 18 SWG.

MR DAVID: When did you ask the inspectors?

A. Every morning.

Q. In that case did you ask the information on the morning of the 6th or on the 7th?

A. No, in the morning.

Q. The entry of the 5th July is made in the course of the day, so on the morning of the 6th July you see that a fuse has blown, you ask the inspectors whether it has been replaced, they say yes it has been replaced, even then you don't cause an entry to be made in the book?

A. I fail to see the necessity since I was aware and so were the inspectors.

Q. I believe that you saw the entry of the 6th July only the day after, the 7th?

A. I must tell you that I had leftvery early on

the 6th July. I had left the office at noon.

Q. So you did see the entry the next day, didn't you?

A. Yes.

Q. It was only on the 7th July that you came to know what was done on the morning of the 6th?

A. Yes.

Q. When you accompanied Mr Juste on the 26th, your name and that of Mr Juste should have been put down in the log book?

A. It's not normally done.

Q. It's done for the inspectors?

A. Yes, in the case of Inspector Ah Kai it was done but generally speaking it's not done.

Q. No entry is made even if the commercial superintendent or the engineer goes?

A. Yes.

Q. I see in the book that the entry made on the morning of the 5th July, in the column "mileage", has been amended. Could you explain this to the Court. There are changes in how many lines?

A. In 3 lines.

Q. Tell the Court, please, what happened?

A. Van J 846 departed at 5.50 and arrived back at 6.20. The figures 32062 were written as the "leaving mileage", then they were amended to read 68 or 87, I can't read it quite well. The van had departed in the morning before opening hours to cut off a supply or effect a repair or "remove plug" for street lighting. The van driver was the night driver Bakolah. When Shipnot, the day driver, assumed duty in the morning he noticed that the mileage in the log book was 32087. He asked that the figures be amended to read 32067 because from Poudrière Street to Junction Street the van couldn't have travelled 20 miles.

Q. Was the fee of Rs 5.00 which was to be claimed on the 26th May in fact claimed?

A. If it has been written "to claim Rs 5.00", then it must have been claimed.

Q. Who makes the entries "faults attended to", the Commercial Clerk or one of the workmen?

A. The commercial clerk works in the same office as the fault attendants. When this latter is away, the Commercial clerk

may make the entries.

Q. Would the Commercial clerk have made the entries "faults which occurred"? Who made the entry "to claim Rs 5.00"?

A. The commercial clerk.

Q. And the word "outdoor"?

A. The word "Henley" has been deleted and replaced by the word "outdoor". This was done by the commercial clerk. It's the same pen and the same ink.

Q. Look at the entry of the 25th May, in the previous page. The whole entry has been made by the same commercial clerk?

A. There's only one entry: "Diamond Co."

Q. The same person made the entry of the 25th May "Diamond Co.", the entries "to claim only Rs 5.00" and "fault which occurred" and also deleted the word "Henley" and replaced it by "outdoor"?

A. Yes.

Q. When did you cross out the entry of the 25th May where it's written: "indoor fuse, installation faulty, to claim"? Was the entry made when Jupin and Felicite returned on the 25th May?

A. Yes.

Q. The entry was made in respect of Ideal Printing and another entry "installation faulty, suppressed"?

A. Yes.

Q. Why was it necessary to write above "indoor", on the left, "outdoor fuse blown" on the right?

A. I saw that book only the day after, the 26th.

Q. You made the corrections on the 26th?

A. Precisely, because I was aware of the fault.

Q. You cross out the whole entry of the 25th, you initial it? What do you do? Do you add the word "suppressed"?

A. No. It's was the Commercial Clerk.

Q. He was already there?

A. Surely he asked me for explanations.

Q. Why did you sign?

A. Because I had assumed the responsibility.

Q. You had assumed the responsibility to cross out at the top because "of the cross" of that entry which you erase and which you initial here?

A. Yes.

Q. Why did you accompany Mr Juste on the 26th May? Was it the normal practice? Do you always accompany Mr Juste?

A. I won't say always. But I do sometimes go out with the inspectors to check faults at different places.

Q. Did you have a specific reason or was it a routine practice?

A. A routine practice, yes, but also because the two clients had been deprived of electricity for the whole day.

Q. Two complaints were made by Ideal Printing on the 25th May: the first at 11.25 and the workmen leave at 11.45, they come back at 12.40, it relates to "two phases missing". Why do they complain again at 12.55?

A. The entry in the log book says "indoor fuse", so perhaps the workmen.....

Q. The workmen had done the repairs, did it blow again?

A. I don't think it had blown. It had already blown because the fuses in the Henley box had blown.

Q. The men are back at 12.40. On their return Jupin and Felicite - they have the entry "indoor fuse installation faulty to claim" made?

A. According to the book.

Q. Does it mean that they came back without doing anything or is it that they had replaced a fuse?

A. I don't quite remember.

Q. Because shortly after Ideal Printing rings up again at 12.55?

A. Yes.

R E C E S S

Thursday 2nd March, 1978
Bata Shoe Co. & Anor. v. CEB

AFTER RECESS: Mr David continues the cross-examination of:
Mr Yvon Jean (still under oath)

Q. On 26th May, 1972, Mr Juste and Messrs Mungroo and Carrim and yourself went to Bata at 9.30?

A. Yes.

Q. Why did Mr Juste accompany you. Was it at your request?

A. The workers had gone in the van. I mean Mungroo, Carrim and the driver. I went with Inspector Juste in his car.

Q. Why did you take Mr Juste with you?

A. Normally (when) we go out to attend to a job Inspector Juste accompanies me.

Q. Did you go directly to Bata store?

A. As far as I remember, the store was not open yet.

Q. Where did you go?

A. In front of the entrance.

Q. Did you have to wait?

A. Yes.

Q. Finally the man in charge turned up. Did you stay there until about 11 o'clock?

A. No.

Q. How long did you stay at Bata's store on that day?

A. We left the office at about 9.30. I am at a loss to say when the Bata employee turned up and at what time we reached there.

Q. Try to tell the Court how long approximately you stayed at Bata's store.

A. Around 20 mins.

Q. The keys were available at 9.30?

A. We left the yard at about 9.30, so it would be a bit later. The employee was not in yet when we arrived.

Q. If you refer to your notes you'll see that Messrs. Mungroo and Carrim entered at 11. You said that you remained some 20 mins in the store. When you and Mr Juste and the other workmen, as well as the Bata employee arrived, did Mr Juste enter room No.4 with you?

A. No.

Q. Mr Juste left without entering that room? So he left without noting what had occurred in the fuse box?

A. Exactly.

Q. You know that at that time Juste had gone to Ideal Printing and Southern Cross, at least, to try and detect the cause of the fault?

A. Yes.

Q. Did Juste go alone?

A. Yes.

Q. Did you, the two workmen and the Bata employee enter that room?

A. Yes, (I entered alone) alone.

Q. Did Juste have any tools with him?

A. No, he hadn't.

Q. You enter room No.4, the fuse box is opened and you see what has to be done, i.e. to replace two fuses?

A. Yes.

Q. Look at this entry "Henley fuse blown". What should have been noted precisely?

A. Two fuses blown.

Q. On the face of it, it would appear that only one fuse had blown?

A. Yes.

Q. Then the 2 fuses are removed, they are repaired and you decide to replace them?

A. Yes.

Q. Without waiting for Juste to return?

A. Yes.

Q. Without knowing that if there was a fault by replacing the two fuses further damage could be caused? Without waiting for the result of Juste's investigation. You decide to replace the fuses?

A. We had told Juste that if he noticed anything abnormal to report it to us, but since he had not returned to report anything, we decided to replace the wire.

Q. How long did it take you to replace those 2 fuses?

A. 2, 3 or 4 minutes.

Q. After those 3 or 4 minutes, you replace the fuses?

A. Yes.

Q. You gave Juste only 3 or 4 minutes to do his investigation and to report?

A. I thought you asked me how long it took me to replace the fuses.

Q. How long had Juste gone?

A. Some 5 or 6 mins. perhaps even a bit more.

Q. You didn't hear from him for 5 or 6 mins, or even a bit more, and you replace the fuses?

A. Yes.

Q. You had 2 employees at hand. You could have

sent one to enquire about Juste?

A. I am certain that Mungroo was with me. But as for the other, it's a bit hazy in my mind. Was Carrim with me or with Mr Juste, I can't say.

COURT: You just said that Juste had gone on his own.

A. It's not very clear in my mind.

MR DAVID: You could have sent Mungroo?

A. Mungroo was engaged in the work.

Q. But the work should have waited, you could have sent Mungroo to enquire from Juste about the situation, you didn't think it wise or necessary to wait further?

A. When I said that Juste had gone to check the fault and whether or not I sent Carrim, this is precisely what is not clear in my mind.

COURT: You said that he had gone without his tools?

A. The tools were with Mungroo.

MR DAVID: Before placing the fuses back you could have sent Carrim to enquire about Juste?

A. I can't give a precise answer to your question.

Q. You decided to put the fuses into position and there's a flash when the second one is introduced?

A. Yes.

Q. Mr Juste was not there when there was that flash?

A. Yes, definitely.

Q. Was it Mungroo who introduced the fuse?

A. Yes.

Q. Was it Mungroo who removed the fuse which blew a second time?

A. Yes.

Q. After he had removed the fuse, did you check it?

A. The two together.

Q. Where was the Bata man then?

A. Not very near anyway.

Q. In the room?

A. Possibly. I can't say whether with us, behind us, 3 or 4 feet away from us. I have no idea.

Q. When there was a flash, did you or Mungroo step back to avoid it?

A. We are used to that sort of flashes.

Q. You didn't step back, you stayed put and examined the fuse. In what condition was the fuse then? You said that a terminal was blackened, one terminal or two?

A. It was the "point of contact" which was blackened.

Q. There are 2 terminals in a fuse. Was it the lower terminal or the top one or both that was blackened?

A. Normally, as far as I remember, both. The top terminal was blackened.

Q. You mean the terminal at the top, the upper one?

A. Yes.

Q. Not the bottom one, the lower one?

A. (No reply)

Q. Did you examine that terminal?

A. Yes.

Q. Did you also examine the bottom one, the lower one?

A. Everywhere.

Q. So even though you examined everywhere, you can't say that it was the top terminal which was blackened?

A. There was that flash.

Q. The fuse was removed, you examined it, you saw something. Did you see that it was the top terminal which was blackened?

A. I think the bottom one too.

Q. The 2 terminals were blackened. Was one darker than the other?

A. Yes.

Q. Which one?

A. I don't remember.

Q. Did you examine anything else, apart from the fuse?

A. The box.

Q. Did you examine its base?

A. It was all right.

Q. It wasn't blackened?

A. Of course, if I say that the lower terminal had blackened, it follows that the base was too.

Q. The top part and the lower part of the base had blackened?

A. Yes.

Q. Yesterday you mentioned a tube. Was there a tube in the fuse box?

A. Yes, there was.

Q. Did you have a look at it?

A. Yes.

Q. Did you examine it?

A. Yes.

Q. Of what was it made of?

A. Of asbestos.

Q. In what condition was the tube when you examined it?

A. It had blackened.

Q. Inside?

A. Yes.

Q. Outside?

A. No.

Q. You had your men with you. Could the tube have simply blackened or was it damaged?

A. I don't think so. The tube wasn't damaged.

Q. Who went to clean the fuse?

A. Mungroo.

Q. He went by van?

A. Yes.

Q. When Mungroo left, had Juste returned or not? Did he leave the room before or after Juste had returned?

A. When Juste came back to say that the fault was at Southern Cross, Mungroo, Inspector Juste and myself went back to Southern Cross.

Q. You saw the flash in room No.4, the fuse was removed, you examined, you saw that the terminals were blackened, that the tube was blackened, the base was blackened, didn't you at one time tell Mungroo to go to the van to clean the fuse. Who cleaned the fuse?

A. Mungroo.

Q. When Mungroo leaves to clean the fuse in the van, didn't Mr Juste return at that moment, to Bata?

A. I believe I said that Mr Juste had returned to report that the fault was located at Southern Cross.

Q. When did he return?

A. The workman, Inspector Juste and myself had gone to Southern Cross to do a job.

Q. After the flash Mr Juste returns. He speaks to you and the three of you go to Southern Cross. You stayed there and then returned to Bata?

A. That's where Mungroo had stopped.

Q. He goes to the van to clean the fuse?

A. Yes.

Q. When you left, the Bata employee was alone in the store?

A. Alone or with other employees. Idon't know.

Q. When you left what did Mungroo take with him? Was it the fuse, the fuse carrier with the tube in it?

A. Yes.

Q. To enable you to examine the tube, was it removed from the fuse carrier?

A. "Being given that the wire had come out."

Q. The fuse wire in the tube had disappeared, had melted away?

A. A short circuit would melt it.

Q. Was the base cleaned?

A. When we returned, yes.

Q. How?

A. It could be cleaned by means of the tester, a bit of rag cloth which workmen always carry. They wiped it.

Q. What sort of tools had the men?

A. Tools.

Q. Including what is called an insulator?

A. Insulated tester, insulated pliers and insulated gloves.

Q. Do you think that the occurrence called for a more detailed entry in the log book? Or are you satisfied with the entry made: "Henley fuse blown..... ? Do you think that sums up the whole situation correctly?

A. Two fuses in the cable box flew off?

Q. Assuming that you had to speak about the Henley fuse. If I were to question you about the Henley fuse, to ask you what took place on the 26th May, would you say "Henley fuse checked" or "Henley fuse box repaired"?

A. In a general way we say "repaired", we do not write down "checked" or "cleaned" in the log book.

Q. Did Mr Juste explain or describe the sort of

fault he had seen at Southern Cross? You were with him. There was flash at the time you inserted the fuse?

A. Surely.

Q. What fault had he found that caused the flash?

A. Two wires met between the breaker and the meters. I say meter but it could be a polyphase meter.

Q. You say that apart from the cleaning and the cleaning of the fuse nothing else was done?

A. Absolutely nothing.

Q. Do you ever replace the base of a fuse?

A. That's not a job for our department. Such a job would be a matter for the engineering section.

Q. Were your men qualified for that job?

A. Every workman in the CEB is qualified for that job, but we stick to our scheme of duties.

Q. It's pure luck that Mr Juste saw that flash. Had he gone empty-handed, how could he have detected a fault elsewhere instead of the flash from where he was?

A. Southern Cross does not cover a wide area. This could be seen without removing them.

Q. In your opinion it was enough just to have a look, just like that?

A. The supply was cut when he was there. When the supply was back he could see.

MR DAVID: When Mr Juste returned after the flash, he came to room No.4 Did he examine the fuse carrier, the base and all that?

A. No, he didn't.

Q. When he arrived you told him: see, there was a flash?

A. It was him rather who told us that there had been a flash.

Q. Mr Juste didn't examine the base?

A. No.

Q. Is he a technician?

A. Yes.

Q. A qualified technician?

A. I would say qualified from his early childhood.

Q. He did not inspect?

A. It was my responsibility. We had shared the work

between us two. He did the installations and I did the fuses.

Q. Did you give a statement to the police after the fire?

A. No one questioned me. I must make a distinction between giving a statement and being questioned by someone.

Q. You deponed at the Judicial Enquiry? You were called as a witness?

A. Yes.

Q. You answered questions which were numbered

(1) Yes, I know that a fire broke out at Bata shoe factory

(2) Yes, there was a fuse box installed in the building

(3) On the 6th July in the morning the fuse box was repaired

(4) On the 26th May the fuse box was checked.

Did you make a difference between "repaired" and "checked"?

A. It should have been recorded "checked and repaired"

Q. (6) I do not remember the name of the workers who worked on the fuse box on the 5th and 6th July?

A. Yes.

Q. (5) The six wires from the fuse box were almost fixed to the wall.

What did you mean by that?

A. I deponed in French not in English.

Is the translation faithful?

Q. I'll read it over to you again: the six wires from the fuse box were almost fixed to the wall?

A. I did not use the word almost.

Q. Please tell the Court what you said at the Judicial Enquiry?

A. As far as I remember I said "were fixed". The wires went over the wall. They were fixed to the wall.

Q. How did you say that the cable which came out of the fuse box was fixed to the wall?

A. I don't remember my exact words.

Q. You didn't say "almost"?

A. It means that a nail had been driven in half way.

Q. Did you say how the wire looked?

A. Yes.

Q. Can you say it now?

A. That took place six years ago. It's hard to remember exactly now.

Q. You went there only once?

A. I saw several things. It's hard to say now whether the clips were 3 or 4 feet apart.

MR MOOLLAN: The set that goes to Southern Cross will be three phases and the set which goes to Ideal Printing 3 phases.

MR DAVID: The CEB people went to Bata store for the first time after the fire. When was that?

A. The day after in the morning, around 9 or 9.30.

Q. You spoke of the room in the finished goods store where there was another cable box?

A. Yes.

Q. Did you go to Bata store on the 7th July?

A. Yes.

Q. Did you find a meter in the room where the other box was?

A. No.

Q. The CEB didn't recover that plate and that meter?

A. No.

Q. To your knowledge Mr Jean, no one was prosecuted for arson after the fire?

A. No.

Q. Could you arrange to put in the consumption figures of the 3 consumers concerned for the months of July and August 1972?

A. Yes.

Q. The log book shows the various calls which CEB makes at the customers' requests. What about calls which you make on your own? Do they appear in the CEB log book?

A. No.

Q. To replace a meter no entry is made anywhere? Supposing you wanted to replace Textile's meter?

A. Not necessarily.

Q. Do you ever make entries? If so, in what book?

A. We have a "works log book".

Q. Which is kept in your office?

A. Since 1972, those books have to be sent to our Archives after 2 years. The documents are

destroyed.

Q. Can we get that 1972 works log book?

A. I wonder. No.

Re-Examined

Re-examined by Mr Moollan:

Q. When the workers attend to 2 or 3 calls in the same area, do they have to put an entry for each call or do they attend to the calls in just one round?

A. They go out when there are 3 or 4 calls.

Q. On the 26th May, 1972, I see that a fault is reported by Ideal Printing first, brought forward; Diamond Company brought forward, 8.45; Japanese Company Cerne Dock 9.30; Motor car workshop Redoute 9.30; the men return in the same van J 846 at 11 a.m., the same mileage from 30715 to 30721. Does it mean they made them all (in one round)?

A. Yes. It means they went out and returned after attending to all the faults reported.

Q. When we look at the entry of the 26th May where it is stated "outdoor blown" and see the fault herein described, also the entry "two phases missing", do we get an idea of the situation from the whole entry?

A. Two fuses had blown.

Q. On the 5th July I see another entry in the book, on the left,"Sibnauth, Mungroo, Carrim" in red ink. What does that mean?

A. That the two had gone out on the call and that a driver was working on that day.

Q. We see that the first call on that day was for Blyth Bros. Departure 8.30 arrival 8.45 by the van.

A. Yes.

Q. Let's see the displacements of van J 846. Where did it go from that time?

A. First it went to Blyth Bros where there was a fault to attend to. Second, to Plaine Lauzun and the Marine Services. The van came back and went out again to attend to a fault at Corps de Garde, the return mileage is 32007. Then the van went out to Ste Famille, Ideal Printing. 3.30 Ste Famille, Plaine Lauzun return, mileage 32017.

Q. At what time did the van go out when the mileage read 32007 to return when the mileage was 32017? We see another entry on top of this entry?

A. That was a mistake. It has been amended to read 32019.

Q. Naturally, after it had attended to the fault at Ste Famille, Plaine Lauzun?

A. Yes.

Q. The same workmen were involved, and the other fault was repaired afterwards, this explains why the entry is in red?

A. Yes.

Q. You said that some time after the connection of Textile Industries the meter was replaced. Did this have anything to do with the second application or another application?

A. Actually with no application at all.

Q. What's the load Textile now has?

A. 404 KW.

Q. How was this load increased in relation to the first application?

A. The original application was for 20 KW.

Q. Each time it increases its consumption does it apply for an additional load?

A. Surely.

Q. What was done to its installations as it applied for additional loads?

A. They were completely replaced.

Q. You said that you were involved in all the insulation works at Plaine Lauzun concerning Industrial enterprises. When installation works are under way, what happens? Is it as normal as when you are working in a house where there are faults?

A. Faults occur frequently. There are short circuits.

Q. When you look at the log book and you see that when an industrial concern is moving in there are short circuits, does that surprise you?

A. No.

Q. In May, June 1972, Diamond Company and Textile Industries and also Ideal Printing were charged according to what rates?

A. It's described as industrial rates, commercial rates.

Q. Why was the commercial rate applied to those people?

A. They were not productive. They were moving in. They had applied for a supply to instal their equipment.

Q. Were they transferred from the commercial rate to the industrial rate?

A. After the sub-station had been put into operation.

Q. How far from the Bata building were the 3 industries houses?

A. At the time the Development Bank erected the buildings, there was a line within the precincts of the industrial zone.

Q. How far apart were the two buildings?

A. A road separates the two buildings. Something like 30 or 40 feet.

COURT: What do you understand by "fuse oxidised" in the entry of the 1st July.

A. It means it was rusty at the point of contact.

Q. What do you do then, you replace it or you clean it?

A. We clean it.

No. 35

EVIDENCE OF NOEL JUSTE

Sir Raymond Hein calls and examines:

Mr Noel Juste (sworn)

Q. Are you a senior Inspector?

A. Yes.

Q. Who is your immediate boss?

A. Mr Jean.

Q. In 1972, industries were being set up in the free zone?

A. Yes.

Q. Buildings had been construed for occupation by the various industrial enterprises?

A. Yes.

Q. Those buildings had different premises for use by the different enterprises?

A. Yes.

Q. Each premises was equipped with electrical installations?

A. Yes.

Q. What sort of installations?

A. Cable boxes, we call them fuse cable boxes.

Q. Henley cable box?

A. The trade name is Henley.

Q. We gather that Bata occupied in those buildings two premises originally meant for two new industries?

A. Yes.

Q. Did Bata use the two boxes which were in the two premises?

A. No. One only.

Q. By the 6th March, Southern Cross Diamond had applied to the CEB for a supply?

A. Yes.

Q. Were the first premises in which Bata is now, were they occupied then?

A. Yes.

Q. Can you say approximately when the premises were first occupied and supplied with electricity?

A. Yes, around 1967 or 1968.

Q. Who were responsible for the electric installation in that building?

A. The engineering side, Mr Menton who is in charge of the Port Louis area.

Q. Where was the transformer which supplied Bata?

A. At the end of the Building occupied by Bata. It's called a Pole Mounted Transformer.

Q. Was that transformer at the Bata end of the building or at the other end?

A. The other end.

Q. After the engineering side had agreed to supply electricity, who was responsible for the installations?

A. An individual customer simply writes an application form for a supply whereas industries do contact Mr Jean. Negotiations then take place, the premises are visited and a plan is drawn up. The applicant fills in the form and if everything is O.K. the application is granted. If the load is rather on the high side, the engineering side must first approve it.

Q. In March 1972, Southern Cross applied for a supply?

A. Yes.

Q. Was Southern Cross in the same building as Bata or was it in another building?

A. In another building recently constructed.

Q. Was it its very first tenant?

A. Yes.

Q. Was a separate installation then available for supplying electricity to the second building?

A. No.

Q. What steps did you take for its supply?

A. Mr Jean discussed the matter with the manager of Diamond and a few days later he asked me to accompany him. We visited the building. There was nothing in it. We had to find means and ways. We knew that there was a box available in Bata, from where a line could be taken to supply the other building.

Q. Did you obtain the necessary authority to install a supply line from that unused box to Southern Cross?

A. Yes.

Q. That box which was available, as you said, was it at the far end of the building? I mean the last box installed in the building?

A. Yes.

Q. That box is fed from the transformer?

A. Yes.

Q. Could you describe how the cable goes from the transformer to that box?

A. This had been done by the engineering side under the responsibility of Mr Menton. A four wire cable ran from a Henley Box outdoor type fixed to the pole where the transformer was went partly underground and entered the building through trenches covered with slabs. Distribution wires ran along the corners of each section.

Q. The cable came down the pole, went directly underground but did not pass through a concrete canal?

A. A trench had been dug in the ground.

Q. Up to the entrance of the building. From that entrance you say that the cable went along a trench?

A. A trench had been dug along the whole length of the building, a trench made in the concrete works.

Q. A route system, a network had been laid. On what did the cable rest?

A. On concrete

Q. At a certain depth from ground level?

A. Yes. Some 8 inches. The trench was covered with concrete slabs

Q. The cable branched off at different points to enter each consumer's premises?

A. Yes. They are called transfer joints.

Q. Right up to the last box?

A. It ended with the last box.

Q. So now that you have to bring the supply to the last box, tell us exactly how you proceeded from the start.

A. When talks with Southern Cross manager had ended, we sealed bolts on the outside of each building - Bata building and Southern Cross building - a bolt on each side.

Q. A bolt? What for?

A. To fix the bracket for the wire, a kind of a U shaped iron.

Q. Now here's your box. The wire is live when it comes out of the box. Let's have all possible information about the wire, its size, its quality etc.

A. The bolts were fixed into the concrete. They could not be handled on the same day. The customer, Southern Cross, had paid. Mr Jean, the Superintendent of Port Louis, had said go ahead with the work. He had specified the size of the cable. I took a workman and his assistant with me in the van. Arriving there, I don't remember whether it was me who went to see the Bata employee or whether Mr Jean phoned. Finally, we were able to enter the building.

Q. What sort of installation works did you do there?

A. We started running a cable from Southern Cross. It crossed the yard and entered Bata building. The cable was fixed all along at a certain height. When we were near the box, the cable ran vertically downwards, still at a certain height, and then it entered the box through a cutting which we had made. We also used a bimetal called top saddles.

Q. Look at this plan which has been given to us by Mr Davidson. Do you recognise the box?

A. Yes.

Q. How many wires came down from the ceiling?

A. Three.

Q. The plan says six.

A. It's meant for only one client.

Q. There was only one customer then, the Southern Cross?

A. Yes.

Q. You made the connection in the box?

A. The wire came down all along the wall.

Q. We have been told that the bimetal connector was necessary, the ascending part in aluminium and the descending part in copper?

A. Corrosion takes place in the bimetal, after a certain time, between the aluminium part and the copper part. We had to make sure that no corrosion would take place.

Q. What was the size of the fuse used in the box?

A. As far as I remember it was a (size) 18 wire.

Q. (Exactly to connect with your neutral ?)

A. There is armouring on that cable. It is hard and wrapped in an armouring. At a certain height the armouring of a cable is removed so as to reach the bimetal. The same thing is done with the second cable, and as for the 3rd cable the armouring is removed and it goes on to join the other 2 cables. The neutral kept all its armouring.

COURT: There is first the insulated cable, then the armouring, and again another insulating material?

A. Yes.

SIR RAYMOND: How did you proceed to connect each of the cables to the bimetal conductor? You first took a cable, connected it with the second, then with the third and so on?

A. The first cable comes out after the insulation has been removed. There are 22 or 24 wire threads. A certain length goes into the box. The second cable also comes out. The whole bundle is tied together when to go to the far end, the same procedure is adopted for the third.

Q. Is your connector big enough to accommodate all the cables.

A. Yes.

Q. Your cable has now reached Southern Cross entrance. How do you proceed to run it down Souther Cross building?

A. We clip it down as we go along. There was a hole in the wall. It was fixed provisionally to the meter of Southern Cross. The

cable entered the meter at that point.

Q. The cable which comes out of the box goes through the bimetal connector?

A. It comes out to go into the bimetal.

Q. Did the cable run up to the top of the wall?

A. Yes.

Q. How was it fixed to the wall?

A. That bit which came down vertically was not fixed to the wall. A part of it was tied by means of tape. That bit which went horizontally was fixed to the wall at several points. It was a provisional installation.

Q. It was on the wall?

A. Yes, it was.

Q. What safety was there for the Henley fuse box in the transformer? Was there a fuse behind the box? What was the capacity of that wire, that fuse?

A. I don't remember. It was installed by the engineering branch. Surely it must have been sufficiently powerful for those industries.

Q. You have now completed Southern Cross installation. Ideal Printing now asks for a supply a month later?

A. Yes.

Q. You are informed that an application has been made and agreed to?

A. Yes.

Q. What sort of installation did you put up ?

A. I proceeded much the same way as for Southern Cross. There was already a "built-in" bolt. Another bolt had to be fixed for the cable to run from Bata to the centre of the building.

Q. Did you yourself do the installation works of Ideal Printing?

A. Yes. I mean I was in charge of the works. The same procedure was done.

COURT: The cable ends at the same bimetallic connector? No other cable was required? It goes directly from the connector?

A. Yes.

SIR RAYMOND: What did you do as regards the neutral?

A. The same thing as for Southern Cross. Three openings from the armouring.

Q. Textile applies for a supply on the 25th May?

A. Yes.

Q. And you are authorised to put up Textile installation?

A. Yes, but I must say that in the meantime we had advised that before Textile be given a supply the 2 customers be provided with Yorkshire fuses.

Q. Was the supply given to Textile on the 1st June?

A. Yes.

Q. Do you add a third line to your installation? Textile is a separate line?

A. I connected Textile on Ideal Printing by adding 3 new fuses.

Q. You already have 3 Yorkshire fuses for Ideal Printing 3 for Southern Cross and do you also provide Textile with fuses?

A. Yes.

At this stage the case is adjourned to Monday 6th March, 1978 for continuation.

6th March 1978

Monday 6th March, 1978

Mr Juste examined by Mr Raymond Hein QC

Q. On the last occasion, I was just starting to question you on the visit which you made with Mr Jean to the spot on the 26th May 1972?

A. Yes.

Q. Did you on that day go together with Mr Jean or separately?

A. With Mr Jean.

Q. In which direction did you go?

A. When we left Poudriere Street, we went to Bata.

Q. You went to Bata in which vehicle?

A. Near Bata's yard.

Q. The distance is not important. What did you yourself do?

A. I got down and the workmen were waiting in the van for Bata's store to open. I myself went to Ideal Printing and the supply was off there and at Southern Cross Diamond. I went there and inspected the installation.

Q. Which one first, Ideal Printing or..... (Southern Cross)?

A. Ideal first.

Q. What did you notice at Ideal Printing?

A. I asked the foreman whether everything was OK there and he said yes. From there I went to Cross Diamond. There's a double door there. The first door was opened then the second. I asked whether the electric supply was off. I was told that it was off. A few minutes later I saw a flash in cross Diamond building, between its meter and its switch.

Q. You saw a flash somewhere between its meter and its switch inside the building?

A. Yes.

Q. What did you do?

A. I realised from where I was that the fuse had again blown over there. I left Cross Diamond and went to Bata to see Jean and the workmen.

Q. Once you were at Bata, what did you do? What did you see?

A. Jean and the workmen were still at Bata. I told them that there was a fault on the other side, meaning Cross Diamond.

COURT: Who said that? You?

A. Yes, me.

Q. Did you yourself enter the building to see what was being done, what was being repaired?

A. I went towards them to tell them that, because they were engaged in repairing.

Q. Did you witness the repair works?

A. No.

Q. What next, then?

A. We came out, Mr Jean, the workmen and myself. We went to Bata. We went to Cross Diamond to attend to that fault.

Q. You went out with Mr Jean and the workmen too?

A. Yes.

Q. All the workmen?

A. There were only two.

Q. And why did you go to Southern Cross?

A. To see about that fault.

Q. Did you see it.

A. Yes.

Q. What was done next?

A. We disconnected Cross Diamond's installation

in the meter.

Q. Yes, then?

A. Then we effected the repairs. We went outside.

Q. You said there were 2 workmen, do you remember their names?

A. Mungroo and Carrim, his assistant.

Q. After the disconnection, what did you personally do?

A. I stayed outside. Workmen Mungroo and Karim were handling the fuse under the supervision of Mr Jean.

Q. Then?

A. Then they left again and went to Bata. I stayed outside waiting for Jean.

Q. Did you stay there long or did you leave afterwards?

A. No.

Q. Once the repairs were over, you left with Jean?

A. I went to Printing.

COURT: When did you leave Bata's premises?

A. Yes when I left Bata's premises.

Q. Did you go and do some other things or did you return to the office to make a report?

A. When we left, Mr Jean and myself returned to the office.

Q. Was the report to the employee who keeps the book made by you or by the workmen who did the repairs?

A. It's the workman who makes his report to the force attendant.

Q. You mentioned the force attendant. Is there only one force attendant? I can see different handwritings?

A. Sometimes when he has to be away to make phone calls or to send out a message, a clerk replaces him.

Q. It's not an electrician?

A. There's a clerk in the office.

Q. It has been said that, on that day, there was a rather serious fault because the terminals of the (fuse) carriers had been damaged when the carrier was being fixed back into the fuse box. This has been said, but you have said that you were not inside, so that you were not able to see whether this was true or not. I am going to ask you

something as an experienced officer. How long have you been in the service?

A. Almost 42 years.

Q. Had you been in presence of a damaged fuse terminal, what would you have done?

A. I don't quite understand.

Q. Assuming that you had been in the place of Mungroo or Karim and that you had been in presence of damaged terminals in the fuse carrier, what would you have done?

A. I would have reported the matter to the section which deals with fuses, that is the engineering section.

Q. Now about repairs to the fuse. The fuse base is that part in the gadget the carrier is clipped into. What would you have done to repair that base? What would be required to be done?

A. According to the engineer, the supply had to be cut. The base itself or else by the transformer on the pole.

Q. The current coming from the transformer supplied electricity to how many industries?

A. About a dozen.

Mr Juste this is all I myself had to ask you.

Cross-examined

Xed by Mr Marc David QC

Q. Mr Juste you have just said that you reckon 42 years service in the field of electricity?

A. Yes.

Q. No comparison can be made between you and Mr Jean. If one of you is an expert in electricity, it's you and not Mr Jean?

A. At the CEB he is my boss. He has more authority.

Q. Who is more experienced in electricity you or Mr Jean?

A. You should not compare.

Q. Let's immediately come to the 26th May. Why did you accompany him on that day?

A. He usually asks me or an inspector to accompany him on his rounds.

Q. Because he wants you to be available to say what needs to be done and to discuss things over with you?

A. Sometimes he seeks my views.

Q. So Mr Jean does want you to be with him. Now on the 26th May immediately you arrive at Bata Mr Jean and yourself each goes in a different direction: Mr Jean goes inside and you go to Ideal Printing and Southern Cross?

A. Yes.

Q. When you left the CEB the fault reported was said to have occurred at Ideal Printing and Southern Cross?

A. The two industries had no supply.

Q. The whole team did not go to Ideal Printing and Southern Cross first, but you went there while Mr Jean and the workmen went to Bata?

A. Yes.

Q. When you went to Ideal Printing and Southern Cross, did you have any tools in your possession?

A. I normally carry my tester and there are other tools in my car.

Q. You were told at Ideal Printing that the fuses were in order?

A. That all was OK there.

Q. What do you mean by OK? The fuses were in order and the electric supply was on?

A. They had no supply.

Q. They had no supply and all was OK. Did you try to carry out a test or make some check or other at Ideal Printing?

A. When they told me that I thought that the fault was elsewhere, meaning first that the fuse had blown.

Q. You knew that the fuse had blown? Where?

A. At Bata, because both had no supply.

Q. But you didn't check or test anything at Ideal Printing?

A. No. I accepted the words of the foreman.

Q. Then you proceed towards Southern Cross. Did you speak to the foreman there, before the flash, or to any other official?

A. I talked to the foreman about the supply which was off. I had hardly finished talking to him when I saw the flash.

Q. What sort of flash was it? What caused that flash?

A. A short circuit.

Q. Two wires making contact? You said the flash was between the meter and the switch?

A. Yes.

Q. Was it the right thing for Mr Jean and the workmen to place back the fuse before you had reported what you had seen?

A. I can't answer.

Q. No. But would you have done the same thing?

A. If I were him I would perhaps have acted differently.

Q. You mean that you would have waited that the fault be traced and repaired before placing back the fuse?

A. Perhaps.

Q. This is the way, Mr Juste, you would have proceeded, wouldn't you, Mr Juste?

A. Yes.

Q. It was, to say the least, imprudent on the part of Mr Jean to have done what he did-

A. It was not imprudent.

Q. What would you say it was, then? Putting the cart before the horse?

A. No. A fault occur for different reasons in electricity. There may be a contact, or an overloaded fuse, I mean too much electric current on one side.

Q. So when you saw that flash, did you realise that the fuse had again blown at Bata?

A. No I immediately went towards them.

Q. You went inside, did you go into the room where the Henley box was?

A. No. Very near.

Q. But you didn't enter that room? Who allowed you into the store?

A. It was open.

Q. Was there a Bata employee present?

A. I don't remember.

Q. How were Mr Jean and the workmen able to enter into the store?

A. As I said, they were waiting for a Bata employee to open the door.

Q. Did you go before he arrived?

A. Yes.

Q. So you left before. Mr Jean went into the building, and when you returned, after the flash, you say that the outside door of the

store was open and you could go into the store?

A. Yes.

Q. And the Bata employee was not at the door to walk you in?

A. No.

Q. You walk up to just outside the room where the Henley box was. Did Mr Jean then tell you what had happened outside?

A. No. When I arrived I said that there was a fault on the other side.

COURT: To whom?

A. I said so to Mr Jean.

Q. You tell Mr Jean but Mr Jean does not tell you anything. He didn't tell you what had happened inside with the Henley box?

A. We go outside.

Q. You go outside, you. Mr Jean and the two workers, you go to Southern Cross?

A. Yes.

Q. Did the workmen have anything in their possession?

A. The workmen normally have pincers and a screw driver in their possession.

Q. Did you notice anything else with the 2 workmen?

A. Mungroo had a fuse.

Q. You went to Southern Cross with that fuse. What did you ask about that fuse.

A. We went directly to Southern Cross.

Q. You didn't ask any information about that fuse? What did you do at Southern Cross? Did you cut off its supply?

A. We disconnected its installation in the meter.

Q. At that spot where the flash had occurred, was any repair done to that spot?

A. Not immediately.

Q. Was it done at a later stage?

A. Yes.

Q. When?

A. In our absence.

Q. By whom?

A. By Southern Cross employees. I can't say whether it was the foreman or whether they

had called in an electrician to do the repairs.

Q. After the repairs who gave back the supply? Who authorised the reconnection?

A. We left after disconnecting the wire in the meter. After we had done the repairs we went away and left Southern Cross without electricity.

Q. When did you give the supply to Southern Cross?

A. When we were back at the office, Mr Jean decided to check every outside installation, that is.....

Q. The Yorkshire?

A. Yes.

Q. When was the supply re-established at Southern Cross?

A. After placing the yorkshire.

Q. Who gave orders to re-establish the supply at Southern Cross?

A. I did.

Q. This is not what I wanted to ask you, Mr Juste. You gave the orders, but before giving the orders did you go to the spot?

A. Yes.

Q. Did you check whether Southern Cross had made the repairs?

A. Yes.

Q. What sort of repairs was done?

A. Cables had been replaced from the meter to the fuse box.

Q. Did Southern Cross itself undertake those repairs?

A. Yes.

Q. How did that short circuit happen? What was the cause?

A. Wires making contact.

Q. Two isolated wires?

A. Yes, but these things happen.

Q. Why?

A. A bungled job.

Q. Did you inspect the work done by Southern Cross before connecting the supply?

A. It was a provisional installation. There was only the cable running from the meter to the box.

Q. Did you check that installation?

A. Yes.

Q. You said that it was a bungled job. Why?

A. When the workman stripped the wire to remove the insulating material, he must surely have overdone it and the wires made contact.

Q. What did you do before you released the electric supply? Did you check the insulation of your installation, i.e. the cables from Southern Cross to Ideal Printing and going inside the Henley Box? 10

A. The cables outside went overhead and this is where they went into the meter. Yes, I did.

Q. So you did not check and verify from Southern Cross to Ideal Printing and right up to the Bata building?

A. No. You just look but you don't see anything.

Q. Did you check inside Bata building? If so, from where to where? 20

A. To do that from Southern Cross, the supply had to be cut.

Q. I am asking you, you say that you checked inside Bata building? From where to where did you check? Did you check the cables where they came into Bata building?

A. Where there are connections.

Q. You checked near the box? Did you check the cables in the room where the wires, the cables went in? 30

A. Yes, obviously. The box is there, the connections through the bi-metal is between 1½ to 2 feet, it had to be seen.

Q. Did you also check at the top?

A. No.

Q. You only checked from the bi-metal connector to the box?

A. Yes.

Q. The bi-metal connector.....

COURT: When did you check that? 40

A. On the day we went there and fixed the fuse at Bata.

Q. At what time?

A. One afternoon.

Q. At what time?

A. I don't remember.

Q. After 4?

A. No. We didn't do any overtime?

Q. You can't say at what time this was done?

A. No

Q. Wasn't the bi-metallic connector fixed to the wall?

A. No. Because there was a space between the box and the wall

Q. Meaning that, if I understand you well, the cable hang loose from the ceiling down to the Henley Box without being fixed to the wall? And at a certain point on the cable you get the Bi-metallic connector? Is that correct?

A. The vertical part coming down from the ceiling was tied into a bundle with tape.

Q. At the top it was in a bundle, but that bundle was not fixed to the wall?

A. It's such a long time, on the horizontal side

Q. I'm not talking of the horizontal side, Mr Juste, but of the vertical side?

A It touched the wall.

Q. Was it fixed to the wall?

A. It could have been fixed at the top, but it was hanging down

Q. Was it hanging down freely and the.....

COURT: You explained just now that the cable was not fixed to the wall because.....

A. Up to a certain height, but higher up 7 feet higher up (it was).

COURT: When you were asked whether it was fixed to the wall, your answer should have been: the cable was fixed to the wall up to a certain point but afterwards it hang down freely.

Q. From the ceiling downwards it was fixed to the wall over what length?

A. About 5 feet down to the bimetal connection, i.e. a little bit above the bi-metal. The bi-metal is sufficiently high, isn't it?

Q. Yes, but the bi-metal was hanging down freely. What length of the bi-metal was hanging free?

A. About 5 or 6 feet.

Q. Can you tell the Court to day if even from the ceiling there were clips over a certain length?

A. I can't say.

Q. Did you check that cable that ran from the ceiling to the bi-metallic connector?

A. I had a quick look at it.

Q. You had a look with your bare eyes. Did you test it from the bi-metallic connector to the Henley or did you look with your bare eyes?

A. With my bare eyes.

Q. Did you try to test the current which went through the various phases and the neutral on that day?

A. No. Only the testor was used to check whether there was any current.

Q. Did you try to measure the load, the current which ran through the various phases?

A. Not with a voltameter.

Q. You could have easily used a voltameter?

A. Yes.

Q. Weren't you worried? Didn't you try to make sure?

A. No.

Q. Did you handle the Henley Box that afternoon?

A. I don't normally handle anything. It's the job of the workman.

Q. You can't therefore tell the Court anything about the temperature of the box?

A. No.

COURT: When you said you made certain checks, you meant checks made by your workmen in your presence? You say you don't handle anything.

A. Yes.

COURT: Certain things can be checked by just looking at them, others have to be handled?

A. But the workmen check with their testors.

COURT: This is what I am saying. You check through your workmen's eyes, through him or rather through his hands. You mean to say that you are there but it's workman who does the testing?

A. Yes.

Q. As regards the insulation of all those cables, of the whole installation did you ever use any apparatus for testing them? There are tools for that sort of thing. For example, to test the cables, there's the megger, ever heard of a megger?

A. Yes.

Q. Did you use a megger to test the installation?

A. No. There were no installations.

Q. On the 26th May. I'm talking about the 26th May, did you use a megger?

A. No.

Q. Now back again to the 26th May. Mr Jean took you with him. He likes you around but on that day you didn't enter the room where the Henley Box was?

A. I came to say that there was a fault on the other side.

Q. But you stayed outside the room? You didn't go in?

A. I did go in.

Q. You went into that room?

A. That room where the box is near the door.

COURT: You are asked if you entered that room? Yes or No?

Q. You went in the corridor or did you enter the room?

A. No.

Q. You didn't enter the room?

COURT: Don't take a quarter-hour to answer.

Q. You move from there, you go and cut the supply and when the four of you, Mr Jean, yourself and the two workmen, return from Southern Cross after cutting the power, you go towards Bata?

A. No. The 2 workmen and Mr Jean went towards the van to clean the fuse. I stayed outside.

Q. Yes, and where did you stay?

A. Outside.

Q. Outside, you mean in the yard?

A. Outside near the van.

Q. You left them on their own?

A. Mr Jean is competent enough.

Q. So you didn't have to deal with this, and when they had finished, Mr Jean and the 2 workmen went back inside to replace the fuse and you stayed outside. You didn't go in. Did you have any reason for your attitude, Mr Juste?

A. As I have said Mr Jean is competent enough and then there shouldn't be too many top officers for a mere replacing of a fuse.

Q. If someone were to say, and someone did say, that you were inside that room on that day, that wouldn't be true?

A. It would not be true.

Q. Did you see the Bata employee on that day?

A. No.

Q. When you came back you said that you left for Southern Cross with Mr Jean and the 2 workmen, when you came back you stayed there and saw the Bata employee?

A. No.

Q. You mean that the door was open and that Mr Jean and the 2 workmen were free to go in and out as they wished?

A. Yes.

COURT: They could have removed goods, gone out and placed in the van.

A. That's actually the work of the Bata man.

COURT: When you went in to see Jean anybody could have just walked in, taken the goods and removed them to his car without being stopped by anybody? The first time you went to see Jean, you didn't see anyone?

A. I didn't meet anyone. I don't know where the Bata man was.

Q. Do you have another reason, apart from the fact that you didn't go in because Mr Jean is competent enough and could carry on on his own? Is that your answer?

A. Yes.

Q. How many times did you call on Bata on that day? Do you remember?

A. 4 or 5 times.

Q. Mr Juste, did Mr Jean give you any data about Ideal Printing's consumption for the months of July and August, 1972?

A. No.

Q. Tell us please, Mr Juste, the cables entered the Bata building or rather came out of the Henley Box, reached up to the ceiling and then travelled horizontally, went through the wall separating the two rooms? Is that correct? You have 2 rooms: the room where the Henley Box was and the adjoining room?

A. But it came out directly from the Henley Box.

Q. Reached up to the ceiling and ran directly away. But where it came out, did it cross the wall?

A. Yes.

Q. At that point there, did you have anything to fix it? Sleeves, for example?

A. No it's a big hole. The cable was quite free.

Q. There were no sleeves or anything. Please tell the Court how the installation was made in the beginning in between the 3 phases and the neutral. If I got you right,you stripped the cable and then you had the wires inside What did you do with them?

A. The insulation had been removed. The small wires were taken one by one and connected (?) to the second independently. This went on up to the neutral and from there the insulation was removed sufficiently to make the three (?).

Q. At one point there were six wires.....in which the six wires..... it was the same thing (??)

Specimen shown - Bimetallic connector

COURT: You had 3 like those?

A. Four

COURT: One for the neutral and one for each phase. So there were 4 of those?

Q. Now then, Mr Juste, when the installation was put up first for Southern Cross, next for Ideal Printing and finally for Textile, did Mr Jean discuss things with you before deciding to give a supply to those customers?

A. He discussed with the engineer.

Q. Not with you. Did you know that originally there were 18 SWG wires in the Henley box?

A. Yes.

Q. Did you know that finally those wires were doubled?

A. Some time later, yes.

Q. You seem astonished, Mr Jean?

A. When, do you mean?

Q. This is precisely what I am asking you. Do you remember that at one time the wires were changed? When did you learn about this?

A. Long after Textile was given it's supply.

Q. Did you learn that at one time the wire had been changed?

A. Mr Jean told me so.

Q. In your opinion, did this doubling of the wire constitute some danger, some risks?

A. Not at all.

Q. So you didn't warn Mr Jean about the possiblity of some danger? He tells you that the wire in the fuse box had been doubled and you think it was absolutely normal?

A. Because the users installations were monitored by external fuses.

Q. So in your opinion there was no harm in doubling the wire inside the unit? That's what you say?

A. Yes.

Q. And you have not therefore cautioned Mr Jean against this?

A. If I had done so, he might have.....

Q. Would you yourself have taken such a decision? You, Mr Juste, would you have assumed the responsibility for this doubling, knowing that the unit was a 60 amp.?

A. It could have stood more, twice that figure, 120 amp.

COURT: It's made to take 60 amp. but it could stand 120?

A. Because the base is strong.

Q. So it's a 60 amp. but, as its base is strong, it could stand 120. You would have found it normal to double the wire in order to raise the rating of the box? You, Mr Juste, you don't see anything reprehensible in it? I am asking you, Mr Juste, you are a man with 42 years' experience, whether you find anything reprehensible in the decision taken?

A. No.

Q. Did the unit serve any purpose?

A. Yes.

Q. What purpose?

A. Because the cable coming from the pole where the transformer was and which had already been connected served to distribute the supply to the other consumers.

Q. And that was its purpose?

A. Yes.

Q. Did you attend site meeting at Textile with Mr Jean?

A. I don't quite remember. It's such a long time ago.

Q. Before Mr Jean gave the supply to Textile, did you attend a site meeting with Mr Jean there?

A. I don't remember. I may have attended.

Q. Have you ever inspected Textile's machinery?

A. There was nothing, no installations, except a fuse and a hanging wire leading to the meter.

Q. And the machines?

A. There were a few machines at the workshop.

Q. Was it a provisional installation?

A. Yes.

Q. Would a provisional installation, when in use, require less precaution, more precaution than, or as much precaution as, a permanent installation?

A. Precautions are always necessary

Q. Would a provisional installation require less or more precaution?

A. The same precautions should be taken.

MR DAVID: I do not think I have further questions, My Lords

COURT: Tell me Mr Juste, here you have a yorkshire which is a safeguard for the 3 consumers, or rather a safeguard for the Henley against the consumers, a safeguard for the installation of individual consumers. After the 26th May, a yorkshire fuse had been installed for each consumer; Textile, Diamond and Ideal Printing. Why does the Henley fuse blow? Was the yorkshire more resistant than the Henley? What actually happened? Are you with me? 3 yorkshires for 3 installations and a Henley to safeguard the 3 installations together. The 3 fuses are in place, why does the Henley fuse blow?

A. This should have blown only one of the three.

COURT: I don't know about "should have blown". I am asking you why did the Henley blow? Answer me if you can.

A. It should not normally have blown, but it did blow.

COURT: Wasn't the CEB worried? Weren't you yourself worried about this?

A. I mean the fuse blew because of the overload.

"Textile fuse and the fuse on the other side, the two together, individually, but the whole load was sustained by the box. The fuse of a consumer came to be overloaded, that is to say it was taking in more power than it should. The other fuse too but not to such an extent as to blow the yorkshire. The other consumer too had an overloaded phase but it was not its fuse. The entire load converged on to the fuse in the box".

COURT: The result was that there was an overload on the box?

A. This caused the fuse to blow.

COURT: If I get you right, there was an overload on each yorkshire individually, but that was not sufficient to blow the yorkshire, but the sum total of the 3 overloads was sufficient to blow that yorkshire?

A. Yes.

COURT: One other thing. You detected the fault at Diamond and you say that it was located between its meter and its switch. How is the installation there? Did the cable enter the switch first or the meter?

A. The cable goes directly into the meter.

COURT: You have the meter and then the switch?

A. To control the consumers' installations. If the fault was beyond it would have blown the consumer's fuse, but if the fault is before the fuse, it blows the Henley.

COURT: If the consumer has todo certain repairs do you have to cut off the supply?

A. If the repair has to be done, the consumer switches off.

COURT: Any repair work that has to be done down to the meter, that is your concern? And from the meter to the switch, it's the consumer's concern. And if he has to carry out any repair it's you who have to cut off the supply?

A. The CEB has to authorise it first and he pays a fee for it.

Re-examination (Translation)

Re-examined

SIR RAYMOND HEIN Q.C.

Q. The Court just asked you this: There is on each yorkshire fuse an overload which is not big enough to blow each individual fuse but, taken together, they caused the fuse of the Henley Box to blow? Did you well understand the Court's question?

Assuming that there was an overload on, say, the Southern Cross Yorkshire, an overload on the 18 SW of the Yorkshire fuse of Southern Cross, would it have blown?

A. Not necessarily. This fuse does not blow easily, but two overloads.....

Q. What do you understand by an overload?

A. An overload is power in excess.

Q. In excess of what?

A. A 30 amp fuse can accommodate a little more than 30 amp. In an overloaded fuse, the 30 amp. can rise to 35 or 40 amp.

Q. The Court asked you whether it was possible that the fuse did not blow although there was an overload? Would a 30 amp. fuse which is made to take 40 blow or not?

A. As I just explained to the Court, the 2 overloads together yes, but an overload of say 1, 2 or 3 (amp) is not enough to blow an individual fuse but enough to blow the fuse here.

Q. The two together would make up a much more powerful load.

A. Much more powerful than the Yorkshire.

Q. My friend just asked you whether it was not imprudent to replace the fuses in the box, while you were at Southern Cross or at Ideal Printing to find out the most recent faults, whether it was imprudent to replace the fuse, and you said no. You think that it was not imprudent. If Jean or Mungroo had not replaced the fuse, could you have detected the fault at Southern Cross?

A. Immediately, no.

COURT: Your answer is incomplete; immediately no but a bit later yes.

A. The fault had to be looked for.

Q. The fact that the fuse carrier produced a short circuit in the Henley, you get a short circuit there and you located it immediately. The Court just pointed out that you said "immediately, no". Did you locate the fault immediately?

A. Yes.

Q. All right, but could you have located it subsequently?

A. I would have had to check the installations at Southern Cross and at Ideal Printing individually to find out which of the two had a fault.

Q. Was it possible?

A. Yes.

Q. The fact that the fuse carrier was placed back enabled you to detect immediately the fault existing between the meter and the switch?

A. Yes.

Q. Up to what point does the CEB's responsibility extend as regards a client's installation?

A. Up to the meter.

Q. The installation between the meter and the switch is under whose responsibility?

A. The client's

Q. You are aware of the procedure when a fault occurs in a client's installation between the meter and the switch.

A. The client is asked to do the necessary repairs.

Q. You must have had to deal with such cases when you were a workman, before you came to your present position. What do you do when in the course of inspections you find that there is a fault in a client's installations between his meter and his switch?

A. The client has to advise us when he has completed his installations. But the client has no right to touch our meter. The connection in the meter for the release of the supply is our responsibility.

Q. If after making a call you find that the fault has to be repaired by the client, do you know what should be done?

A. The client must pay.

R E C E S S

No. 36

EVIDENCE OF ISMAEL MUNGROO

Monday 6th March, 1978
Bata Shoe Co. & Anor. v. CEB

AFTER RECESS

Mr Hein (Jr) calls and examines Mr Ismael Mungroo (SAM)

Q. Do you know Bata building in which there was a fire in 1972?

A. I know the Bata building in which there was a fire in 1972.

Q. How often have you been there?

A. I have been there on two occasions.

Q. When did you go there for the first time before the fire?

A. The first time I went there before the fire was in May.

Q. After doing your work at a certain place, you returned to the office and made a report. To whom did you make the report?

A. When I return to the office I make a report which is written down in a book.

Q. I see Mungroo and Carrim on 26th May?

A. If it is written in the book that I went there on the 26th May, this is so..I went with Carrim.

Q. Who is Carrim?

A. Carrim was my assistant.

Q. Is he still alive?

A. He is now dead.

Q. Apart from Carrim and yourself, who else went there?

A. I and Carrim went there in the CEB van. Mr Jean and Mr Juste came by car.

Q. Was Bata open when you arrived?

A. On reaching there the Bata building was not open. Mr Jean had been to see a personnel of Bata to open it.

Q. You and Carrim went there and shortly after Mr Jean and Mr Juste came?

A. I and Carrim went first then Mr Jean and Mr Juste arrived.

Q. The man who opened the door at Bata came before or after the arrival of Mr Jean and Mr Juste?

A. The man who opened the door arrived after the arrival of Mr Jean and Mr Juste; he opened the door.

Q. Who entered the Bata building?

A. Mr Jean went inside the building and Mr Juste remained outside.

Q. You went inside and where did you go?

A. Inside we went to where the henley fuse box was

(Witness is shown the log book of the CEB)

Q. You see the report here, what is written down in the CEB log book?

A. In the entry in the log book it is written that two phases were missing.

Q. Ideal Printing?

A. There is an entry for Imprimerie Ideale also, it is not said what had happened there.

Q. Who went to the fuse box?

A. I went to the fuse box together with Carrim and Mr Jean.

Q. Where was the Bata employee?

A. I did not notice where was the Bata employee.

Q. You entered and went to the fuse box. Did you have easy access to the fuse box?

A. We had easy access to the henley fuse box.

Q. What did you do then?

A. There I undid the two bolts of the fuse box with the help of pliers. Then with the help of my testor I verified what fuse was in order and what had blown.

Q. How many were in order and how many were not?

A. Two fuses had blown.

Q. What did you do then?

A. I removed the two fuses, brought them outside to repair them. I brought them near the van.

Q. You replaced them and what did you do next?

A. After exchanging them I returned inside to replace them.

Q. What sort of fuse was there in the fuse box?

A. There was a 17 (?) fuse wire in each fuse box. I replaced them by fuse wire No.18. A single wire in each.

Q. You took them and went near the van to repair them. What did you do next?

A. I replaced the fuse one at a time, I placed the first fuse carrier; all went well then I placed the second one, after a few moment it blew.

Q. When it blew, what did you see? Did you see anything?

A. I did not see anything when the fuse blew.

Q. What did you do?

A. I removed the fuse carrier.

Q. What happened then?

A. Mr Juste came along and asked us not to replace the fuse carrier as he thinks there was a fault at Diamond Co.

Q. Where was Mr Juste when he told you that?

A. Mr Juste was near the door of the store where the van was when he talked to us.

Q. What did you do then?

A. He said we would replace the fuse after he had given us the order to do it.

Q. Did you do anything? Did you all stay there?

A. I went to the van and there repaired the fuse.

Q. What did Mr Jean, Carrim and Mr Juste do?

A. I do not remember what Messrs. Jean and Juste did and Carrim also at that time.

Q. You said that when the fuse had blown you removed it and went near the van. What did you do?

A. Near the van I replaced the blown fuse.

Q. What sort of wire did you use?

A. I replaced it with fuse wire No.18.

Q. Somebody said here. ..... how do you call those two things (both sides of the carrier)?

A. That's its blade.

Q. When you removed it, was there anything on the blade? The fuse then blew, the first time it was removed and was replaced. You say that the fuse blew and that you removed it, was there anything on the blade?

A. After the fuse had blown the base at the top was somewhat black. The top terminal of the fuse carrier was somewhat darkened.

Q. What did you do?

A. I cleaned it using waste and then rubbed it with sandpaper. I placed some grease on it as well.

Q. This is the "male" part. The "female" part is inside. Was there anything on the "female" part?

A. The fuse base also was somewhat darkened, I cleaned it with the waste. I used my screw driver.

Q. What did you do next? Did you replace it?

A. When Mr Juste gave the order I went inside along with Mr Jean to replace the fuse carrier.

Q. After replacing the fuse, what did you do?

A. Then I closed the door of the henley fuse box, screwed the bolts with the help of the pliers.

Q. The first time was in May, the second time was how long after?

A. The second time I went to Bata building was some four weeks before the fire, but I do not remember exactly.

(Witness is shown the log book)

Q. Can you see the date?

A. On the 5th July 1972.

Q. From the log book what was the time you went there?

A. According to the book it was at 13.50 hours.

Q. Did you go alone?

A. I went there along with Carrim.

Q. What work did you do on that day?

A. On that day there were many consumers who had no electricity supply in the vicinity of Bata building. We had received orders that if the fuse in the henley box should blow to replace it by two wires No.18.

Q. When you went there, who was out of supply?

A. Imprimerie Ideale, Diamond and Textile had no electricity.

Q. The book indicates what sort of breakdown?

A. The entry regarding the region indicates that there was no light.

Q. Were you able to go in once you were there?

A. The Bata employee opened the door and we went in.

Q. You went into the room of Bata?

A. We went into the room where the henley fuse box was.

Q. What did you do?

A. I opened the door of the fuse box by undoing the bolts and I tested the fuses.

Q. What did you find?

A. I saw that one fuse had blown.

Q. And what did you do?

A. I brought it outside and replaced the blown fuse by twofuse wires.

Q. Of what type was the fuse which blew?

A. The fuse which was blown up at first had one wire No.18 fuse wire, I replaced it with two No.18 fuse wires.

Q. Did you check its blade (terminals)

A. I did not notice the terminals.

Q. After changing the fuse wires, what did you do?

A. After that I replaced the fuse carrier, I closed the fuse box and went out to check the electric supply of the consumers.

Q. How did you close the box?

A. I closed the door and then screwed the two bolts.

Q. Could you close it easily or did you have any difficulty?

A. There was no difficulty in closing the door.

Q. If you had some difficulty closing it, what would you have done?

A. If I had any difficulty in closing that door I would have reported it to the office.

Q. When you returned you made your report and had it recorded in the log book?

A. That report would be written down in the log book.

Q. Is it your duty to repair boxes?

A. It is not my duty to repair such boxes. It is the responsibility of the engineering department of Plaine Lauzun.

Q. When the fuse was replaced there was a single wire and it blew and you replaced it by 2/18. Did you close the box?

A. I am positive on that day after I had replaced the fuse wire that had blown down by two fuse wires No.18, the door of the henley box closed without difficulty.

Q. You effected the repairs and returned to the office or did you attend to several jobs in the office? See the reading of the mileage when you left and the time you returned.

A. On that day we attended to many faults one after the other before returning to the office and when I made my report all those faults were mentioned.

Cross-examined

Cross-examination (Translation)

Xed by Mr David:

Q. Was it the first time you went there on the 26th May?

A. I went there for the first time on the 26th May.

Q. You entered when Mr Juste and Mr Jean arrived. Was it the Bata employee who opened the door to let you in?

A. It was the Bata employee who opened the door to let us in.

Q. Once you were in what did the Bata employee do?

A. I did not notice while we were in what the Bata employee did, I was busy with my job.

Q. Didn't you notice him in the room there with you?

A. I did not notice him in the room with us.

Q. When you said the first time, that you had to change the fuse, you were out. Didn't you see the Bata employee?

A. When I went there for the first time to change the fuse wire I did not notice where the Bata employee was.

Q. You mean to say that the door of the store was open for you to go in and out as you pleased. How did you manage to go out?

A. I went out through the same door which was open. The door was open while we were inside working.

Q. Are you telling the Court that you did not notice when the Bata employee was?

A. I do not remember where the Bata employee was.

Q. Didn't Mr Juste enter with you?

A. When I went in Mr Juste stayed outside.

Q. You and Carrim were there, Mr Juste and Mr Jean arrived, then you, Carrim and Mr Jean went in. When you went in the others stayed outside?

A. When we went in Carrim Mr Jean and Mr Juste remained outside.

Q. When you, Mr Jean and Carrim went in, why did Mr Juste remain outside?

A. I cannot say why Mr Juste remained outside. I do not remember where he remained outside.

Q. When you all were in, you opened the box, checked it and found that the 2 fuses had blown?

A. When we went inside I opened the henley box and I noticed that two fuses had blown.

Q. One in each had blown, and you could see that or had it disappeared?

A. I removed the two fuse carriers and brought them outside.

Q. When you took the 2 fuse carriers outside, did you notice if Mr Juste was outside?

A. When I came out with the fuse carrier I did not notice Mr Juste outside.

Q. Was it you only who had anything to do with the 2 fuses? Were you the only one there?

A. Carrim also came out with me.

Q. Mr Jean stayed inside?

A. Mr Jean also came out. That incident is not very clear in my mind, it happened so long ago.

Q. You looked at the fuse outside, was the blown wire still inside or had it disappeared?

A. When I examined the fuse carriers outside I could see the pieces of the fuse wire.

Q. How was the wire? Was it broken or had it melted or what?

A. I think that the fuse wire had melted on a short length but I did not recollect that very much.

Q. So it had melted. Where? At its tip, in its centre?

A. I do not remember where it had melted whether in the end or in the middle.

Q. You then removed it?

A. I removed the pieces and replaced the fuse wire.

Q. Was the wire free? Or was it inside something?

A. The fuse wire was in a tube.

Q. And its colour? Was it normal or had it changed?

A. The fuse wire had changed colour.

Q. Can you tell the Court into what colour it had changed?

A. It is difficult for me to say what colour it had taken.

Q. How was the tube? Was it still all right or broken or what?

A. The tube was in good order.

Q. Then you changed it, you returned and placed a good one, then a second one, what exactly happened then?

A. It could be one minute after I had placed the second fuse that it blew.

Q. You had replaced it and you had removed your hand too?

A. I had replaced it and removed my hand from the fuse carrier.

Q. You had already closed the box?

A. I had not closed the door when it blew.

Q. When it blew did you observe anything?

A. When it blew there was no flash.

Q. When did you realise that it had blown?

A. In fact it produced a small spark when it blew.

Q. It was then that you realised that it had blown.

A. Then I knewthat it had blown.

Q. Then you removed it. When you removed the 2 fuse carriers, before going out to the van, did you clean them?

A. On the first occasion when I brought out the fuse carrier to the van I did not have to clean them, I just replaced the fuse wires.

Q. They had not blackened then?

A. I looked at them and they had not darkened.

Q. The second time, when one of the fuses blew, you removed it and went outside. Did you go outside alone or with Mr Jean and Carrim?

A. On the second occasion when I went out with the fuse carrier to replace the fuse I don't remember whether Carrim and Mr Jean came with me.

Q. On the second occasion you say that it had blackened a little at the top, that you cleaned it, using a bit of rag, sand paper and then grease. What sort of grease?

A. The grease I used came from a tube.

Q. Where were you when Mr Juste said that it was not necessary to replace the fuse? Inside in the room or outside near the van?

A. I do not remember where I was when Mr Juste asked that the fuse carrier be not replaced back, but I was outside.

Q. Had Mr Juste any reason for not going in?

A. I cannot say why Mr Juste did not come in.

Q. Did anybody at one time hear Mr Juste say that there was a fault at Southern Cross?

A. Mr Juste said that there was a fault at Southern Cross.

Q. Did you also go to Southern Cross?

A. I do not remember if I went to Southern Cross.

Q. Do you know today, now, what type of fault there was at Southern Cross?

A. I do not remember if I had seen with my own eyes what type of fault there was at Southern Cross.

Q. You stayed near the van with fuse?

A. As far as my recollection goes I remained near the van with the fuse carrier.

Q. The terminals of the fuse carrier had not melted? Not even one had melted?

A. The terminal of the fuse carrier had not melted.

Q. Who do you say gave the orders to replace the fuse carrier? Mr Juste or Mr Jean?

A. It could be either Mr Jean or Mr Juste who gave the order to replace the fuse carrier.

Q. When you opened the box on that day, did you have to use your pliers both on top and at the bottom?

A. To open the henley fuse box I had to use my pliers for both bolts.

Q. Did you or anybody else test anything in that box on that day?

A. Nobody on that day tested something in the henley fuse box.

Q. When you replaced the two fuses, you didn't know what sort of fault, if any, there was?

A. Mr Juste shouted not to replace the fuse carriers.

Q. Mr Juste did not shout the first time when you replaced the fuse carriers? You did not know what sort of fault there was?

A. When I replaced the two fuse carriers the first time I did not know where the fault was.

Q. When you left, the store was closed?

A. I did not remember when we left whether the store was closed.

Q. Back to the office you made your report. To whom did you make the report?

A. On reaching the office I did not make any report personally as I was in the company of two superior officers Mr Jean and Mr Juste who did the needful.

Q. On that day neither you nor Carrim made any report? The entry in the log book was made

on the strength of information given by Mr Jean or Mr Juste?

A. The entry made on that day was on information received either from Mr Jean or Mr Juste, Carrim also did not report.

Q. Mr Jean and Mr Juste say that later that afternoon yorkshire cutouts were placed. Did you have anything to do with the placing of those cutouts?

A. I was not involved later in the afternoon with placing yorkshire cutouts.

Q. You say that on the 5th July when you were leaving in the morning you had instructions to the effect that if a fuse were to blow you were to replace it by two. Was it the first time you had such instructions or had you been so told before?

A. Before the 5th July we had received instructions that in the Bata section if a fuse wire of the henley box should blow to replace by two wires No.18.

Q. On that day those same instructions were given to you?

A. Yes.

Q. When you arrived there on the 5th July, the supply for the three companies was off?

A. On reaching there there was no electric supply for the three companies.

Q. No supply because of a fault somewhere. When you arrived there on that day where did you first go? Directly to Bata or did you go to anyone of those consumers?

A. On that day as three consumers had no electric supply, on reaching there I went straight to the henley fuse box.

Q. Whether before, during or after, on that day you didn't go to the consumers at all?

A. On that day I did not go at all to anyone of the 3 consumers.

Q. When you went inside, opened the box and found that a fuse had blown, I suppose that you took it outside?

A. When I noticed that a fuse had blown I took out the fuse carrier and went outside.

Q. When you went with Mr Jean and Mr Juste two fuses blew. Was it the first and second, the first and the third, the second and the third, tell us which?

A. I do not remember when I first went there with Mr Jean and Mr Juste which of the fuses had blown.

Q. Do you remember which fuse blew the second time you went?

A. I do not remember which fuse had blown.

Q. I suppose that you removed it and took it outside near the van?

A. I brought out the fuse carrier to have the fuse replaced.

Q. How was the fuse wire when you looked at it? Had it disappeared; completely melted away, broken, how was it?

A. I do not remember in what state the fuse wire was when I looked at it.

Q. In what condition was the tube? You used the same tube?

A. I do not remember the state of the tube. I think it was in good order because I used the same tube.

Q. You said earlier that you did not notice in what condition were the two terminals. How were they?

A. The two terminals were in good order on that day.

Q. Then you changed the fuse wire and replaced it by two?

A. I replaced the blown fuse by two wires.

Q. How did you place the two wires?

A. I twisted the two fuse wires very well and then placed that in the tube.

Q. You returned it to the box and you fixed it?

A. Then I returned to the henley fuse box and replaced the fuse carrier.

Q. How did it fit in? Smoothly, Was it tight, or what?

A. The fuse carrier went in normally.

Q. Did it fit in loosely or tightly?

A. It went in tightly.

Q. The first time in May, when you fixed the second fuse wire which blew, how did it fit in?

A. When I replaced the second fuse on the first occasion it went in well.

Q. On the 5th July you opened the box, I take it that you tested it and found that a fuse had blown. Did you do any other check and try to find out why the fuse had blown?

A. On the 5th July reaching there I opened the henley fuse box, I noticed that one fuse had blown and I replaced it without checking the

installation to see why it had blown.

Q. You returned to the office and you yourself then made the report. Who wrote it down in the log book?

A. On our return to the office I gave the report to the switchboard attendant who made the entry. I told him that I had changed the fuse wire that was blown and replaced it by 2 wires No.18.

Q. Did he make an entry to that effect?

A. I cannot say if he made an entry to that effect in the book.

Q. You did ask him to note down that you had replaced the fuse wire by 2 wires No.18?

A. I am positive that I told him that I replaced the fuse wire by two wires No.18. An entry should be made accordingly.

COURT: You are a CEB workman. Have you ever come across copper terminals melting down as a result of a short circuit? Do you know of such an occurrence?

A. No. This cannot happen.

Q. You are saying that this cannot happen?

A. Yes it can happen but only when the fault is a particularly major one. (This may happen in case of an important short circuit).

No. 37

EVIDENCE OF FRANCE JUPIN

Mr Moollan calls and examines: Mr France Jupin (sworn)

Q. Do you know the henley fuse box at Bata building which supplied electricity to the 3 companies?

A. I know the henley fuse box which was installed at Bata and which supplied electricity to 3 companies.

Q. In June 1972, you worked in the repair gang of the CEB?

A. In 1972 I belonged to the section of fault repairs of the CEB.

Q. I see in the CEB book that on the 28th June 1972 you and one Aliphon attended to a fault at Ideal Printing?

A. If it is written in the book that on the

28th June I and Aliphon went to Imprimerie Ideale where there was a fault it is correct.

Q. That on the 28th June, about a week before the fire?

A. It was one week before the fire.

Q. When you arrived there, what did you do?

A. I went to Imprimerie Ideale and inspected the fuses. The fuse was in good order but one fuse was missing.

Q. A fuse was missing where?

A. I went outside and checked the yorkshire cut out, I saw that the fuse was in order but one fuse was missing.

Q. The 3 fuses were in good condition but one was missing?

A. All three wires in the yorkshire cut out was in good order but one phase was missing.

Q. What did you do then?

A. I asked for the key from Bata; when the key arrived the Bata employee opened the door I went in and opened the Henley box.

Q. How did you proceed to open the box?

A. We usually open the boxes with the help of pliers.

Q. Then what did you do?

A. I checked the henley box, one fuse had blown.

Q. How did you test it?

A. I checked it using my tester. I removed that which had blown off, I noticed that it had broken on the side and I replaced it with two fuse wires.

Q. You say it had blown on one side, can you explain where on one side?

(Witness is shown a fuse carrier)

A. It was broken near the terminal

Q. What did you replace it with?

A. It was only one fuse wire. I replaced it by two wires No.18.

Q. Then what did you do?

A. I replaced the fuse carrier and closed the henley box.

Q. How did you close the box?

A. I closed it with the help of pliers.

Q. Did you have any difficulty closing the fuse?

A. I had no difficulty in closing the box.

Q. Where were you when you replaced the fuse?

A. I replaced the fuse while I was inside the building.

Q. Apart from the blown fuse, how were the terminals?

A. Apart from the fact that the fuse had blown the terminals were in good order.

Q. You saw a No.18 wire and you replaced it by two No.18 wires. Why?

A. I placed 2/18 because there was the yorkshire cut out.

Q. What was there in the yorkshire?

A. In the yorkshire there was a fuse wire No.18 as in the henley box; for that reason it was necessary for me to change the fuse in the henley box and replace it with a stronger fuse.

Q. Which one was controlling the consumers' supplies, the yorkshire or the henley box?

A. Each consumer supply was controlled by an outside yorkshire cut out.

Q. What, according to you, had the henley box become?

A. The henley box had become a switch.

Q. You returned to the CEB?

A. Before going back to the CEB office I went to Imprimerie Ideale to see if the electric supply had been restored. I was informed that it had been restored.

Q. When you arrived back to the CEB was there someone near the telephone? Did you tell him anything?

A. On my return to the CEB office I said something to the person sitting near the telephone and he made an entry in the log book. I told him that a section had blown. I told him also that I had replaced by two wires No.18.

Q. You made that report to the man near the telephone, and did you also inform any other person?

A. I also informed the superintendent Mr Jean of the work I had done.

Cross-examination (Translation)

Cross-examined

XED BY MR DAVID: The Henley fuse box is of how many amperes?

A. I cannot say how many amps. the henley box can stand.

Q. You said that in the henley box there was a fuse with a No.18 in each. There were in all 9 yorkshire i.e. 3 sets. The yorkshire had 1/18 fuses, of what amperage?

A. There were in all 9 yorkshire cut outs arranged in 3 sets and No.18 fuse co carry a load of about 40 to 45 amps. I believe.

Q. The whole load was supported by the henley box whose amperage you do not know. Why did you fix 2 No.18 wires in that one?

A. If I go to a consumer where there are electric appliances of all sorts at his place and I notice that he has a yorkshire fuse of 22 and on the pole there is a fuse of 22, I feel bound to change the 22 on the pole outside 18, so that in future instead of the one on the pole blowing the one indoor would blow.

Q. Did do you know what load those 2 No.18 wires could stand?

A. To my experience fusing two No.18 wires it would not affect the henley box in any way.

Q. You are familiar with this; You do usually place 2 No.18 wires in the box?

A. I am not used to placing 2/18 wires as I did. It was the first time that I was doing it.

Q. Didn't you think advisable to seek instructions before doing this?

A. I did not think that it was necessary for me to ask for instructions before doing such a work. When a worker goes out he takes his responsibility and does the job he has to do; on his return he makes a report to that effect.

Q. What if there is a fault between the yorkshire and the henley box?

A. If there is a fault between the yorkshire cut out and the henley box the fuse in the box would blow.

Q. It would only stand to the extent of the capacity of the 2 No.18 wires?

A. But the fuse will stand the fusing capacity of 2/18 fusing wires.

Q. Did you try to find out by means of tests why that henley fuse blew?

A. I did not try to check or see why the fuse had blown. If the fuses in the yorkshire

are still in good order and the one in the henley box had blown out then it means that the fuse wire in the henley box should be strengthened.

Q. When you made your tests you saw that a fuse had blown, do you remember which fuse had blown? Was it the first, the second or the third?

A. I cannot remember which of the fuses blew, as it happened so long ago.

Q. When you removed the fuse carrier and examined it with a view to replacing it, were you in the room or did you go to the van?

A. I made the repairs in the room itself.

Q. You didn't have to go outside to the van?

A. There was no necessity for me to go out to the van.

Q. When you removed the fuse carrier and examined it, was the wire tightly fixed? Of what colour was it then?

A. When I looked at the fuse wire it had become somewhat red.

Q. Had it oxidized or what?

A. The load on it had made it become thus; the tube was in good order.

Q. The terminals were of what colour?

A. The terminals had their normal colour.

Q. Did you examine the cable which came out of the henley box and ran upwards?

A. I examined the wires coming out of the henley fuse box, they were in good order. We have to examine it and report if there is anything.

Q. Why did you examine it?

A. Whenever we attend to a fault we have to look at these wires.

Q. How do you examine it? Do you hold it in your hands and look at it?

A. We have to hold it to see whether it is hot or no. I held it up to a man's height.

Q. You noticed that one was apparently (loose). Did you think that the 2 others would also (come out) ?

A. When we attend to a fault where there are two fuses and only one had blown, we work only on that blown one. It is not necessary that if one has blown the two other fuses also should.

Q. You held the cable in your hands, was it hot? Was the henley box hot too?

A. The henley fuse box was of normal temperature as well as the wires.

Q. Besides the call you made at the end of May, had you been there before?

A. Somewhat long before, I had been there.

Q. For what purpose?

A. On that occasion two industries had no electric supply.

Q. You mean Ideal Printing and Southern Cross?

A. They were Southern Cross and Imprimerie Ideale.

Q. Blown fuses or what?

A. On that day the fuse wires were in order but two phases were missing.

Q. What did you do?

A. I asked for the key of Bata store, then I went inside.

Q. What did you notice at Bata?

A. In the henley box two fuses had blown.

Q. Did you report this?

A. I reported the matter.

COURT: He says: on the first occasion there were two phases missing, 2 fuses had blown out, I replaced them by same number 18 fuse wire then I returned to the office and caused an entry to be made in the book.

Re-examined

Re-examined by Mr Moollan:

Q. In May, when you went there, did you examine the fuse to see if they were in good order? Where were the fuses?

A. The fuses were in the box inside.

Q. What had happened to the yorkshires on that day?

A. The yorkshire cut outs had not been installed.

COURT: You were asked just now if you made any repairs on the first occasion. What sort of repairs did you make?

A. There were 2 fuses in the box, I went and removed them. There were two.

Q. On those two occasions when he went there, the Bata employee only opened the door; did he accompany him, did he close the door; what did he do?

A. I cannot say what the employee did.

Q. He did not accompany you?

A. I cannot say.

Q. When you went out, what did he do?

A. I do not know what he did, I finished my work and I went away.

No. 38

EVIDENCE OF MARCEL ROSALBA

Mr Hein calls and examines: Mr Marcel Rosalba (sworn)

Q. After attending a call from a customer, you make a report as to the place and the repairs done?

A. On our return from a job we always make a report of the work done and an entry is made in the book.

Q. On the morning of the 6th July 1972, the day of the fire, where did you go?

A. On the 6th July 1972, the day on which was fire at Bata in the morning I left the office at Poudriere Street, I went to Bata at Plaine Lauzun There was no key there and we returned to Bell Village for the keys.

Q. Did any employee of Bata accompany you?

A. Yes, an employee of Bata accompanied us.

Q. Did you have an assistant with you? Were you on your own?

A. James Louise of the CEB was in my company.

Q. What did he do?

A. The door was opened and we went inside the room to where the henley fuse box was.

Q. When you were in the room, what did you do?

A. I opened the bolts of the fuse box with the help of pliers, inspected and tested with a tester and I found that the fuse wire No.18 had blown.

Q. What did you do next?

A. I removed the fuse carrier.

Q. What sort of wire was in that carrier?

A. I removed the tube I saw that there was a wire No.18 in it.

Q. What did you do?

A. We returned back to the van and I asked Louise to stop the electricity supply of the three consumers connected to that box.

Q. How did he cut the supply?

A. To remove the yorkshire cut outs.

Q. You saw that the No.18 wire had blown. What did you do?

A. I replaced it outside with two No.18 wires, then I returned to the room in company of the employee of Bata, replaced the fuse carrier after making sure that Louise had cut the electric supply.

Q. When you had finished all that, terminals etc, you took them outside and you inspected its blade?

A. I inspected the terminals of the fuse carrier, they were in good order. I replaced the fuse carrier and then closed the door of the henley box with the help of pliers.

Q. When you went inside the room before starting the work, was the box closed or open, well closed?

A. When I first entered the room before doing the work the door of the henley fuse box was well closed and I had to use the pliers to unscrew the bolts.

Q. How did you close the box after completing the repairs?

A. When the work was over, I secured the bolts of the door with the help of pliers without difficulty.

Q. In that box there was a cable, a thick cable entering from the bottom and going out on top?

A. In the henley fuse box there are cables coming underneath the wires going out above.

Q. On that morning of the fire did you do anything to that cable which came out on top?

A. On the morning of the fire I did not work with the wires coming out at the top of the henley fuse box. I had not cut any piece to have it replaced.

Q. The wires were there for you to see, did you examine them?

A. I examined the wires, they were all in good order.

At this stage the case is adjourned to Wednesday 8th March, 1978, for continuation

Examination (continued)

8th March 1978

IN THE SUPREME COURT OF MAUTITIUS

On WEDNESDAY, the 8th day of March, 1978, at 10.30 am.

Before the Honourable M.Rault, Acting Chief Justice
the Honourable P. de RAVEL, Puisne Judge

MR HEIN RESUMES THE EXAMINATION OF:

MR MARCEL ROSALBA (sworn) Workman, C.E.B.

BY HEIN: On the 6th July, the day of the fire when I went to Bata in the morning I replaced the wire No.18 of the fuse by two No.18 wires because I had received instructions to that effect should a fault occur in that area. I replaced that in the henley fuse box. The entry in the book showed that on the 1st July, 1972, I repaired a fault at Textile Industries. The fuse of the Yorkshire cutout had blown and the terminal was somewhat darken. I went to the van, changed the whole fuse carrier and replaced the fuse wire No.18. I replaced it by a new fuse carrier.

Cross-examination

Cross-examined

BY DAVID: I have been working with the C.E.B. since its formation. I am 47 years old. It is not always when we go to a site of work to attend to a repair, for example, a blown fuse, that I personally gave instructions concerning the report of that work to be made in the log book. If we have been sent there by an inspector it is the inspector who does the report. If I have been sent by an inspector to do the work, after doing it I reported the matter to the inspector. I meet him in his office. I don't remember where the log book

was kept and cannot say whether it was in that office.

BY COURT: Although I am in the C.E.B. since its formation I do not know where the log book is kept because it is not always kept at the same place.

BY DAVID: If we have been given report of a fault by the employer in charge of the log book, on our return we report to him. When I do so the log book is with him. I have forgotten in what room at that time the log book was. I have forgotten in how many places the log book has been kept at the C.E.B. Office since I have been working there. I do not remember exactly when I received instructions concerning the replacement of a blown No.18 wire by a two No.18 wire whenever such fault occurs in that area. All workmen have been given such instructions. I do not remember who convened the meeting of all the workers to give them those instructions and who gave those instructions. I do not remember whether those instructions were given by an inspector, by Mr Jean or somebody else. I had received those instructions before setting out on the 1st July. I do not remember how many days before that I received those instructions. I do not remember if before leaving the office on the 1st July 1972 to attend to the request of Textile Industries concerning a fault that had led to a missing phase whether I received any instructions concerning the henley fuse. On that day I only went to Textile Industries and did not go to see the henley unit at Bata... When reaching Textile Industries I noticed that in one of the three yorkshire cutouts a fuse had blown. The fuse wire could still be seen though the fuse had blown. The fuse wire had broken but I do not remember if it was broken in the middle or near one end. I cannot say of what colour the fuse wire was when I saw it. On one side the metal part of the carrier had become somewhat dark. I would say that it was somewhat oxidized. I went to the van and replaced the fuse carrier completely by another one. Though I have seen a part oxidized I do not remember of what colour the fuse wire was at the time. When I saw that part oxidized I did not pay attention to the colour of the fuse wire. I cannot say why that part had oxidized. It is difficult for me to explain though I have experience, how that part can come to be oxidized. It is difficult for me to say, with my experience, what is the cause of the oxidization of a fuse. It is difficult for me to say. I do not know why it becomes oxidized. I examined the fuse base. The fuse base was in very good order and there was no sign of oxidation. I did not have to clean it.

I did not make any investigation on the installation to know why the fuse had blown. There is no tube for the fuse wire in a yorkshire plug. I do not remember to whom I made my report on returning to the office on that day.

COURT: You say that when the inspector gave you instruction you reported to the inspector and when the inspector gave you no instructions you reported to the clerk in charge of the faults log book. In this case the inspector gave you no instructions you must have reported to the clerk in charge of the log book.

A. I do not remember who gave me the order on that day.

COURT: You said on that day the inspector gave you no instructions?

A. In fact I do not remember who gave me instructions on that day whether it was the inspector or not.

BY DAVID: On that day I went there accompanied by an assistant. According to the log book it was Felicite. I know that because I see his name in the standby column in the log book. I see also in the standby column the name of Nagamootoo. Only my name is written as I am the workman and it is the name of the workman that the clerk writes down.

BY COURT: The clerk writes down only the name of the workman but not the name of the assistant. No it is not the practice because in another entry I see the name of Felicite also.

BY DAVID: I cannot say why the clerk wrote down my name only. According to the log book I reported to the clerk that the control fuse was oxidized. As I have said repaired it means that I have changed the blown fuse. I do not understand what REP in the entry means. I understand what is meant by control fuse oxidized. I do not understand what REP stands for. On that day the fuse was blown. When referring to the fuse carrier to the clerk I would say a yorkshire fuse. I would tell him that the Yorkshire fuse has oxidized. I told him that I replaced it by another. I did investigate to see what was the cause of oxidization. I do not remember if, apart from reporting the matter to the clerk, I talked things over to Mr Jean or an engineer, telling them what had happened to an installation we made on the 1st June. On the 1st of July I was not worried as to what had happened to an installation made on the 1st June. On the 6th July I was accompanied by James Louise. The driver Shipnot was also with us. On that day we first went to where the fault had occurred at Plaines Lauzun, that is, at the 3 industries

which had no electric supply. On that day I went there and at all 3 industries I was told that there was no electric supply. I did not examine their installations. I did not examine any of the nine yorkshire cutouts because all three industries had said that they had no electric supply. Then we went to Bata at Bel Village and returned in the company of a Bata employee. That Bata employee opened the store door for us. We went inside the room No.4 where the henley fuse box was. I do not remember how many persons there were in all in that room but I remember that there was myself, James Louise and the Bata employee. When I entered, the door of the henley fuse was normally closed. I had to use pliers to open it. When I had opened the door I examined the fuse carrier and noticed that one fuse had blown. I cannot say which of the 3 fuses blew. When I opened the fuse and removed the wire I could see the fuse wire. I cannot say whether the fuse wire had broken in the middle or at one end. I did not look of what colour that wire was at the time. To me what colour the wire has become has no importance at all because when it has blown we are to change it and place another fuse wire. My job is only to change the blown fuse but if there is an incident I have to report it.

COURT: What do you mean by an incident.

A. For example if the metal part has been burnt and things like that. By burnt I mean that the metallic part has become black that is oxidized.

BY DAVID: If the fuse wire has changed colour I have no report to make to that effect. On that day I removed only one fuse carrier from the henley box. I brought it outside and repaired it near my van. I do not remember what the Bata employee did when I went out. The tube was in good order. I do not remember if it had darkened. On that day the terminals were in very good order. Apart from replacing the fuse wire I sent my assistant to cut the supply of all three industries concerned. He did so by removing all the fuse carriers of the yorkshire cutouts, the whole wire of them. It was when I was repairing the fuse near my van that I sent Louise to remove the yorkshire fuse carriers. When I had ascertained that Louise had removed all wire I replaced my fuse carrier in that henley box. I took that precaution because the load of all three industries would come to bear on that fuse and therefore might cause a spark. It is a precaution that should be taken by any workman. I do not know whether

Mr Juste or Mr Jean take such precautions but I do. I do not remember who gave me instructions to do that job on that day. When I returned to the office I do not remember to whom I made my report. I do not remember what report I made to him. According to the entry I see that I reported that one fuse had blown on the cable box. This is all I told him. I do not remember if I told him that I had replaced the wire by a two wire No.18. I do not remember up to this day if somebody had asked me whether I had replaced the wire by a two No.18. These are instructions that have been given to us before. I do not remember whether I reported that I used a two No.18 wire though the blown fuse could be of one No.18 or two. I do not know if James Louise knew that the replacement was made using a two wire No.18 as he was on the Textile Industries building when I was doing so. I do not remember if I told him I had used a two-wire No.18 on his return. I was the only person who could give the information to the CEB because I was the workman who did it. I do not remember when after the 6th July that I made that repair I have given that information to the CEB. I remember that on the day I did the repair there was a fire at Bata Workshop. I do not remember if the Officials of the CEB had asked me particulars about the repair I did on that day. I do not remember up to now if an official from the CEB had asked me for details of what I did on that day. I do not remember if Mr Jean had asked me what work I had done on that day. I do not remember if Mr Juste or an inspector had asked me that same question. I do not remember if Mr Tranquille, Mr Dessi or Mr Labat or any high official of the CEB had asked me about it. I have not given a statement to the police in that connection. I do not remember before giving evidence in Court concerning the repair I had done on that day whether I have talked that thing to anyone else. I cannot say whether the entry "one fuse blown in cable box" of the 6th July is incomplete. On the morning of that day I did not enquire to see why those three industries had been deprived of their electric supply. On that day I did not measure the load of current coming through those wires. On that day after the work had been done I had no problem to close the door of the henley box. I closed it tight normally with the help of pliers. There are cables coming out from the top of the henley box. There are four holes and 4 cables coming through them. It was a round cable black in colour. There were tap saddles a short distance above the henley box on the 4 wires coming from it, they were also tied together with tape. There were 4 tap saddles. By tap saddles I mean bi-metallic

connectors. There was an insulated tape and it covered the connector completely. I do not remember in what position the connector was. It was installed in whatever position. I did not instal those connectors and I do not know in what position they were. The connectors were insulated with tape. It came from the henley fuse box, would cover the inside but I have not noticed how these wires came out at the top. The insulation is ensured by means of tape. The tube shown to me is a tube that contains grease to put on copper. The bi-metallic connector could be one foot above the henley box. The insulated tape is not made of plastic, it is a cloth material. All the wires from the henley box to the bi-metallic connectors were in good order. I held them to see whether they were hot. I held the four of them. I held them in the space between the henley fuse box and the bi-metallic connector. They were not hot. They were in good order. They were crispy. I did not have to change any wire. It was when I had done the repairs and that the electric supply had been cut that I held those cables before placing back the fuse carrier. It would not be true if somebody should say that on that day I cut a piece of that cable to replace it. I did not detach a piece of cable between the henley box and the bi-metallic connector. When I opened the box I examined the cables inside the henley box and they were in good order even the connection. I had only my tester, pliers and screw-driver on that day. I have replaced wires in the course of my work. To replace a wire that is cut we change it and place another one. When we make a connection between two wires we place them side by side, twist one extremity in one direction and the other in another direction and then we tape the connection. On that day if I had to change a cable there I would not be in a position to do it because I had no wire with me and would have had to go to the office to get it. In our van we have only fuse wires. We have also fuse carriers for the yorkshire cutout but not the complete yorkshire cutout. We have only short pieces of wire to use as fuse wire. Apart from that we have our ladder and the pole we use to remove the fuse carrier of the yorkshire cutout. On that day I held the cables before placing the fuse carrier because it is our principle to find out whether it has deteriorated or not. If it has deteriorated it would become hot and would crumble down. The best time to make such a check is not as soon as one comes there. If it was hot before it would remain some heat even after repairs had been done. I did not notice whether

there were boxes in that room on that day. I did not see anything on the floor where I was working. I did not notice anything.

Re-examined

BY MOOLLAN: Mr Nagamootoo mentioned in the entry of the 1st July was the driver. I cannot say whether only one person makes the entry in the log book or many.

BY COURT: I cannot say why in the log book only two industries are mentioned though three had no electric supply

No. 39

EVIDENCE OF WILLIAM ANTHONY HUGGET

HEIN calls and examines:

Mr William Anthony HUGGET (sworn) Technician Engineer, C.E.B.

Q. The 6th July 1972 was the day of the fire at Bata?

A. Yes.

Q. On that day sometime after one o'clock you received the news that there was a fire there?

A. Yes.

Q. What did you do?

A. I gave instructions to foreman Georgette to proceed immediately to switch off the high tension on the transformer supplying Bata and other industries at Plaine Lauzun.

Q. You proceeded to the spot yourself?

A. Soon afterwards I went to Bata. On my way there I was met by foreman Georgette who reported to me that he had switched off the HT fuse on the transformer.

Q. When you got there did you meet another C.E.B. employee?

A. There were a few employees but I was soon joined by Monty the foreman and I instructed him to remove all the HRC fuses on the 3 boxes on the transformer.

Q. Are these the HRC fuses? (EXHIBIT SHOWN TO WITNESS)

A. Yes.

Q. Were they removed by Monty in your presence?

A. Yes they were removed by Monty in my presence.

Q. Did Mr Monty give them to you?

A. Yes he gave them to me.

Q. Did you test them subsequently?

A. They were tested the next morning.

Q. How many of them?

A. There were 9 fuses.

COURT: Which fuse?

A. The HRC fuse - high rupturing capacity

COURT: Those are the fuses removed by Monty?

A. Yes.

COURT: What are the fuses removed by Georgette?

A. Georgette removed the HT fuses.

MR HEIN: What did Georgette do?

A. When he switched off the HT he isolated the transformer completely.

Q. What was the amperage of those 9 fuses?

A. When I tested them the next day I believe there were 160 amps.

Q. What was the result of your test?

A. Out of the nine fuses three were burnt.

Q. What did the nine fuses control. Was there one controlling one consumer or were there several controlling one consumer?

A. There were 3 cables from the transformer feeding the whole building, one cable for Bata in one trench and 2 cables in different trenches.

Q. There were how many fuses per consumer?

A. Three per cable.

COURT: You cannot say whether the three burnt were for which consumer?

A. No.

COURT: Monty could say so perhaps but you cannot say.

A. I can't say.

In the Supreme Court

Defendants' Evidence

No.39 William Anthony Hugget

Cross-examination

8th March 1978

Cross-examined

MR DAVID:CROSS-EXAMINES

Q. What time was it when you gave instructions to foreman Georgette?

A. It was just ten minutes before two in the afternoon.

Q. How far have you been then from Bata?

A. Bata is less than ¾ of a mile from the head office in Plaine Lauzun.

Q. How did foreman Georgette go by van?

A. Yes he immediately left by van.

Q. Did you make any entry at that time when you gave instructions?

A. No.

Q. When you say 10 to 2 did you at that time check the time it was or is it just an approximate recollection?

A. It was just after a call I had received from Poudriere.

Q. As soon as you received a call from Poudriere you immediately gave instructions?

A. Yes.

Q. Do you remember who contacted you from Poudriere Street?

A. I can't remember. It was a phone call from Poudriere.

MR DAVID: This is all for the moment unless after taking with my experts I have some further questions.

Defendants' Evidence

No.40 Regis Georgette

Examination

8th March 1978

No. 40

EVIDENCE OF REGIS GEORGETTE

MR HEIN calls and examines:

Mr REGIS GEORGETTE (sworn) Assistant Supervisor CEB, Beau Bassin

BY HEIN: I hear about the fire of Bata on the 6th July 1972. On that day some time after 1 p.m. following instructions from Mr Hugget, I took with me the pole the switch off the HT controlling the transformer. I got my instructions at Plaine Lauzun. I went by van.

BY COURT: I went from Plaine Lauzun to the site of the fire.

BY HEIN: It is a distance of less than a quarter of a mile. On my return after doing the job I met Mr Hugget who was going towards the site of the fire and I reported to him that I had done the needful. It was at about 10 to 2 when I received my instructions from Mr Hugget. I made no entry to that effect as it was an emergency that there was a fire and on my return I did not make any report. I do not remember the time at which I received my instructions.

NO CROSS EXAMINATION

No. 41

EVIDENCE OF RAFAEL MONTY

MR HEIN: CALLS AND EXAMINES

Rafael MONTY (sworn) foreman CEB of Ste Croix

MR HEIN: On the 6th July, 1972, while there was a fire at Bata I met Mr Hugget there in the afternoon. Mr Hugget gave me instructions to remove all the fuses on the transformer. I did so and handed over the fuses to Mr Hugget. There were nine in all. There were three fuses controlling Bata and six other fuses controlled two other circuits. The six others have nothing to do with Bata building.

BY COURT: I did not look up at the fuses.

NO CROSS EXAMINATION

No. 42

EVIDENCE OF ABDOOL SATAR NAHABOO

SIR RAYMOND HEIN: CALLS AND EXAMINES

Mr ABDOOL SATAR NAHABOO, Senior Clerk CEB, of Beau Bassin

Q. Mr Nahaboo, I am going to ask you to remember things which go back some six years ago, in 1972. What were your duties then in the CEB?

A. I was a Commercial Clerk.

Q. Do you belong to the electrical branch?

A. To the clerical branch.

Q. You have nothing to do with the technical, the electrical side?

A. No.

Q. Did it happen that in the course of your duties you made entries in the log book I am now showing you?

A. Yes, occasionally.

Q. Entries are made in this log book by any clerk or by a clerk who has that specific duty?

A. By any clerk.

Q. The clerk available at that particular time?

A. Yes, at that particular time. He answers telephone calls from our customers.

Q. I'll show you now the entry referring to the 25th May, which has been crossed out and initialled by Mr Jean.

A. Yes.

Q. On the 2nd line from the bottom there is in the margin "consumers name Diamond Company" is that your handwriting?

A. Yes it is.

Q. You say that you yourself wrote down on the right, opposite Diamond Company the words "part of installation faulty suppressed?".

A. Yes.

Q. Do you remember how you came to use those words "part of installation faulty"?

A. I really don't remember. That was 6 years ago.

Q. Someone must have told you?

A. I had instructions on that day but I can't know who gave me those instructions. I don't remember.

Q. You yourself wrote down the names of Jupin and Felicite?

A. Yes.

Q. I see that from the beginning of that line, from the name of the consumer (Diamond Company) everything is in your handwriting?

A. Yes. It is my handwriting.

Q. Should we understand, therefore, that you answered the phone call, that you write down the complaint from the consumer? What does that entry mean?

A. I may have answered the pnone call.

Q. You wrote down that Diamond Company had reported a fault?

A. Yes.

Q. I see lower down above that entry, on the second line, something in your handwriting?

A. Yes, it's my handwriting

Q. What did you do? What you have written down?

A. I have crossed out the word "Henley" and I have written down the word "outdoor".

Q. You have erased the word "Henley" and written down the word "outdoor"?

A. Yes.

Q. Was it you who erased the word "Henley"? It's the same ink and you wrote down "outdoor".?

A. Yes

Q. Outside the columns, I see the words "to claim only Rs 5 00". Is that your handwriting?

A Yes.

Q. Further on the right what can we see?

A. "Faults which occurred on the 25th May 1972 were repaired on the 26th May 1972"

Q. Can you try to recollect and tell us how those entries came to be made?

A. Those entries were made following two similar faults. A sum of Rs 5.00 had to be claimed from Diamond Company for its "indoor" and no claim was to be made to Ideal Printing because its "outdoor" had gone (had blown?).

Q. Please explain what you mean by those words "to claim Rs 5.00". In what circumstances do you claim it?

A. When the indoor fuse blows then the claim of Rs 5.00 is made.

Q. The consumer is asked to pay the Rs 5.00 when CEB workers are called upon to attend to a fault in the inside installation of that consumer?

COURT: No repairs are made and yet you claim Rs 5.00.

SIR RAYMOND: Try to remember why on that day you crossed out the word "Henley" and replaced it by the word "outdoor".

A. I do not remember.

Q. What is an Henley?

A. I don't know. I am not a technician. I know nothing about fuses or wires.

Q. I understood you to say that you knew the difference between "indoor" - when a claim is made - and "outdoor" when no claim is made?

A. For us in the clerical side it's technical jargon.

Q. For you "indoor" means claim and "outdoor" no claim?

A. Yes.

Q. What's an Henley?

A. I don't know.

Q. Don't know about a yorkshire either?

A. Yes, I don't know.

R E C E S S

Wednesday 8th March 1978
Bata Shoe Co. & Anor. v. C.E.B.

Cross-examination (Translation)

Cross-examined

AFTER RECESS

Mr David continues the cross-examination of:
Mr Abdool Satar Nahaboo (still under solemn affirmation)

Q. Mr Nahaboo, concerning the first entry which you made on the 25th May, 1972, you wrote down Diamond Co. Plaine Lauzun, two phases missing. You also put down the time, the number of the vehicles. Subsequently somebody back from Bata store gave you information?

A. From Diamond Co.

Q. Yes, from Diamond Co. The workman or employee can give you the information?

A. Yes.

Q. You said you don't remember who gave you those information. From the book can you say from whom you could have obtained those information? I'm talking about the 25th May.

A. I see the names of workmen Jupin and Felicite.

Q. Do we infer that one of those two workmen gave you the information? Or was it Mr Jean or Mr Juste?

A. I don't remember. All this took place 6 years ago.

Q. When you wrote down "part of installation faulty, suppressed" it must have come from Jupin or Felicite or from someone you don't remember now? Did you write the word "suppressed" at the same time also?

A. The same day, yes. It's the report made by the workman himself. The information is given by the workman and everything is noted in the book.

Q. You write down "time when workmen return". What do you mean by "everything" consumers' return?

A. I get a telephone message and I make an entry.

Q. Up to "time workmen return"?

A. Up to "time fault reported".

Q. Did you write "when workmen go out"?

A. Yes, I did write that.

Q. Did you write the word "suppressed" at the same time you wrote "part of installation faulty"?

A. This is what was reported to me, perhaps to me, It is my handwriting.

Q. If you have written "part of installation faulty suppressed", it necessarily means that you couldn't have been told that 2 fuses had blown, that repairs had been made and that everything was now in order? If such was the report made to you, you wouldn't have made the entry you have in fact made?

A. I don't remember.

COURT: Would you have written down something different from what you were told?

A. This is what was reported to me.

Q. If you were told something different, you would have written something different?

A. Yes.

MR DAVID: Another previous entry concerning Ideal Printing, this is not your handwriting, refers to the same workmen Jupin and Felicite. Normally, therefore, they were back already when you made the entry at 1500 hours relating to them, Jupin and Felicite? The entries made at 12.40 hours in the first line, Ideal Printing, would already have been made?

A. From the book I see erasures.

COURT: In normal circumstances, when you made your entry the entry previous to it should

already have been made?

A. I don't remember.

Q. Can it happen that you make an entry at 1500 hours when the entry for 11.00 hours has not been made?

A. It should have been made.

MR DAVID: About the entry of the 26th May, you said you know nothing about a henley fuse, about technical matters, could you tell the Court one again why you crossed out the word "henley" and replaced it by the word "outdoor"?

A. From instructions received, as there were only one customer from whom to claim Rs 5.- it is clear that it must have been "outdoor".

Q. You did not do it by yourself but you received instructions from someone. Could you tell the Court who gave you those instructions?

A. It's hard for me to say, after six years, who gave me those instructions.

Q. Someone from the office?

A. Of course.

Q. You were then the Commercial Clerk, did you have the duty, as Commercial Clerk, to change the word "henley" into "outdoor"?

A. I don't know the technical side.

Q. You acted on instructions received?

A. As was the case with the other consumer, faulty suppressed. The claim of RS 5.- had to be made.

Q. You certainly acted on instructions from another CEB employee, didn't you, Mr Nahaboo? You did it not by yourself but from instructions you got from someone else?

A. I had instructions from someone but I don't remember who.

COURT: Does "Henley fuse" mean anything to you?

A. I don't know the term.

Q. How is it that you wrote "outdoor"? Even for your own information, you must have acted on instructions? Someone must have told you what it was?

A. I had instructions to claim from one customer only.

MR DAVID: Did you or did you not receive instructions to make those alterations? Did you do it yourself although you did not know anything about a henley? Or because someone told you to do so?

A. I did not do it by myself.

Q. And you do not remember who told you to make those alterations?

A. I can't remember.

Q. Can you tell the Court if you remember the time lapse between the moment you wrote the word "henley" and the moment you wrote the word "outdoor"? Was it an hour, a day, a week, a month?

SIR RAYMOND: He did not write the word "henley", he crossed it out.

MR DAVID: According to the entries, the word "henley" would have been written on the 26th May around 1100 hours, do you agree? Can you tell the Court, if you remember, when you made the alteration?

A. The superintendent checks the book morning and evening. The entry could be made two minutes after the workman returned.

Q. The alteration?

A. I crossed out the word "henley" and wrote "outdoor"

Q. When did you do that?

A. On the 26th.

Re-examined

Re-examined by Sir Raymond

Q. I see at the extreme right of the page the words "fault which occurred on the 25th May repaired on the 26th May". Was the entry bearing date 25th May and which says "part of installation faulty suppressed" made on the 25th or the 26th? The repairs were only done on the 26th. Was the entry made on the 25th in anticipation of what was to be done on the 26th?

A. No.

Q. Was the entry of the 25th, opposite Diamond, made on the 25th or at least on the 26th? You did not know on the 25th that it was going to be suppressed on the 26th?

A. No.

Q. Therefore the entry could not have been made on the 25th?

A. I can't remember.

Q. Could you note down today that you have suppressed the installation tomorrow?

A. No.

Q. In the middle of the page there's a column, see the letters BF at the date of the 26th opposite Ideal Printing and Diamond?

A. Brought forward.

Q. Brought forward from what?

A. From previous entry?

Q. This means that the repairs of the 25th were made on the 26th and it's only on the 26th that you were informed and not on the 25th?

A. Yes.

No. 43

EVIDENCE OF WILLIAM ANTHONY HUGGET (continued)

Mr David moves to cross-examine Mr Hugget (still under oath)

Motion granted.

Q. You have mentioned that the cables that left the transformer for the three lots of consumers, one cable for Bata and two others for other consumers?

A. That is correct.

Q. Could you tell the court whether the sheathes of those 3 cables were bonded together or not?

A. I cannot give a definite answer.

Q. You cannot say whether the sheathes of the cables leaving the transformer were bonded together or not?

A. No.

Q. Who would tell us?

A. I do not know, the cables were laid in 1968.

Q. The persons involved in the laying of those cables would be able to tell us?

A. That is correct.

No. 44

EVIDENCE OF AHMED MOSAHEB

Mr Moollan calls and examines: Ahmed Mosaheb (SAM)

Q. Where and for whom were you working in 1972?

A. In 1972 I was working at Imprimerie Ideale for Adam Razack.

Q. How long before had you been working for Mr Razack?

A. I have been working for Mr Razack during six years before 1972.

Q. How long before 1972 had you been working for Mr Razack?

A. I worked for Mr Razack for more than one year before 1972.

Q. Was Mr Razack the owner of a printing press somewhere other than at Plaine Lauzun?

A. The printing of Mr Razack was being transferred to P.Lauzun.

Q. Where was it found before the transfer?

A. It was near the quay at Port-Louis.

Q. Mr Razack is also the owner of Quay Store?

A. Mr Razack is also proprietor of Quay Store.

Q. Which is found in the yard near the Arabian Docks?

A. This is situated near the Arabian Docks; the printing press was in the yard behind that store.

Q. Were all the machines transferred at one go from behind Quay Store to Plaine Lauzun? How was the transfer done?

A. The machines were being transferred one at a time.

Q. When the machines were being installed at Plaine Lauzun, was the printing press near Quay Store functioning or had it stopped functioning?

A. When the machines were being installed at Plaine Lauzun the printing press near quay store was still working.

Q. Do you remember the fire which broke out in Bata's warehouse at Plaine Lauzun in 1972?

A. I remember in 1972 there was a fire at Plaine Lauzun where Bata's godown was situated.

Q. Where were you working on that day?

A. On that day I was working at Imprimerie Ideale at P.Lauzun.

Q. On that day, had the printing press at Plaine Lauzun already been installed?

A. I do not know exactly, but about 4 or 5 printing presses had been installed at Plaine Lauzun.

Q. But you can say exactly whether all the machines had been installed at Plaine Lauzun or whether there were some machines still at Quay Store:

A. There were still machines near the Quay Store.

Q. Do you remember if there was a big 10 HP press still at Quay Store?

A. At Quay Store there was a big printing press of 10 HP.

Q. Was that press transferred to Plaine Lauzun?

A. That press had not been sent to Plaine Lauzun.

Q. During all the time you worked for Mr Razack, do you know if that printing press was ever sent to Plaine Lauzun?

A. While I was working with Mr Razack that printing press had never been sent to Plaine Lauzun.

Q. If at the time you were working there a machine known as "the guillotine" was sent to Plaine Lauzun, you would know, wouldn't you, since you were at Quay Store?

A. I do not remember if at the time the machines used to cut sheets of paper had been transferred to Plaine Lauzun.

Q. What was your job at the printing?

A. I worked as pressman.

Q. The press on which you worked was it a one-phase or a three-phase motor?

A. The printing press on which I worked has three phases.

Q. On the day of the fire were you working on that press at Ideal Printing?

A. On the day of the fire I was working on that press.

Q. How did you know that a fire had broken out?

A. I came to know that fire had started when during my work I heard people shouting fire.

Q. What you were doing when you heard shouts?

A. When I heard the shouts I went on working.

Q. Was your motor on or off at that time?

A. The motor was on.

Q. What happened next?

A After a certain time smoke came.

Q. What do you mean by "after a certain time"?

A. It could be after 4 or 5 minutes.

Q. After those 4 or 5 minutes, people were shouting fire and smoke was coming in, was the motor running.

A. During that period the motor was still on.

Q. Yes, what happened next.

A. Later on the electricity supply stopped and I went out.

Q. How did you know that the supply was cut?

A. When the press stopped working I knew that the electric supply was cut off.

Cross-examined

XED by Mr David:

Q. Was the work going on at Mr Razack's press at Quay Store when the transfer was being made?

A. During the time the transfer was on, some workers were still working at the press.

Q. How many workmen did Mr Razack employ?

A. I do not know how many persons were employed in the printing press.

Q. Can you say whether half the number of workmen were working at Plaine Lauzun and the other half at Quay Store on the day of the fire?

A. I cannot remember at the time of the fire what proportion of the employees were working at Plaine Lauzun.

Q. Where was Mr Razack spending most of his time then?

A. During that time Mr Razack was spending his time at Imprimerie Ideale at Plaine Lauzun.

Q. Mr Razack was himself in charge?

A. He was in charge.

Q. He was in charge at Plaine Lauzun, who was in charge at Quay Store?

A. At Quay Store the father of Mr Razack was in charge.

Q. Mr Razack's father was in charge at Quay Store?

A. He was in charge of both.

Q. At some time or other, did you have a welder working at the press at Plaine Lauzun?

A. At Plaine Lauzun at no time has there been a welder at the printing press.

Q. What were the working hours at Plaine Lauzun?

A. At Plaine Lauzun we started work at 7.30 and ended at 5.

Q. Lunch time?

A. We had lunch from noon to 12.30.

Q. There were 2 other industries in the area; one was Southern Cross, engaged in diamond cutting, do you remember?

A. I do not remember Southern Cross.

Q. Another was a textile industry, managed by Mr Ahchuen?

A. I remember Textile Industries.

Q. Do you know their working hours?

A. I do not know what was the time of work of the people there or their lunch time.

Q. Do you know why the transfer was made? Did Mr Razack choose to do so because of larger working space? Or was there a Court order?

A. I cannot say why Mr Razack decided to transfer.

Q. Some time before the fire on the 6th July, say a month, six weeks or 2 months before the fire, were there electricity cuts at Ideal Printing?

A. Before the fire there used to be electric cuts there.

Q. How often did those cuts occur?

A. The cut would last one hour, the supply was restored after telephoning the CEB.

Q. Do you remember how often there were cuts in June?

A. I do not remember how many time in the month of June 1972 there have been cuts.

Q. If you were asked if the electricity cuts were frequent or rare during the weeks preceding the fire, what would you say?

A. There used to be cuts, but I cannot say how many times before the fire broke out.

Q. Who did the repairs for those cuts?

A. After those cuts the CEB people would repair.

Q. They would repair but what did they actually do?

A. They come to repair, amongst others, fuses.

Q. They came and replaced the fuses, what else?

A. They change the fuses and then I go back to work.

Q. Could you remember how many times the CEB came to replace the fuses?

A. I do not remember how many times the CEB came to change the fuse.

Q. Did anybody have anything to do with the electrical installation of Ideal Printing, apart from the CEB people?

A. Apart from the CEB sometimes when the fuse was blown in our printing press the workmen there would repair it.

Q. The indoor or the outdoor fuses?

A. This applies to the indoor fuses.

Q. Apart from repairing the fuses, have you ever changed anything, replaced any wire or done any other repairs?

A. Apart from that they had not made any other repair nor change a piece of wire.

Q. You say that the workers of the press repaired the indoor fuses when those blew, apart from that did they ever do the indoor installations, change any wires?

A. No.

Q. Do you know what's a yorkshire cut out, the fuse placed outside the press building?

A. I do not know what a yorkshire cut out is.

Q. And do you know what this is? (Exhibit 5).

A. I do not know exhibit 5.

Q. You don't know whether this is installed or not outside Ideal Printing and when it was installed?

A. I do not know when these were installed at Imprimerie Ideale.

Q. You were busy working when you heard shouts of fire; you resumed work on that day at 12.30. How long after 12.30 did you hear those shouts?

A. Our lunch time is from noon to 12.30, I do not remember how long after resuming work at 12.30 I heard persons shouted fire.

Q. Do you know when the supply was cut?

A. I do not know at what time the electric supply was stopped.

Q. You said you saw smoke coming in. Where did the smoke come from?

A. I did not know at first from where the smoke came; it was when the supply was interrupted and I went out that I came to know that there was a fire at Bata.

Q. Where did the smoke come from? 10

A. The smoke came through the window.

Q. You actually saw the smoke, afterwards how did it go out?

A. Later I did not see from where the smoke came.

Q. When you heard shouts of fire, your mates went out to see, what did you say?

A. When I heard the shouts of fire I went on working as well as all my colleagues. Nobody went out to see. 20

Q. You said you were working on a three phase printing press. Can you explain what is a three phase press?

A. I do not know what is meant by three phase, but I know that the motor I worked with had three because there is a board on which three lights light when we work and if one light goes out the motor would go slowly.

Q. At that time work was going on normally? 30

A. The three blew out.

Q. Before the press stopped when the supply was cut, the three phases were working normally?

A. Before the cut the three phases were going on normally.

Re-examined

Re-examined by Mr Moollan

Q. There were mechanics working there?

A. There were mechanics there. 40

Q. You also said the machines were transferred one at a time. When a machine arrived, what had to be done with it?

A. It had to be unloaded first and then the electrical installation was made. When the machines arrived then installation had to be made.

Q. You said that while you were working the smoke came in, you don't know where it came from and it came in through the window, when the engines stopped you went out. Did you have an idea then where the smoke came from?

A. It was when I went to see that I knew that the smoke came from Bata.

COURT: Those people who were shouting fire, how far from your workshop were they?

A. The distance would be from where I stand to just outside the court room.

No. 45

EVIDENCE OF RAYMOND AH CHUEN

Mr Hein calls and examines: Mr. Raymond Ah Chuen (sworn)

Q. You are the Manager of Textiles Industries?

A. Yes.

Q. You do remember that there was a fire at Bata on the 6th July 1972?

A. Yes.

Q. Were you on that day at Textile Industries office at Plaine Lauzun?

A. I was away at that time.

Q. Please look at those 2 documents (Docs. AU and AV). Did you sign them?

A. Yes. Both of them.

Q. It's an application made to CEB for an electric supply at Textile Industries at Plaine Lauzun. What's the date of the first application?

A. 25th May 1972.

Q. We were told here in Court that Textile was given a supply on the 1st June 1972?

A. Yes.

Q. After the fire one of the engineers of Bata Insurers came to inspect Textile Industries and saw a number of machines installed; he said that, at that time, there were 126 machines installed and 40 were in operation. When did the installation of the machines begin? Was it when you obtained a supply or after?

A. At the time we obtained the electric supply.

Q. Who was responsible for the indoor electric installation of Textiles?

A. An electrician from Hong Kong.

Q. The workers were also from Hong Kong or were they Mauritians?

A. They were all Mauritians.

Q. They did the installations for the lighting and for the machines, too? Those machines are sewing machines, cutting machines and what else?

A. Ironing machines too.

Q. All those machines are electrically powered aren't they?

A. Yes.

Q. The man from Hong Kong was in charge of the lightings and of the machines too?

A. Yes.

Q. You also made an application for an additional load. When was the application made?

A. On the 28th June 1972.

Q. When did the man from Hong Kong complete the electrical installations of Textiles? Do you have any record of that? When did he arrive in Mauritius and when did he leave?

A. He left around August or September 1972.

Q. He was engaged all the time until he left in putting up the electrical installations?

A. Yes.

Q. The Bata engineer says that around the 17th or 18th July, 1972, i.e some 12 days after the fire, there were 126 machines installed and 40 were operating; on the day of the fire were the same number of machines operating? Or less or more?

A. There should have been less necessarily.

Q. He said some 40 machines were in use for the training of the workers?

A. Yes.

Q. When did the company start its production?

A. Production started around August 1972.

Q. The raw materials textiles were imported or bought on the local market?

A. For production purposes they were imported.

Q. When did you receive the first batch of raw materials?

A. After the fire. I don't know the precise date.

Q. Until then, where did you buy the raw materials for the training of the female workers?

A. He had to buy them locally because our textiles had not arrived yet.

Q. When did you ship or export the first batch of finished products?

A. The first batch of finished goods were exported around December 1972.

Q. From the start, the first day you got the electric supply in June, to the time of the fire, female workers were being trained and the electrical installations were being gradually put up?

A. Yes, gradually.

Q. When was your second application made?

A. On the 28th June.

Q. The meter in your factory was changed before that date, did you approach the CEB for that purpose?

A. I contacted Mr Jean about it at Plaine Lauzun.

Q. What did you tell him?

A. I told him that we were concerned about the slow pace at which lighting installations were proceeding. I told him that we would require a somewhat heavier load and that I feared that our operations would be somewhat delayed.

Q. What did they do?

A. When I expressed my concern, he said I should apply for the additiinal load and that meanwhile the meter would be changed to accommodate the additional load which would be approved.

Q. Why did you ask for an additiona load?

A. Because we were expecting other machines.

Q. Had those machines arrived when you applied on the 28th June?

A. No.

Q. Was your second application for an additional load (Doc AV) approved rightaway?

A. No. Some few days after the fire.

Q. Do you know where the connection was made for this additional load? A. I have no idea

Cross-examined

XED by Mr David:

Q. When was Textile Industries set up at Plaine Lauzun, Mr Ah Chuen?

A. Early May or June 1972.

Q. When did you recruit staff for training? We know that the electric supply was provided on the 1st June?

A. Yes.

Q. When did you recruit your staff?

A. When the factory opened its doors, the 1st June or the first week of June.

Q. Can you tell the Court how many girls you recruited? How many do you have at the moment?

A. 900.

Q. Compared to the starting figures, have you doubled, trebled your staff?

A. We have trebled.

Q. Meaning that in June 72, you started with some 300 girls on your staff?

A. That's not possible. We must have had some 40 or 50 girls on training.

Q. How long did you take to train each group of girls?

A. 2 months, 5 weeks for each group.

Q. In June you had some 40 female staff?

A. Yes.

Q. Is this why you had 40 machines operating at that time?

A. Around that.

Q. What were there working hours during their training?

A. From 8 to 5.

Q. And the lunch hour?

A. Noon to one or 12.45.

Q. Those female workers operated the machines all day long?

A. Yes. The whole day.

Q. Those machines worked on how many phases?

A. I am sorry, I can't say.

Q. Do you remember with what load you started?

A. 20 KW.

Q. Whom did you contact for this first application? Mr Jean or someone else? You signed the application form, do you remember if a site meeting was held?

A. Yes.

Q. Mr Jean came to contact you?

A. Yes.

Q. Was the CEB reluctant to grant you the 20 KW?

A. I don't remember.

Q. You were granted the 20 KW. Did you feel you could use the whole load of 20 KW if necessary? Did you have any conversation about this?

A. I had told Mr Jean that I would not be consuming the whole load.

Q. How did you come to tell him that?

A. Because girls were recruited gradually for training purposes and training did not require that load of electric supply.

Q. Was the CEB reluctant to approve your application for 20 KW?

A. I don't remember.

Q. Did you have to give an undertaking to the CEB that you would not use the 20 KW?

A. No.

Q. Did you feel free to use the entire load you had applied for?

A. I suppose so.

Q. Although you had told Mr Jean that you would not be consuming the entire load, yet you felt you were free to use it all if necessary?

A. Yes.

Q. Did you undertake on your word of honour, "placed on your honour", to use, say, 10 KW although you had been granted 20 KW?

COURT: Did you pledge your word to use not more than 10 KW?

A. I don't remember.

MR DAVID: You are a well-known industrialist and businessman Mr Ah Chuen. You are not any Tom, Dick or Harry. I'll ask you again the question, knowing full well that you can be trusted to answer truthfully: there's my question: was it not agreed between the CEB and yourself that for some time you would not use more than 10 KW? Please answer my question.

A. I don't understand the question.

COURT: When you applied for a supply, there were some difficulties a transformer was being built. In the meantime, certain adjustments had to be made. Wasn't the CEB reluctant to grant your application and weren't you asked to use only part of the load which you were being granted because of the difficulties which might crop up?

A. I don't know about those difficulties.

Q. Nobody asked you to give your word of honour that you would be using only 10 KW?

A. No.

Q. You were the one who held talks with Mr Jean?

A. Yes.

Q. You were the one who took the undertakings?

A. Yes.

Q. Around the 1st of June, were there any breakdowns, any supply cuts?

A. I cannot say. I wasn't in the factory all the time.

Q. Were you aware that CEB was putting up another transformer to supply electricity in the area?

A. I could see the work going on and I knew it had something to do with the supply.

Q. You must have been concerned then, that's quite normal, you are a industrialist and you wished to start your activities. You had very good grounds to set your business afoot. Without any delay?

A. Yes.

Q. You wished to obtain the maximum load as early as possible?

A. Yes.

Q. Did you, therefore, press the CEB on?

A. At one time, yes.

Q. As we know, you did ask, around the 28th June for 18.6 KW?

A. Yes.

Q. You were anxious to have it as early as possible.

A. Yes, as early as possible.

Q. It was you who suggested that a meter be installed? Or was it Mr Jean or somebody else?

A. It was Mr Jean.

Q. So on the 1st June your installations are set up. Could we say that from that time onwards your industry gradually develops?

A. Gradually, yes.

Q. Now, was all your female staff being trained to use all the machines the sewing machines? Or were the girls divided into groups, each for a particular machine?

A. Into groups.

Q. What has to be done before the cutting operation? How many layers of material are cut at one time?

A. Some 100 to 150 layers of material are cut. They are placed on the cutting table and the machine cuts along the pattern. The material has to be arranged accordingly.

Q. Cutting cannot be done from morning to evening?

A. That has never happened.

Q. The same applies to sewing. Does the same worker who cuts shirts also do the collars?

A. Different groups do different operations. A group would do the collars, another the button holes, another the bodies. There are breaks between each operation.

Q. On the 6th July, at the time of the fire, had you been granted the full load of 20 KW you had applied for?

A. No. Only part of it.

Q. On that 6th July, were all your equipment, listed in the first application of the 25th May 1972, installed?

A. Only part of it.

No. 46

EVIDENCE OF ADAM RAZACK

Mr Moollan calls examines Mr Adam Razack (SAM)

Q. Mr Razack, you are the son of Mr Hakim Razack, the owner of Quay Store and of the printing press situated at the back of that store?

A. Yes.

Q. Since when does your father run that press?

A. About 1957.

Q. In 1972 your father decided to move to Plaine Lauzun?

A. Yes.

Q. To a DBM building which was rented?

A. Yes.

Q. And you took charge of that new section?

A. Yes.

Q. How was the transfer to Plaine Lauzun effected? Was all the equipment the machines, transferred all at one go or were they moved gradually from Quay Store to Plaine Lauzun?

A. Gradually.

Q. When the transfer was taking place, were the machines at Quay Store still operating?

A. Yes.

Q. Did work start immediately on a machine once it was moved to Plaine Lauzun?

A. The machine was first installed and made to run and then another machine would be transferred.

Q. Did you have for your requirements at Plaine Lauzun, to apply for a supply? Is this the application?

A. Yes.

Q. I see that there are triple phases machines?

A. Yes.

Q. The first motor is a 10½ HP, what is it? What does it do?

A. It runs the printing press.

Q. When you applied for the supply, where were the machines listed in your application?

A. At Quay store.

Q. When was that big 10 HP press transferred to Plaine Aluzun?

A. It has never been transferred to Plaine Lauzun.

Q. Why?

A. It was sold right on the spot.

Q. You remember that a fire broke out in Bata's warehouse in 1972?

A. Yes.

Q. Where were you then?

A. I was in my workshop in Port-Louis, and not at Plaine Lauzun.

Q. Had all the machines listed on the

application form been transferred to Plaine Lauzun, then?

A. No.

Q. The big motor has never been transferred, we know that. But what about the others? How many had been installed?

A. I can't say exactly. I believe some 2 or 3 were still at Quay Store.

Q. So that 4 or 5 were installed at Plaine Lauzun.

A. That's quite possible.

Q. The 7 HP motors were used to run what type of machines?

A. Most of them for the "halves". There were 2 for the guillotine.

Q. I see 7 HP, 5 HP, 2½ HP motors. Guillotines run on motors of how many HPs?

A. 5 HP motors. There were 2 guillotines.

Q. Do you remember how many guillotines were in use when the fire broke out?

A. I don't remember.

Q. Were both guillotines operating or none of them?

A. I think one was operating.

Q. You were working both at Plaine Lauzun and at Port-Louis when the fire broke out, was printing still being done at Plaine Lauzun?

A. Yes.

Q. Was paper cutting done both in Port Louis and at Plaine Lauzun?

A. Yes, at both places.

Cross-examined

Cross-examination (Translation)

XED by Mr David

Q. Did you spend most of your time at Plaine Lauzun?

A. Yes.

Q. Do you remember when you had been established there?

A. Early 1972.

Q. Can you tell the Court if, say, from the 25th May to the day of the fire, you had problems with the electric supply?

A. Yes. We often had problems.

Q. How often?

A. Two or three times a week.

Q. Sometimes perhaps more often?

A. I can't say.

Q. When you had problems, what did you do?

A. We rang up CEB.

Q. The CEB workers came to do the repairs. Where?

A. We took our supply from Bata store. They came to do the repairs there.

Q. Didn't you, at a certain time, fix some sort of fuses, or cut outs outside your building?

A. I don't remember.

Q. You say that CEB workers, when they were requested to attend, went to do the repairs in Bata store?

A. Yes.

Q. Didn't they ever call at your workshop?

A. They came to ask about the nature of the problems and they went directly to Bata.

Q. After they had gone to Bata did you get back your supply?

A. Yes.

Q. Have you ever used a welder?

A. I don't remember.

Q. Haven't you ever borrowed a welder at Plaine Lauzun?

A. It's quite possible.

Q. Was it before or after the fire?

A. I can't say.

Q. How long did you keep that welder? You wanted a welder for what purpose? To carry out installations?

A. For installations inside the building, for indoor installations.

Q. How long did you keep that welder?

A. I don't remember.

Q. You are the man in charge of the business, can't you say from whom you borrowed that welder?

A. It belonged to the shop at Quay store.

Q. It was moved from Quay store to Plaine Lauzun and you can't say how long you kept it?

A. No.

Q. How many printing machines did you have at Plaine Lauzun on the 6th July?

A. About five.

Q. How many machines do you own?

A. Nine.

Q. When you had sold the big 10 HP printing machine, didn't you replace it?

A. No.

Q. You had nine printing machines, including the 10 HP, the biggest one, you sell it and you don't replace it? You were left with 8 machines?

A. Yes.

Q. When you moved from Quay Street to Plaine Lauzun, your business was in full expansion?

A. Yes.

Q. And you do away with your biggest printing machine?

A. It was an old machine; only its engine was big.

Q. You were happy with the 8 others?

A. We had placed orders for more.

Q. How many do you now have?

A. 15.

Q. Since when?

A. Since 1975, 1976.

Q. Some foreigners came to inspect your premises after the fire. Did Mr Cole and Mr Davidson call on you?

A. I don't remember.

Q. Didn't anyone from Bata inspect your premises after the fire? Don't you remember any foreigners coming to your workshop?

A. It's possible but I can't remember.

Q. Can you remember how much electricity you consumed for the months of July and August 1972?

A. No.

Re-examined

Re-examined by Mr Moollan

Q. To whom did you sell the 10 HP motor?

A. To a school journal.

Q. Since when did you place orders for a new

printing press?

A. In 1973.

Q. In 1972, did you spend your whole time at Plaine Lauzun?

A. I spent my time between Quay Store and Plaine Lauzun.

No. 47

EVIDENCE OF ROGER CHEUNG CHOI

Mr Hein calls and examines Roger Cheung Choi (sworn) Accountant

Q. Since when are you working with Textile Industries?

A. Since June 1972.

Q. Textile was set up in the DBM building in June 1972?

A. Yes.

Q. Where was your office located then? On the ground floor or upstairs?

A. On the ground floor.

Q. In relation to the road, was it near a window or inside the building?

A. Near the road, near a window.

Q. Was the building separate from that of Bata?

A. Yes.

Q. Where were the machines the sewing machines the ironing machines and the cutting machines? On the ground floor?

A. The cutting machines were on ground floor and the sewing machines were upstairs.

Q. Are they noisy or quiet when they are functioning?

A. They are noisy.

Q. Can you hear the noise of the machines from your office?

A. The noise of the motors can be heard.

Q. You remember the day of the fire?

A. Yes.

Q. What were the working hours at that time?

A. 8 to 5.

Q. And the lunch hour?

A. From noon to 12.45.

Q. Where were you on the day of the fire? In your office or in town, in Port-Louis?

A. I was in my office.

Q. Was your office lighted or was daylight from the window enough for you?

A. My office was lighted.

Q. Was it lighted on that day?

A. Yes.

Q. You came to know, at a certain moment, that there was a fire?

A. Yes.

Q. How did you know?

A. I heard shouts of fire from outside.

Q. When you heard those shouts, was your office lighted?

A. Yes.

Q. Just before you heard shouts of fire, could you hear the noise of the engines?

A. Everything was normal; the noise of the engines could be heard.

Q. What did you do when you heard the shouts?

A. I went outside.

Q. What did you see?

A. Snoke coming out of the Bata building.

Q. Did you stay outside for long? Or did you just have a quick look and then go back to your office?

A. I had a quick look and went back to my office

Q. When you came back into your office, were the lights on or off?

A. They were still on.

Q. Did they go off at one time?

A. Yes.

Q. You said that when you went back to your office the lights were still on what about the machines? Were they running or had they stopped?

A. I don't remember.

Q. You remember that the lights were on in your office but you don't remember if the machines were running or not. When you heard shouts of fire, you went out of your office and the machines were running?

A. Yes.

At this stage the case is adjourned to tomorrow Thursday 9th March, 1978, for continuation

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On Thursday 9 March 1978 at 10.30 a.m.

9th March 1978

Before Honourable M. Rault, Acting Chief Justice
P. de Ravel, Judge

Mr Raymond Hein, Q.C. examined R.Chung Chun Choy

Mr Raymond Hein, Q.C.: One last question my Lords

.....

Q. Southern Cross Diamond Co. was operating in 1972?

A. Yes.

20

Q. In which building?

A. In the same block of buildings as the Textile Industry.

Q. Is that company still in activity?

A. No, it closed down in 1974 or 1975.

That is all.

Cross-examination (Translation)

Cross-examined

Xd by Mr Marc David Q.C.

Q. You worked with Textile for the whole month of June. Can you say whether during that month and up to the time of the fire on the 6th July, there were power cuts there at Textile?

30

A. Actually, I joined Textile on the 21st June.

Q. Well, then, from 21st June to the 6th July, were there any power cuts at Textile?

A. Yes, in the projection room but in the offices almost none.

Q. In your office, where there are lights you cannot tell the Court if there were cuts there? This is what you mean?

COURT: He said that there were rather frequent cuts in the projection room but not in the office.

Q. There were no cuts in the office?

A. No.

Q. Is the projection room upstairs or on the same (level)?

A. Upstairs but part of it is next door.

Q. Do you know how often there were power cuts?

A. On rather many occasions but I cannot say how many times.

Q. Any idea, say 6, 10 or 20 times during that period?

A. On rather numerous occasions.

Q. When there were cuts, who made the repairs?

A. Our own electricians.

Q. CEB workers had nothing to do with those repairs?

A. As far as I remember, no, because those cuts were due to short circuits.

Q. Do you mean to say short circuits on the consumers' side? Your own electricians took charge of that and as far as you know CEB workers never intervened?

A. No.

Q. At what time did you resume work on the day of the fire?

A. Around 1 p.m.

Q. How long after did you hear shouts of "fire, fire"?

A. Some half an hour later.

Q. Did you check the time on your watch?

A. No.

Q. Then you went outside and stayed outside, for how long?

A. One or two minutes.

Q. You went back to your office and how long after the lights went off?

A. Some 5 or 10 minutes after I had entered my office.

MR DAVID QC: That's all.

COURT: You deponed at the Judicial Enquiry?

A. No.

COURT: You gave a statement to the police?

A. No.

COURT: When for the first time, did you give a statement to anybody about this matter?

A. In December, 1977.

Mr MARC DAVID Q.C.

My Lords, I understand that Mr Turner will depone but before that I should like to ask for the consumption of the electricity for the months of July and August 1972 in respect of Imprimerie Ideale?

MR MOOLLAN Q.C.:

In this respect for those figures we have requested that information be supplied, it appears that the card for that period right up to June 1974 is not available and cannot be traced. We have also contacted the manager of the Ideale whether there is any information that could be obtained but unfortunately on his side there was a fire last year and both Textile Industry and Ideale Printing have not yet been able to find those documents.

No. 48

EVIDENCE OF HENRY WALTER TURNER (continued)

Mr Turner is recalled by consent of both parties

Xed by Mr David Q.C.

Q. Mr Turner after you had given evidence on the last occasion did you receive a telex from Mr Davidson?

A. I do.

Q. Asking you for certain information which involved certain calculations being made by you?

A. Yes my Lord the calculations required were rather perplexing in the telex. In that I was asked to calculate the resistance of cable sheaths and armoury in parallel which is the normal return path for the earthing system of an electrical installation of this type and the same telex requested further information on earth leakage conduction of 4 amperes referring to the same installation. I answered to the best of my ability at that distance

these two questions but could not resolve the problem until I came to Mauritius and saw the diagram with which Mr Davidson had been confronted in Court.

Q. Is this the document? Please show this to Mr Turner?

A. Yes this is the document concerned.

(Document AJ produced)

Q. Mr Turner when you arrived in Mauritius you then saw this diagram and did anything strike you?

A. I was amazed that the left sheath and armouring was not bonded to the neutral earth at the sub station and I would still like to know whether this is the case or not. Whether this is a true representation of the CEB sub station connections.

Mr David Q.C.: My Lords, before Mr Turner would proceed so as to avoid losing time, would my friend

Mr Moollan Q.C.: We will be extremely happy if there is a joint test by all the experts and

Mr David Q.C.: At this stage with confirmation by my friends that this diagram represents the situation as at 1972 and as seen by Mr Woodcock.

Mr Moollan Q.C.: So far as 1972 it is our instruction that it is the same.

Mr David Q.C.: We are perfectly satisfied that it was the same.

Court: Mr Turner said that he was amazed by the information could he explain why he was amazed?

A. I would explain my Lord. This diagram shows no means of adequate earthing obvious Henley fuse box. In my opinion this is an unsafe arrangement because of two reasons.

First of all the resistance to earth which has been given as a measurement of 52 ohms is the only connection to the earth of this metal box. Once the connection to earth has been made the resistance of the globe on which we all live is so low that you are connected electrically to any other earth in the system through its own earth resistance. And that would mean that the load sheath and armouring would be connected to the earth on the transformer by resistance of 9 ohms making a total of 61 ohms in the circle.

Now if we consider some electrical fault which produces the connection between any of

the live conductors and this case the case of the Henley fuse box then that Henley fuse box would become live to the touch and there would be a danger of electrocution and also a danger of electrocution on any other unit connected to the same left sheath and armouring because the potential, the voltage of all those pieces of metal work would rise to 230 ohms and the current of approximately 4 amps, a little less than 4 amps would flow to earth, would flow continuously and would not be cut off by fuse links which would not blow a current up to 150 amps. At that melting point illustrates the risk from electric shock but also there is a risk from fire. This leakage current to earth of, calculated here, 4 amps is able to run through poor connections in the system and create arcing and overheating at such connections and in so doing create conditions which can ignite material which is capable of being ignited such as, for example, the insulation of wires which have already been melted through by overheating and there is considerable evidence of continuous overheating of some of these lines in the evidence that we have heard and the arcing at the point of content in these cases would be liable to ignite any such condition. As an illustration, my Lords, 4 amp. or a little under 4 amp. is a little under the current that flows in an electric fire of 1 KW and if one thing of that amounts of energy or bottled up in a badly connecting joint of very small area where a wire happens to be touching one can see that he has in that instance a condition likely to be too far which could be quite serious and it is the reason for making a connection to the earth on the neutral of the transformer. The reason for that is to eliminate this type of problem it can only normally occur in practice if the fault itself is of such higher resistance that the current is limited by that fault itself but in this case such a fault to earth causing arcing and burning would continue indefinitely and create this danger and I can understand why Mr Davidson was so astonished at seeing this particular diagram because I think like myself he did not believe that an electric authority would not ensure that the earthing on their equipment was adequate.

Q. Do you understand Mr Turner that you have expected in fact the load sheath and armouring to be bonded to the neutral earth at sub station?

A. Yes my Lord if no other system of earth

leakage protection was provided and on this diagram I see no other system of earth leakage protection.

Q. Is there a maximum earth loop impedance for earth leakage protection in such cases?

A Speaking from memory my Lord, Section D of the Wiring Regulations. Mr David has passed me a copy of the regulations for the Electrical Equipment of Buildings written by the Institution of Electrical Engineers in the U.K

The edition that we have chosen is 1966 because this is approximately the period in which the installation would have been installed although similar regulations also apply today.

Looking at table D1 in D.22 of these regulations we read :-

> "Earth-leakage protection may be afforded by means of fuses or excess-current circuit breakers provided that the earth fault current available to operate the protective device and so make the faulty circuit dead exceeds -
>
> (i) 3 times the current rating of any semi-enclosed fuse,"

and to assist engineers there is a table D1 giving a maximum earth-loop impedances for earth-leakage protection by semi-enclosed fuses and we could assume that when this installation was made this option of this installation was considered as a current rating of 60 amps. We know that subsequently the installation was mis-used by the rewiring with Twin 18 GW but at the time of installation it would have been a maximum of 60 amps and in that case the earth leakage impedance should have been a maximum of 1.35 ohms.

Q. And not 61?

A And certainly not 61. You understand my Lord that 61 amp. the dangerous leakage to earth is not switched off because the only thing as far as this diagram shows that can switch it off is the blowing of the fuse while the current flow into earth. We had not previously considered this as a cause of fire because it is known to be a dangerous situation which is always obviated by these regulations which was specifically made by the institution of electrical engineers to avoid such dangers of electrocution and fire.

Court: This book has not been produced.

Mr David Q.C : My Lord the book can be produced.

Court: We should like a copy of the passage

Mr David Q.C : Yes or the passage can be photocopied

Q Mr Turner, so the calculations that you made in respect of resistance of cable, sheath and armouring before you came upon this diagram. Do you want to put them in, do you want to say anything?

A. Well, they are of interest because they show that if the Electricity Board has made such a connection and the first interpretation of my question the question I received was to see whether the Electricity Board was complying with the further regulation D29 which is clearly there to protect against electric shock and I'll read out regulations D.29 :-

> Every earth-continuity conductor former wholly or partly by metal conduits, ducts, or trunking or by the metal sheaths and/or armouring of cables, shall have a resistance not more than twice that of the largest current-carrying conductor of the circuit

Now my first impression was that the value of resistance mistakenly telex as ohms was actually perhaps 60 m. ohms had been stated in Court and that it was necessary for me to calculate the resistance of the armouring on the sheaths of the cable in order to verify that this could be the case that I would explain, my Lord, that at the time this cable was manufactured, the manufacturers did not state the resistance of their armouring, they simply gave its dimension to specify the sizes and so it was necessary to calculate this. I made these calculations and in fact the resistance of sheaths and armouring is only slightly greater than that of the current carrying conductor as can be seen in the calculation which is the calculation of ohms per thousand yards whereas the conductor resistance can be seen as o.43 ohms per thousand yards according to the information given by Cable Manufacturers and consequently this sheath and armouring if they had been bonded to earth at the neutral point of the transformer would have provided an adequate earth for the purposes of protection against electric shock and fire

Q Therefore the calculation that you made in Mauritius led you to reach the result of 4 amps in respect of

A A little under 4 amps, my Lord, but it's 230 which is a little under 4, 3 77

61

Q Now therefore these calculations, you now reach a figure of 4 amps where do you go from there in respect of the question of arcing or the question of blowing of the transformer or something like that?

A Well setting aside these dangerous aspects of this installation which are really a separate question which I think the CEB should consider very carefully quite outside the aspects of this case. In this particular case we know that due to the over wiring of the fuse in the Henley box, there had been persistent overloading in the substation. We know this because evidence which has been produced in this Court by the witnesses that have spoken since then. The overloading of this trunk will produce heating in the wires going out of the box My experiments and the ASTA experiments have shown that for current exceeding 120 amps. the cable conductor is getting to a temperature in which it will move in its conducting sheaths which were in fact melting and moved on one side and the speed with which it does that depend upon the degree of overload. It would do this until it touches the edge of the box and when it does this, it will touch rather badly probably because of this being surrounded by other material from the decomposition of the insulation and it will arc and spark like any bad contact is likely to do. This will overheat the conductor in the approximity of the part from the top of the Henley box. This overheating will in time produce progressive deterioration and it's likely that the cable under this lay and down to the contacts would run perhaps even red hot because of these conditions. It is rather like taking an electric fire, disconnecting one wire and just touching it on repeatedly creating arcing and sparking. This, in time, could ignite this already overheating cable and start a process which could cause molten flaming PVC dropped on to the inflammable material surrounding the box. So this provides yet another means by which the electrical faults in the installation of this installation (if I may use this word twice) in which these electrical faults can have caused the fire in this particular case.

Q Without meanwhile affecting the transformer

A. The whole point of this poor earthing system is that such faults would persist without

affecting the transformer at all. They would go on indefinitely and whereas there might have been noticed if the unit were in a semi public place. The fact that they were in a locked room would mean that this could season away from what time without anybody noticing it.

There is another possible fault that would have come as well in this case if there had been any loose wire as it sometimes knows between neutral and the case of the box. This type of fault would not be detected any connection between neutral and the box because the neutral is substantially at earth potentially but in the event of the wire touching the case this would create a connection between the neutral conductor, the case of the box back through the conductor which is touching the base to the live side of the length creating a short-circuit which would evaporate such a connection, a piece of wire or whatever, and if that wire is a smaller cross-section than the double fuse wires then it would not blow the fuse wires but would create either a short explosion in the box but would then immediately be clear or alternatively start another arcing in the box between the neutral bar and the box case. Such a possibility would not have been there if this box had been adequately earthed.

Q. So I think you have covered every aspect?

A. I think this is covered by every aspect which I wished to cover.

Sir Raymond Hein, Q.C.: Can we reserve the cross-examination after recess My Lord?

Court: Yes certainly. Anything which I grasp from it are the last two lines. I think that the last two lines give the result of your calculations?

A. Yes and they show that the impedance of the sheath and the armouring of the cable is approximately the same as that of the conductor

Court: Alright Cross-examination is reserved.

No. 49

EVIDENCE OF THOMAS WOODCOCK

Woodcock examined by Mr Moollan Q.C.

Q. Mr Woodcock, you have set down a document which has been produced on your curriculum vitae and your experience in all forms of electrical supply and servicing?

A. That is so my Lord.

Q. You have also put in two folders giving information concerning Preece Cardew and Rider to which you are presently attached?

A. That is so my Lord.

Q You produced a report which was finalised on 7th March 1978, a copy of which has been communicated to the plaintiff

(Document BA produced)

Q. Attached to the report are four appendices being your calculations for the fault level of the box?

A. That is so my Lord.

Q. The two documents which have already been produced concerning the tests made in order to determine the resistance to earth?

A. That is so my Lord.

Q. And another document already produced being what you call family of curves giving the characteristics of HRC fuse?

A. That is correct my Lord.

Q. The first part of your report in the first 1 two paragraphs we have mentioned the association with your present firm and in the third paragraph of the test which your firm ought to be made at ASTA?

A. That is true my Lord.

Q. Both ASTA reports have been produced in Court?

A. That is true my Lord.

Q. Taking first of all, you are dealing with the temperature rise test which is report(a) of the ASTA test report?

A. That is true my Lord.

Q. Four tests were made which are set out in the sheet No.1 under the heading Schedule of Test?

A. That is true my Lord.

Q. And those actual tests are then given, the results of those tests are then given in complete

detail under sheets No.6, 7, 8 as regards the first test; 9, 10 & 11 as regards the second test; 12, 13 as regards the third test and 14, 15 & 16 as regards the last test?

A. That is so my Lord.

Q. The purport of the test was to ascertain the temperature rise in respect of each test and each test condition mentioned?

A. That is true my Lord.

Q The tests were to be carried out in a confined space of 2 meters by 2 meters would still air condition an initial temperature of about 28°?

A. That is so my Lord.

Q. The first line of each report indicates the temperature at the beginning of the test at the time of each test begins?

A. That is so my Lord.

Q. Annexed to the report are a series of photographs?

A. That is true my Lord.

Q. The first one in the ASTA report indicates the installation. Photograph No.13951 shows the installation. It also indicates the topping from which the temperatures were taken and the bottle on the left indicates the ambient temperature was taken throughout the test?

A. That is true my Lord.

Q. In this text the three phases were analysed?

A. That is true my Lord.

Q. There is where one finds 4 outgoing cables on top?

A. That is true my Lord.

Q. The fourth one is the one of neutral and the connection was made on top which is the start point. The reference to start point is the difference of the test results would at at that top?

A. That is true my Lord.

Q. This is one variation with the ERA test where only one test is analysed to 3 sets of fuses and coming back?

A. That is correct my Lord.

Q. Photograph 13952 indicates various points inside the box where the temperature is given?

A. That is true my Lord.

Q. So far as the photographs are concerned, reference is made in the body of the report?

A. That is true my Lord.

Q. At the end last paper in that report is a sketch, that sketch itself apart from the reference to it, represents the makers' drawings relating to the box which was being considered?

A. That is true my Lord.

Q. And you put in the makers' drawings

(Document 'BB' produced)

Q. In paragraph 2.3 you have stated that the purpose of your test was purely objective in order to discover how the Henley box would react temperature rise in relation to the test which has been made, loads greatly in excess of the designed rating of the box?

A. That is true my Lord.

Q. Turning to the first test page 6, 7 and 8 of the ASTA report when the box was subjected to a test current of 80 amps per phase with the 2 x 18 SWG fuse wire were installed and slightly less than 6 hours one can see that constant temperature was reached?

A. In that occasion constant temperature was reached and by the present terminals stability is defined as the condition of the box when it will not rise more than $1^{o}C$ in one hour. That condition was reached just under 6 hours.

Q. Under that test the highest temperature recorded would be at page 8 column connection 8 - 85.4 by 15 hours. The other tests are also fully described and the temperatures are set out and in so far as test No.3 is concerned it might blow in 16 minutes when the test ended. The 150 amps phase 2 x 18 SWG fuse wire page 13 of the test started at 10.30 and was submitted at 10.46 and the several temperatures at different points are also recorded throughout the testing?

A. That is so my Lord.

Q. Relating to those tests to the facts of the case you come to paragraph 2.4 of your report you conclude that on a 80 amp. flowing through 3 phase and with the fuses wire with 2 x 18 SWG fuse wire no damage to the PVC could take place?

A. That is so my Lord.

Q. We shall skip over paragraph 3 after the cross-examination of Mr Turner, we turn now to chapter 4. Mr Davidson in paragraph 7.20 of

his report has adumbrated what would be the lightly fault level at the Henley box?

A. That is so my Lord.

Q. And was estimated that figures as being very probably 3500 amps or may be less. You have looked into the installation and you have actually made calculations in order to ascertain what the fault level is?

A. That is so my Lord.

Q. The different steps of your calculations are to be found in Appendix A of your report. The first page which is a diagram shows in a long line diagram from the whole of the supply line from the power station to the fuse box would indicate of different equipment along the line?

A. That is so my Lord.

Q. You have then in four different calculations relating to each of the different type which totals up to 6136.74% which gives us to 2,353 amps per phase?

A. That is so my Lord.

Q. You have then in paragraph 4.2 of your report stated that in the event of an interphase, phase to earth, the fault current attained is 2350 amps?

A. That is correct my Lord.

Q. Then with the use of the 4th appendix in your report which is appendix B going down the line 160 MJ curve and working it out along that curve you have ascertained that at such a fault level a 160 HRC fuse will rupture in 13 milli seconds?

A. That is so my Lord.

Court: Would you please remind us of the signs MJ, PJ & SJ?

A. It is the fuse type manufacturers' designation.

Court: I have never been an expert at graphs. I would like to know how you read

In paragraph 4.2 is it 10 or 13 milli seconds

Mr Moollan: 13 milliseconds my Lord.

Q. We shall have to go down to the 8th line at the bottom to find the curve which we should be concerned.

Then one has got along the same line for a point which will correspond to 2350 it will be beyond the 2,000 figure mentioned which is the line preceding the one we observed and fixed a point on the graph which is

equivalent to 2350 and then draw a vertical line from that point and the point of intersection of that line with the graph of the curve which we are concerned will give us a point which will blow in time?

A. That is correct my Lord.

Court: The value between 10 and 100 milli-seconds - .113

Mr Moollan: It is extremely difficult for me to read graphs.

A. Starting at the bottom we have .005 then we got .01 and then the line .015.

Q. You have worked out 13 milli seconds. How can you be sure about that figure in relation to the HRC fuse?

A. The HRC fuse is a fuse that can be given a definite characteristic in relation to current against fusing time. It is enclosed in a ceramic barreau which is hermetically sealed no oxidation inside that barreau can occur. This is a far better fuse than the open wire or semi-enclosed type fuse where no discrimination can really be calculated. It is an approximate type of fuse.

Q. Is it correct to say that the HRC fuse is a precise and exact calculation in milli second whereas for an open or semi-enclosed wire fuse this not exact and there may be variations?

A. That is true, there may be variation, the rating when one goes to the wire fuse it has a current rating and all that the manufacturers who say on the fusing that it will approximate to twice to its normal carrying load?

Q. You have stated in paragraph 4.3 that in your opinion a current of 2350 amp. persisting for 13 m. seconds is not sufficient to raise the temperature of the box, by any significant amount?

A. That is correct my Lord.

Q. Do I understand that if there is any phase to phase fault that HRC fuse protecting the box could blow within 13 m. seconds and there would be no significant raise in temperature in the box?

A. That is correct my Lord.

Q. Since we are dealing with those fuses you have told us that the open fuses are not absolutely precise specially to variation. What are the factors which would affect those variations?

A. Factors which could affect the open type fuse will be the method in which it is installed how it is handled and the load cycle which is going through the fuse heating and pulling cycles.

Q. Now if a particular fuse wire is underfused in relation to the load which is imposed on it, what will happen?

A. The fuse will over heat.

Q. And how does that affect the life of that fuse?

A. It would reduce its life my Lord.

Q. Does that mean that on the way from blowing the fuse will heat and gradually its life cycle is impaired and its resistance is lower?

A. Its life cycle is reduced my Lord.

Q. If you have two fuses of equal rating, one of which has been in use underfuse for a longer time and some fault developed which of the two fuses would be affected?

A. As I said earlier my Lord the semi-enclosed fuse and the open type fuse characteristics are not scientific. The question that is just being asked I would suggest that the fuse that has been carrying the heaviest load would blow first.

Q. Two fuses of equal rating then may be the old one is more likely to be affected but if we have a fuse wire and the fuse wire of double up that same fuse wire and a fault condition occurs, which of the 2 fuse wires would be affected?

A. As I said earlier my Lord the semi-enclosed fuse and the open type fuse characteristics are not scientific. The question that is just being asked I would suggest that the fuse that has been carrying the heaviest load would blow first.

Q. Two fuses of equal rating then may be the old one is more likely to be affected but if we have a fuse wire and the fuse wire of double up that same fuse wire and a fault condition occurs, which of the 2 fuse wires would be affected?

A. As this is not an exact science on the semi-enclosed fuse I would not like to express my opinion. It could in my experience I have seen two faults and have been led to the wrong fuse and I have found one with a greater strength blowing before the smaller fuse.

Q. Turning now to chapter 5 you have looked up and examined the overhead cable which came

from outside the Bata Warehouse and fed the 3 consumers in the building across the road in which were those 3 consumers?

A. I have examined those cables.

Q. And those lengths of cable have been produced and are in Court?

A. Those are the cables my Lord.

Q. Then you have caused the lengths to be cut from each of the 6 cables?

A. I personally witnessed the cutting of the 6 cables.

Q. And you caused the cutting to be done at which end, there is one end which was at the Bata end the other is the consumer end?

A. At the consumer end my Lord.

Q. And those are the 6 pieces of cable?

(6 pieces of cable produced)

A. Those are the 6 pieces.

Q. You have examined those lengths?

A. I have examined my Lords.

Q. And you have concluded as you stated in your report page 4 that those cables had not deteriorated due to overheating which itself be due to overloading?

A. That is correct my Lord.

Q. And you have further noticed that there has been no softening of the PVC insulator consumer?

A. That is correct.

Q. Can you explain why you chose the consumer end of the cable to cut and examine?

A. The reason was that the Bata end of the cable was twisted up and badly burnt and it shows also the method of connection of the cables of the Bata Building.

Q. Would the overheating due to overloading show itself at whatever end or whatever part of the cable one examined?

A. Yes my Lord.

Q. Why that?

A. Because it has the same heating effect. The current is the same all the way round at the beginning or at the end.

Q. So in that way if one can ascertain whether any sign of overheating of a conductor is due to the outside source or to overloading?

A. That is so my Lord.

Q. You have set out in chapter of your report what you have ascertained from tables as far as information is concerned concerning PVC?

A. That is true my Lord.

Q. And we'll find that on the first test in the ASTA report which is for 18 going through the 3 phases the material figures are nowhere being reached?

A. That is true.

Q. If you would refer to the life size diagram manufacturers of the box that has been produced there is a diagram which gives a sight view of that box when closed?

A. Yes there is a sight view of the box when closed.

Q. Which itself is reproduced in the last diagram of the ASTA report?

A. That is so my Lord.

Q. We notice on that diagram a gap between the top which also forms the handle of the fuse carrier and the lid of the box?

A. That is so my Lord.

Q. In the light of this diagram and your own experience is that lid meant to be in actual, physical contact with that top of the fuse carrier in order to keep, hold and press it in position of the time?

A. No it is not mentally in contact with the lid. The fuse as shown here is correct, it is clear on the lid.

Q. And this comes from the actual manufacturers of the box?

A. The original came from the manufacturers. The modification shows its outgoing conductors from test purposes and also the incoming cables.

Q. I think there is a matter on which there is evidence is that by making the necessary adjustments at the back of the lid the screws one can get it to be in that position but that closed that box properly if those adjustments are necessary?

A. That is the purpose of the adjustments on the lid.

Court: What would be the use of having those adjustments if it was something fixed and if the clearance was provided for, what is the use of adjustments for? If something is made there is no reason why it should be altered, you have many boxes which are made

without any adjustment to the doors so if it is not meant to be adjusted for some reason or other I don't say that your potential is not correct or their is not correct but there must be something, according to your clearance, what is the use of having those adjustments if by using it somebody may make a fault and failed to read that clearance or the other way round. If the person fails to have that clearance for some reason or other will make a difference to the working of the box. I just wonder why those adjustments should be there, have you any idea?

A. I haven't my Lord. I don't think I can suggest one, apart from the fact that if the gasket inside the box deteriorated in any way it would be possible to put more pressure on to the gasket when one adjusts the affixing the hinge screws and when fixes the last part of the lid. I agree with you that

Court: Yes it should have been made with that clearance and fixed so that nobody should make any fault about it, he closes it and the clearance is there.

Q. That lid itself is made of cast iron and is absolutely rigid?

A. That is so my Lord.

Q. What is the effect on the closing of the box if one is fixed by two bolts, one at the top and one at the bottom. If one of the bolts actually closed what is the effect of the other bolt?

A. On the closing of the door there would be no effect whatsoever, the lid cannot twist, it is not mariable and it's a cast iron.

Q. So, if one fixed the other, one must necessarily come in position?

A. It must close perfectly.

Q. Can you imagine any possibility of that getting out of line and one being able to close it off and one being able to close off?

A. No I cannot imagine that.

R E C E S S

No. 50

EVIDENCE OF HENRY WALTER TURNER

THURSDAY 9TH MARCH 1978

AFTER RECESS

Mr Hein moves to put certain questions to Mr Turner.

Q. Mr Turner, Mr Davidson deponed that circulating earth fault.....

A. On the basis of the information on earth resistance provided in the document which has been given to me, if that was the condition then existing (which is the nearest we have to an actual measurement), then in that case the current would have been 4 Ampere.

Q. You agree that this is the case, the reference was made to you and fellow expert to go to Mr Woodcock to check. Are you ready to assume that the figure calculated by Mr Woodcock is correct?

A. Mr Woodwock's measurements were made properly.

Q. Would you agree that the development which you have this morning attributed to a circulating..... far long to achieve than the original when employing Mr Davidson's calculation, the figure of 46 amp.?

A. I am afraid, this is not so, it is a different mechanism, the mechanism here is a mechanism of arcing at the exit port of the box with the circulating current proposed by Mr Davidson of 46 amp. The current we had added to the overload current existing in the conductor at that time. We have seen that this overload current could reach 140 amp. continuously or larger current for shorter time. and if the current of 48 amp. were added to 140 amp. it would cause a total current of 180 amp. This current might cause premature blowing of the fuse and thus there was a much less serious effect at the box.

I would agree however that the effect of the smaller current would take a longer time, but that time could be only minutes instead of seconds.

Q. The overall development which you have described as a possibility arising..... first of all that there was overloading and a point where softening or melting of PVC occur?

A. Yes, this is true.

COURT: Let us assume for the purpose of this question that the initial cause of the fire was sufficient arcing within the fuse box?

A. Yes.

Q. Would you think that the sustained arcing was the cause of the fire and was anterior to the fire or there might have been an exterior cause of the fire from some other source and thus causing temperature inside the box to increase and cause a short circuit?

A. I do not think the explanation is an explanation of what happened in this case my Lord. Since the external temperatures would not have been sufficient to promote arcing to develop like sustained overloading; however this overloading has been evident by the blowing of the fuse links with only a portion of the element being consumed as recorded by the witnesses, it indicates that the conductors were over-heated and would have moved and eventually untouched the side of the box.

The sustained arcing could then be developed from the situation between arcs inside the box, probably between the neutral link and the case which is the area that is borne out by the exhibit before the court. This, as I say, would be the only mechanism by which this arc would be generated.

Q. If the fire was caused by sustained arcing within the box, it would have taken some time before it can communicate itself outside and before the alarm would be given?

A. This is true because fire would be sustained some time within the box, because of the termal capacity of the box and the complete enclosure or almost complete enclosure with the exception of the gaps (at the ports, and possibly open door).

Q. If such were the conditions within the fuse box, would you expect power and light to be supplied out of that box say to Textile Industries and to Ideal Printing after the fire?

A. This would depend upon the position of the sustained arcing and also upon the value of the current of the sustained arcing. It would need to be rising to at least 50 amps. but could burn and dwell in one position at a lower current before that. This would depend entirely on how the arc burnt within the box and between which components. The current if it were arcing between the neutral

conductor and one phase would add to the current when that phase which would accelerate the chance of blowing that particular fuse. However, if it were transferred to the other side of the fuse link, it would need to pass a larger current sufficient to blow the fuse in the transformer supply which is capable of sustaining a current exceeding 200 amps. The answer to your question My Lord, is thus that in the event of the arc currents being at a sufficiently low value, that the total current drawn was less than the blowing current of the fuse for the time that that current persisted; then supply would continue until circumstances were such that the current increased beyond that value.

No. 51

EVIDENCE OF THOMAS WOODCOCK (continued)

Mr Moollan continues the examination in chief of Mr Tom Woodcock (still under oath)

Q. Mr Woodcock at page 4 of the report, Chapter 6, you mention the PVC begins to flow at 160 degrees centigrade. What do you mean by flow, is it flowing as water flows down from a tap. What is the form of the flow you have in mind.

A. What I mean by flow is not as counsel suggested as water flows from a tap. This would be a softening and it is made to move, the PVC flows down in slow movement.

Q. You have had occasion also to examine some markings on the exhibit that was found on the site of the fire, in relation to other marks. Do you in your opinion feel that these are archs?

A. I could not be definite on that. I do not think personally they are. I would expect much more damage to have occurred in the henley fuse box at the period of the flame when the arch would be persisting.

Q. You were in court when Mr Hiss gave evidence?

A. Yes, I was in court.

Q. In your experience and over your several years of work in electricity, how does an operator in the normal course of things put back a fuse carrier in a fuse base?

A. Normally, these gentlemen are trained

operators; they are trained in a certain manner. It is first essential to locate the main connector into the lower portion of the box keeping the top connector away out something at 40 to 45 degrees away. Having located it into the base he smartly snaps the fuse into position.

Q. You said those gentlemen are taught to do it. A trained operator, can you imagine people doing that sort of operation the other way?

A. Not a trained operator. It is in his early days of tuition that he is taught the correct method of inserting fuses, because on occasion at testing, he does not know, there may be a turn out, what we call "waiting loading" to have the supply of consumers restored.

Q. It has been suggested that inserting a fuse on load time is a hazardous process?

A. I would not agree that it is hazardous if carried out correctly as taught.

Q. Is it a very unusual thing to do to insert a fuse on load?

A. It is being done thousands and thousands of times every day all over the world.

Q. What would you think of changing a fuse base actually with the load on from the incoming side?

A. I would think that it was a very dangerous practice indeed and on that box in particular I would under no circumstances instruct any workman to change the base unless he first removes the supply, in this case the fuse of the transformer.

Q. You were also in court when witness Mamdally deponed?

A. I was in court.

Q. We have heard that there was a short piece of wire which would have been changed. We know the wire is a black PVC shea ..... and PVC insulated at 14 inches there is something which is the cover. What do you think of such an operation over that length of wire which is alleged to have been changed?

A. As an engineer I cannot see someone cutting and joining something that is 14 inches in length. The obvious solution would be to change the whole piece of wire.

Q. We know that there were 14 strands in that one cable?

A. That is true.

Q. What would joining one piece of that wire to the other piece of the same wire, what would that involve?

A. One would have to remove the insulation, then marry every strand.

Q. Taking and joining each and every one of those 14 strands there.

A. One would do it by cutting the conductor and stripping it back exposing the 14 strands and then joining it, that is, twisting every one of the cords. This is an elaborate job.

Q. This particular operation would have to be done twice over, one at the top and at the bottom?

A. If he was inserting the piece in the centre. He would cut the bimetallic and then carry on the operation.

Q. It would also mean unshaving the other two pieces, the top to which the middle piece would be joined?

A. That is so.

Q. You have also heard Mr Mamdally speak of the wire which he saw being crumbled. Can you think of PVC being crumbled?

A. Only in the case of PVC having been exposed to fire

Q. The heat which would cause it to flow would not make the PVC to crumble?

A. No.

Q. It must actually have burnt?

A. I am saying that actually it would be burnt.

Q. If we were to turn back to your report, page 2, Cap.3 the earth test. The appendices (b) and (c) relate to that chapter?

A. That is true.

Q. In para. 3(1), the second line reads: 'I made to carry'; it must be 'I was made to carry'?

A. Yes.

Q. In paragraph 3, the star point neutral earth of transformer equals 3 ohms?

A. I am quite satisfied that after doing the test that 52 ohms applied to burnt cable and the star point of the transformer was 9 ohms.

Q. We are all agreed that the effect of this would be that the maximum earth fault current could not exceed 3.77?

A. That is correct.

COURT: I am told to put earth to all appliances at home. If there is a fault I should be saved from a shock. When you talk about earth faults, this is a fault caused by earth?

A. This is a fault caused by a live conductor transferred to the earth.

Q. And sent back to the circuit?

A. And sent back to the star point of the transformer from which the current is supplied.

MR MOOLLAN: If you look at appendix (c), the 3rd line to the left at the top right hand corner representing the 3 phases?

A. That is correct.

Q. The 4th line is the neutral?

A. That is correct.

Q. The 5th line is the sheathe of the cable?

A. The sheathe and the armour of the cable.

COURT: This is attached separately to the box?

A. This is the paper insulting cable which was lead sheathed and armour which is attached to the incoming side of the henley box. The lead is armed to a brass and they are brought over the top of that and touched to the box(?)

MR MOOLLAN: There is a contact between the box and the lead sheathe?

A. Yes, and the armour wires. It is an armoured wire over the top of the lead sheathe purely as an added protection against mechanical damage.

Q. A fault current develops between RYB phase as you say in that drawing?

A. That is correct.

Q. In that case it would be an interphase fault?

A. Yes.

Q. This is the fault which you have measured and found by all the level to be of 2350, in paragraph 4 of your report?

A. That is correct.

Q. If there is a contact between those two phases that would be of the 2350?

A. A contact between the phases would give you that result.

Q. If the contact is made between that phase and the box itself then that fault is transmitted through the box and the sheathed armour to earth; this is what is called an earth fault?

A. Yes, that is correct.

Q. Eventually, when the fault finds it's way to the star point it will be back on the horizontal line up to the phase where the fault is and a loop would have occurred from the point at which the contact started through the lead to the earth back to the star point and then through that same phase again up and the loop is completed?

A. That is correct.

Q. This is what we call the circulating loop fault or earth fault?

A. This would constitute the part where the fault is.

Q. In this case, as it is not bonded, you have got to adopt the 52 ohms which you find there with the 9 ohms which makes you get the 61 and then that loop is made to turn off to the point of the transformer?

A. Yes.

COURT: The star point can be anywhere?

A. Not on the circulating side of the transformer.

Q. When it reaches the earth through that leaden sheathe armour it comes from the box and from there how did it get to that point?

A. The 52 ohms is the resistance to the general mass of earth as Mr Turner explained this morning. It flows through to the 9 ohms and from the 9 ohms at the point of start. At the CEB it is a brass iron plate having been galvanised.

Q. Through the earth it communicates from this one to this one?

A. We add the 52 to 9 ohms to get the 61.

MR MOOLLAN: You have in paragraph 3(4) considered the effect of the time on the hessien service going round the cable?

A. Yes.

Q. We are all agreed that around that cable surrounding the armoury is a piece of cloth which in the technical word is called the hessien service?

A. Yes.

Q. In the normal course of things as time goes

you have said that this service will deteriorate?

A. That is correct.

Q. Which would have for effect you said that the armoury would be in direct contact with the mass of earth?

A. That is correct.

Q. You have measured the situation now and you have found that the resistance is 52; when is the resistance higher or lower or the same, when the hessien service or the same, when the hessien service of that cloth has stood the time it is deteriorated or when the armoury is in direct contact with earth?

A. It is high when the installation is first made, the hessien then is in new condition, it is not in contact with the earth.

Q. In effect if in 1978 you have measured the resistance to be 52; in 1972 when the hessien service was new, it must have been higher?

A. That is true.

Q. It has been suggested that climatic conditions may also affect the resistance to earth?

A. It has been suggested that that could be possible.

Q. You have sought information from the head office relating to rainfall in 1972 over 21 days and 60 days prior to the two dates: the date of the fire and the date you made your test?

A. That is true.

Q. You have ascertained that at the period of the fire if anything, it was wetter than at the time you did your test?

A. At the period of the fire it was dry.

Q. As a result, if anything, at that time the resistance would have been higher not lower?

A. The resistance at that time would have been higher than on the date of the fire. I would suggest that it would only be slight. The more significant factor is the condition of the hessien service.

Q. You conclude, you round it up to 4 amps. in the circulating current, in your opinion can such a current severely damage the door leave alone cuts at the henley box?

A. The current of 4 amps, is much below to that

required to make damage to the door and the henley box.

Cross-examined

XED by Mr David:

Q. Mr Woodcock, I think I am going to invite you first of all to a consideration of the faults log book, so that from there we may have an idea of where we stand and we can proceed. If we look at the first entry of the 25th May, we know that the yorkshire cut outs had not yet been installed and therefore it would be a direct supply from the henley fuse unit to Ideal Printing and Diamond Company?

A. That is correct.

Q. We have also been told that in those days the henley fuse unit had three single phases of 18 SWG?

A. That is correct.

Q. If on any such occasion one of the fuses of the henley blew what would be the possible causes?

A. There are two causes: (1) short circuit, (2) it could be overloaded.

Q. When you say overloaded you would be thinking, being given that the fuse wire was of 18 SWG, you would be thinking of what, how much?

A. Something of the order of 75 to 80 amps.

Q. You mean to say that the fuse would blow at that amperage?

A. The fuse would blow at that amperage.

Q. We have been told that the working current for the 18 SWG is of the order, is it 50?

A. 45 amps.

Q. And the fusing current would be therefore of?

A. 75 to 80 amps.

Q. Let us look at the entry of the 5th June; we have thereby that time there has been installed the yorkshires?

A. That is true.

Q. On the 5th June at Imprimerie Ideale, there is one phase missing, outdoor fuse blown. That would mean that one of the yorkshires would have blown?

A. That is true.

Q. That would signify one of two things, either a short circuit or an overload of the order of 75 to 80?

A. One or the other.

Q. On the 16th June in respect of Textile it would be a similar situation. On the one hand you have fuses (in plural) blown when you come to actual fact, you have control fuse blown. At any rate there would be at least one that would have blown; so it would have been the same situation; one of the two possibilities that we have considered on the 5th June at Imprimerie Ideale?

A. That is correct.

Q. And again on the 27th June, same situation in respect of Textile?

A. Yorkshire fuses, yes.

Q. Let us ask whether you would have expected the people responsible for the installation to have checked into the causes of those fuses blowing?

A. Yes, I think I would; but this was done because they knew at the time that the consumers were bringing machines and altering their wiring. The CEB had no control over their activities.

Q. I shall thank you to answer my particular question. I am afraid you cannot be allowed to depone for contractors, for consumers or anything like that. Would you expect the workmen to control.....

MR MOOLLAN: There has been evidence that at Textile and Imprimerie Ideale over that period, there were contractors working and making installation. So the witness has been making reference to that.

COURT: It will be for the court to decide.

MR DAVID: On the 28th June we have trouble this time at the henley fuse unit?

A. That is so.

Q. We have been told that on that day workman Jupin there and then twisted together 2/18 SWG wires and stuck into one of the fuse carriers at that unit. What do you think first of all of what was done. What is your opinion on that?

A. First of all I would not have done that. That is only my personal opinion.

Q. Why would you not have done it?

A. In the first instance I would have noted that the rating was above and the correct fuse was 17 SWG. In the circumstances I may have made the choice of what is to be done. He knew quite well that a fuse had been replaced; he also knew at the time that a single 18 SWG was well underneath the rating of the henley box; well underneath. It could have gone up 33⅓, from 45 amps to 60. I would have put 1/17.

Q. Two of 18 is higher than the rating of one of 17?

A. I agree.

Q. You personally you would not have gone beyond the rating of 1/17?

A. Had I had a 17 gauge with me on the instance if I am that man in question who attended that fault, I may have put in 2/18. I do not know in what situation he was placed.

Q. Why does a manufacturer give information as to the rating of any particular fuse unit?

A. Because he has tested that box and he knows on account of safety that 60 amps would be its formal rating on the continued basis.

Q. You say that it would be good practice to exceed the recommended rating of the manufacturer?

A. No, it is not so.

Q. Are there implications. Can there be consequences flowing from not following this good practice?

A. It could be in certain circumstances.

Q. Which ones?

A. If the box had a rating and electricity is allowed to pass in excess, because evidence has been adduced that that box had a very conservative rating, there would be certainly over heating in that box.

Q. And over heating would be specially at what part of that box?

A. As we found in the ASTA test and also in the ERA test the highest points of temperature were at the earth going connections of the fuses.

Q. You have mentioned the conservative way in which this unit had admittedly been built. You will agree that that in itself would not justify non following of good practice?

A. I do not agree there My Lord. This rating and what could be applied to the box could be well in excess of the 60 amps.

Q. Who could say that?

A. The manufacturer could say that.

Q. The manufacturer has recommended a maximum of 60 amps.?

A. It is rated at 60 amps.

Q. According to you putting 2/18 would then increase the fusing structure of that unit to how much?

A. 75 to 80 amps. on a continuous basis. That means the current has to be in an overheated box.

Q. What would be the fusing current of that box fused to 2/18?

A. Something in the order of 155 to 160 amps.

Q. I am talking of one fuse of 2/18 as it is alleged was done on 28th June?

A. I understand that perfectly.

Q. On the same day, the 28th June, we see Textile having trouble very few minutes afterwards. Let us go to the 28th. Imprimerie Ideale one phase missing, reported at 8.45. The workmen come back at 8.55 after inserting the two No.18. Within 5 minutes there is this time a report from Textile reporting that one phase is missing and it is seen that one yorkshire was blown. Does that suggest anything to you?

A. It could suggest that a fuse at Textile had blown at the same time as the report from Imprimerie Ideale.

Q. Without its being noticed?

A. Without its being noticed.

Q. We now go to the 1st July. We see again Textile, a phase missing, control fuse oxidized. What does the oxidization of the yorkshire suggest to you?

A. I have never come across the word oxidization before a fuse being blown until I came to Mauritius. Oxidization attacks copper when it loses its outer appearance, but oxidization of a fuse which has been referred to in this court is my first instance.

Q. You heard the workmen give evidence yesterday and he stated that apart from the fact that the fuse had blown. Rosalpa deponed yesterday and explained that the fuse had blown but that parts of the contact blades had blackened.

What significance would you attach to that?

A. It would appear to me that there had been some over heating of the contact.

Q. As a result of what?

A. Of load passing through. Normal perfect contact. It could be done with a normal load.

Q. You would not say that oxidization is a symptom of overloading oxidization would be normally the result of an overload?

A. It could be the result of overload, but basically it is a condition of bad contact between the surfaces.

Q. The condition of bad contact being due to what?

A. Mal adjustment, mal adjusted fuse.

Q. The 5th July, we have the three undertakings deprived of power. One fuse blown the cable box; and evidence has been led to the effect that a second fuse was then over wired to 2/18?

A. That is correct.

Q. What according to you would then be the implications of the two fuses being thus over wired?

A. There will be more overload through the box. It gives the facility to pass more current through the box.

Q. Finally, we have the 6th July, all the three undertakings again losing power and apparently of the third fuse being blown in the fuse box, the result is that for this last fuse we have 2/18, so that now we have three lots of 2/18 in that unit?

A. That is correct.

Q. What would be, finally on this point, your opinion of this practice?

A. I have to say that the practice is not to be recommended.

Q. Would you agree that it could have unfortunate consequences?

A. That would depend on certain conditions occurring at the same time.

Q. Those conditions being?

A. That load in excess of the box had to be supplied, in excess of the rating of the box had to be supplied.

Q. You have yourself brought in in your report

the evidence relating to the fact (App.c) of the lead sheath and the armour not being bonded to neutral earth at the sub-station. When did you first become aware of this situation?

A. Before I took the test on the 21st.

Q. It was the day on which you visited the sub-station for the purpose of that test?

A. The day I went to the sub-station for the test was Tuesday 21st. It was a mauritian holiday. I became aware of this on the 20th.

Q. From being told or from seeing?

A. The first indication I had of this was when Mr Davidson's report came through and he told me that the earthing conditions in Mauritius could be difficult. I then made certain enquiries at the CEB in Port Louis and as a result, I wished to visit the transformer. It was a natural thing to do. Looking at the installation I did ask a question of the gentleman about the bonding of cables and sheathes and the armour at the transformer position. It was not evident from the personal inspection that binding had taken place. There was only one positive was to find that and that was to conduct the earth resistence test.

Q. Did you find that there was no bonding?

A. That is correct

Q. Were you surprised at your finding?

A. Yes.

Q. What should have been the situation?

A. Good practice would dictate that the sheath and the armoury of all cables are brought to the bar and connected to the star point of the transformer

Q. Good practice dictates this to avoid what sort of dangers?

A. Earth faults persisting on apparatus.

At this state the case is adjourned to tomorrow Friday 10th March, 1978 for continuation

In the Supreme Court

Defendants' Evidence

No.51
Thomas Woodcock

Cross-examination (continued)

10th March 1978

In the Supreme Court of Mauritius

On Friday, the 10th day of March, 1978 at 10.30 a.m.

Before the Honourable M.Rault, Acting Chief Justice
the Honourable P de Ravel, Puisne Judge

Mr David resumes the cross-examination of:
Mr TOM WOODCOCK (Sworn)

Mr Moollan: My Lords, I have already mentioned the matter to my learned friend, but there was one question which, I apologise. I had completely failed to put to the witness yesterday and, as the cross-examination has not reached that point at all, may I be allowed to put the question to the witness.

COURT: No objection.

Examination (continued)

Examined (continued)

Cross examination is interrupted for Mr Moollan to put the question to Mr Woodcock

Mr Moollan: There has been evidence adduced to the effect that for some time after the fire alarm was raised, lights were on and a three-phase motor was still working. If that evidence is accepted, assuming that, what is your opinion concerning the box and the cause of the fire?

A. If the three-phase motor, as alleged, was working, this would not be possible, in my opinion, if there had been a defect in the box from a short circuit in the box, a short between phases, due to, as Mr Turner has suggested at one stage, a run away arcing condition; in that case the high rupturing capacity fuses at the substation would have cleared the fault and the lights would have gone.

Court: The lights as well.

A. The lights would have gone out and the three-phase motor would have stopped.

Mr Moollan: In your opinion, if the fire had been caused by something in the box, would you expect the three-phase motor, in the circumstances, to run, sometime after the fire had started and the fire alarm raised?

A. No, My Lords, the three-phase motor would not have been working.

Court: If there was arcing in the box as suggested.

Mr Moollan: If the box had been the cause of the fire.

Court: Yes, no lights would be on and no engine would be working.

Court: Mr Woodcock, are you drawing a distinction between the motor and the lights.

A. Not in this case, My Lords.

Court: There is a possibility that the lights might go on while the motor would certainly go out.

A. If the three-inter-phase fault in that box had occurred the lights.....

Court: Inter-phase fault!

A. Yes on the run away condition, the arcing between the phase in the box, the lights and motor would have ceased to work.

Mr Moollan: If a light is working on one phase and the motor is working on three phases, can there be circumstances in which there might be light but there cannot possibly be the motor running?

A. Yes, if one phase was alive, lights could be working, but the motor, under these circumstances, would be single phasing, what is referred to as single phasing, consequently would lose power and eventually would stop.

Mr Moollan: In that event what would happen to the three warning lights on a three-phase motor?

A. If one phase had failed one light would go out at the controls of the motor while the operator was working.

Q. The lights at that motor would indicate how many phases were in fact working?

A. That is correct.

Cross-examined (continued)

Cross-examination (continued)

Mr David cross-examines

Q. Perhaps I might just put one question on this aspect to which I shall probably be returning in greater detail later on. The present question I would like to ask you, Mr Woodcock is: if the fault for arcing condition were at a lower current than sufficient to blow the two times 18 SWG wires, would the motor and lights not still continue?

A. Yes the motor would still continue to run.

Q. And the lights?

A. Yes, and the lights.

Q. Mr Woodcock, I would like to refer the court now to your test report B 1057, that's the temperature rise test, to photo 13958. When we look at that photo we see a manufacturer's schedule; if we start from the second line from the bottom we see 0.48 and of course here we are dealing with a 18 SWG, are we not?

A. That's correct.

Court: I can't read the writing on top of that column, could you make it out. I can read the figures, I am not sure about the writing at the top.

Mr Moollan: Tin copper fuse wire.

Mr David: Now I confirm it.

Q. Mr Woodcock, as against what we know to be the 18 SWG fuse wire of 0.48 diameter - this is the henley box - we see that there is assigned a rated current of 50 amps?

A. That is so.

Q. And a blowing current of 102 amps?

A. That is correct.

Q. So this is how the manufacturer sets the situation?

A. That is correct.

Q. When we turn to the cover of the yorkshire fuse (Exhibit shown to witness) we see stated a rating of 50 amps?

A. That is correct.

Q. That, of course, would be the manufacturer's rating with one times SWG fuse wire fitted?

A. That is correct.

Q. You quoted yesterday a figure of 45 amps which, of course, is a more conservative rating, do you quote this from a table of some sort or what is your reason for quoting this?

A. I have quoted it from the tables that I have in my possession.

Q. You also quoted a fusing current of 75 to 80 amps - we are still talking about the one strand of fuse wire, whereas we can see the manufacturer to quote 102 amps - how do you obtain your figure of 75 to 80 amps?

A. As I said yesterday, the fusing figure for a bare copper wire is not something that can be scientifically determined, it is stated in the catalogue that I have, that approximately twice the rating current would flow to cause that fuse to blow.

Q. 50 amps times 2 would make 100?

A. I do not know why the manufacturer has chosen to add 2 amps on top when multiplying the rating current by two.

Q. Then we have no reason to reduce it even from 100 to 75 to 80?

A. I will consider the point.

Q. Thank you. This is the minimum fusing current which is measured at a blowing time of what would you say of 4 hours?

A. Well, it is possible to put a time on high rupturing capacity fuse and learned counsel now has quoted 4 hours which is the time at which the 160 amps fuse with a fusing factor of 1.5, it would carry that current for exactly 4 hours. This is an inexact science of semi-enclosed and open type fuses and I cannot put a time upon it.

Q. You cannot put a time?

A. That is correct.

Q. Let us put it this way then, the larger the current the shorter the time for blowing?

A. That is correct.

Q. Were you in Court yesterday when Mr Turner deponed?

A. I was in Court.

Q. Yesterday, when Mr Turner deponed, he told the court that a fuse blown on overload is only partially melted whereas a fuse blown as a result of a short circuit which rapidly heats up the whole wire is completely consumed. This, of course, is a well-known phenomenon?

A. That is the case.

Q. Now, if we turn to the description which has been given in this case, if we turn to the evidence by the various witnesses, it would appear that before rewiring - I am referring to the incident, shall we call it the incident of the 25th and 26th - it would appear that in that case the fuse had been completely consumed. I speak under the correction of all my friends in court. Now, if that is so, this would indicate that there

had been a short circuit?

A. That is correct.

Q. And, in fact, if we remember the evidence of Mr Juste to the effect that two wires had been touching inside at Southern Cross, that would tend to confirm the situation?

A. That is correct providing the two wires that were touching were phase wires.

Q. On the other hand, the other workmen who have deponed, if I have understood them rightly, have all stated that the other fuses were incompletely consumed, this, in turn, would indicate that all these were blown on overload rather than short circuit condition?

A. The indication is such My Lords.

Court: There is another reason which I think can lead to that conclusion, that is, the replacing of the fuses. If there was a short circuit they could not replace it, it would blow and as soon as replaced it would blow.

Mr David: On short circuit yes.

A. Your assumption is correct, My Lord.

Mr David: Therefore, taking this indication now, even this assumption, it would mean that on those latter occasions, that is when they had not been completely consumed, it would mean that currents of up to 102 or even more amps had been sustained in those fuses?

A. I do not agree with that at all. The fuses in question would be subject to cyclic loading, they become hot, cool down, heat up again; the age of the fuse if the fuse had been in for some considerable while, it could well fuse by a load less than 102 amps due to age.

Q. You mean to say that it would depend on the age of those fuses?

Court: That is one of the factors.

A. Yes.

Mr David: What would be the other factors?

A. The fuse when having been placed into the holder could have been placed incorrectly, that is the other factor.

Q. Any other factor?

A. I would say those are the two main factors.

Q. Let us look at Textile. On the 27th June Textile lost a fuse at 11.50 after losing

one on the 16th June, and then the very next day, on the 28th June, it lost a fuse, on the 1st July it lost a fuse. In the face of such evidence what would you say?

A. May I ask if learned counsel is referring to the same fuse that was blown every time.

Q. I am referring to the same fuse box, to the same yorkshire, in which a fuse which has not been identified has been blowing?

A. There are three yorkshire fuses to each consumer and learned counsel positively says that.....

Court: Learned counsel can't say anything, he is merely asking question.

A. Therefore all I can say is I do not know, in my own mind, whether it is the same fuse that has blown or whether, having 3fuses at that point they would all have blown at a different time.

Mr David: Would you say that the cyclic loading to produce deterioration of a rewirable fuse would need be considerably in excess of its rated current.

A. Yes, it is reasonable to say that.

Q. So that if it blew, it might not have 102 amps, it would have been at least 80 amps?

A. Would you ask the question again.

Q. So that if it blew it might not have been at 102 amps it would have been at least 80 amps?

A. It would have been at least 80 amps.

Q. And it need not have been 102 amps?

A. That is correct.

Q. So depending, let us say, on the actual fuse that blew in the yorkshire cutout that we are talking about - I shall not deal with statistical possibilities or chances, let us leave that aside for our argument - if the same fuse blew more than once then would you say that the condition to which I had been referring could apply?

Court: During that period.

A. Yes it would.

Mr David: Let us, for the sake of argument, I repeat, for the sake of argument, let us say that a current of between 80 or 102 amps had flown through in respect of one of those consumers' at the same time, of course, the two other consumers would have been drawing current, at what, even conservatively, would

you put, let us say simultaneously, the contemporary supply of current in respect of the two other consumers?

A. The two other consumers were also drawing....

Q. We have been dealing with Textile, we are going to assume between 80 and 102 or even more in respect of Textile, at the same time the two other consumers would have been drawing what sort of supply conservatively?

A. In the region of 35 - 40 amps.

COURT: Each or together?

A. Together.

Mr David: How did you reach that?

A. If I might say so, I would prefer this question to be asked to my colleague who has been working on this side of the case.

Q. Did you say 40 to 45?

A. About 40, but I would like to say that is again not my part I have not been intimately connected with that side of the case.

Q. Even if we take 80 + 40 we get 120 and if we take 100, 102 + 40 we get 140?

A. Yes.

Q. That would be the aggregate for the henley box?

A. Under certain conditions?

Q. Yes.

A. But they would not be persisting because we are talking about starting currents of motors which would be only applied to the circuit for a matter of one or two seconds, it is not a continuous current that is passing through those fuses.

Q. Let us take the case of Textile. Would it be a fact that the Textile load would have been split up in three phases with single phase motors - there were sewing machines, iron machines?

A. That is correct the sewing machines were in fact single phase motors.

Q. Would that mean that Textile would have been using those sewing machines, as you say, connected only to one phase, in which case one would have a load of only - I was going to say a third, in fact if we use 80 amps we would have arrived at 11.8KW by giving a current of 80 amps on that one phase?

A. It would be very bad practice indeed if it were found that all the number of sewing machines were connected to one phase only, the normal practice is to balance the single phase load over the 3 phases and so reduce the outer balance current in the neutral.

Q. But if they were all on the one single phase, then that would be the position?

A. That is correct, that is your supposition.

Q. I am afraid, Mr Woodcock, that in certain parts, for instance, in respect of 30 or 40 used by two others, even yourself and I are dealing with suppositions, we will wait and see what Mr Sharples has to say?

A. I would prefer it that way, My Lords.

Q. You just mentioned that that condition of overloading would be for a few seconds, would you agree that to blow the fuse on minimum fusing current can take 4 hours?

A. No I would not agree with the semi-enclosed fuse, I do not know the time that would be taken. It is discernible and accurately measured when one comes to high rupturing capacity fuse with a known current passing it is possible to ascertain the time at which the fuse will deteriorate and open.

Q. But in the condition that we are considering it can be much longer?

A. It could well be, as I have said, I do not know.

Q. At the time that you started the experiments - when I saw you started, I mean when the ASTA started up the experiments, I shall say you for the sake of convenience did you know the size, the type of wire which had been used in the henley box in Mauritius?

A. The instructions that I had, as you are referring to me, was that the size and conductors were as given by Mr Sharples to me.

Q. What was the description that had been given to you of the outgoing cables?

A. Exactly as shown in the Test specification.

Q. That is when we turn to the outgoing cable it would be 4 single 5mm diameter solid copper outgoing connection?

A That is correct as outlined on pages 2 and 3 of the ASTA report.

Q. Now that you have come to Mauritius would you say that that specification was correct?

A. No, I do say now it was not correct but I would like to add that the test in no way has been affected, if it has been affected, the conditions under our test are far more.....using the bare copper conductors.

Q. You used solid copper conductors?

A. That is correct for the purpose of the test.

Q. In practice the cable was stranded.

A. Yes in practice the cable was stranded.

Q. Do you agree that the strengths are compressed by fastenings at the termination of the cable?

A. I do. That is the normal method of affixing when one screws into those strands and gives a connection.

Q. Would not this give very different contact conditions to those with solid rods.

A. I would not say it would be much different at all.

Q. The cable in practice, the actual cable, was insulated by PVC, of the type specific for this purpose?

A. You are referring, do I take it, to the cable used in Mauritius?

Q. Yes.

A. I suppose this is the sample here which we all have seen, that is true.

Q. In the test done by ASTA the rod had been simply bound with a layer of tape?

A. That is correct.

Q. Did ASTA do the calculation of the thermal transfer to show that there is equivalence?

A. Would you just repeat the last question.

Q. Does ASTA have the calculation of the thermal transfer to show that there is equivalence?

A. That I don't know, whether they did a calculation at all. If they did I am not aware at all.

Q. In fact in certain respects, I want to make it quite clear, the conditions in ASTA experiments, although admittedly similar to the Bata installation, were in fact not an exact replica of the actual condition existing.

A. That is true, but, as I have said, with the solid conductor we would not be getting the same dissipation of heat as would have been occasioned had we used the exact type of cable that was used in Mauritius a nd our

temperatures would be higher than those that were applied here, that would have been recorded here in Mauritius.

Q. At page 4 of your report, chapter 6, you have referred to certain datas on PVC. You say from tables one ascertains. Are those generally accepted norms or would you say that your temperatures are higher than accepted by some authorities?

A. The temperatures that are quoted have been obtained from my firm and I have the source from where these figures came.

Q. What is the source?

A. The source is CEGB standard No. 099905.

Q. Do you know about HILADO norms?

A. No, I am not an expert in the depths, I cannot claim the same knowledge as my friend Mr Turner.

Q. In fact, the information comes from Mr Maisey.

A. My apologies, I think that is totally irrelevant to the case.

Q. Mr Woodcock, you stated - if I understood you correctly, correct me if I am wrong - that the insulation would flow at 150°C like trickle?

A. I did not use the word trickle.

COURT: It is clear from the table that flow means something less characteristic than melt, flow is something less than melt.

MR DAVID: Yes.

Q. Mr Woodcock, would you be prepared to say that it was thick trickle?

A. I think my example was that it was like chewing gum.

Q. I think you said also that if the cable reached this temperature the insulation would have become melted enough for the conductor to move in the insulation?

A. It would move along the surface of the heated copper conductor very slowly.

Q. It would thus touch the side of the box?

A. Not necessarily.

Q. But possibly?

A. I repeat, not necessarily, there would have to be a force acting on that conductor to push it over for it to make contact with the top of the box.

Q. Your measurements at 80 amps show that at that current this would not happen?

A. That is true because the temperature shown in the test shows that the top connection only achieved a temperature of 85.4 after 10 minutes under 6 hours of test at a continuous but not a slight current.

Q. You have heard evidence about the way in which the cable had been fixed, that is, from the ceiling, how they were, although one was not quite clear about the top part of the ceiling, and then going down, they had a force, the bi-metallic connector, before reaching the unit. Would a force to move the conductor, as you stated just now, would it be the weight of the hanging cable?

A. If that cable was hanging vertically over the terminals and had been set correctly, there would be no matter of force applied to the conductors.

Q. If it had not?

A. The insulation could have come into contact with the side of the threaded hole.

Q. We have talked about measurements at 80 amps showing what could happen at that current. If there had been a poor contact in the box would not the temperature have been higher than those you measured?

A. Yes, I would agree had there been a defective contact, temperatures would have been higher.

Q. Could such a poor contact have been produced by oxidation of the contact.

A. On the test foundation?

Q. In practice?

A. One moment we are dealing with test, now we are coming to Mauritius.

Q. Yes in Mauritius?

A. Yes, if oxidization was there. May I carry on. The box had been opened so many times, many more times than in normal practice for any box I ever know, there has been so much inspection in that box that had a contact oxidized it would have been seen and the relative measures for repairs taken.

Q. That is a question of evidence which we shall leave to the appreciation of the Court. Mr Woodcock, I am going back to your test condition. When you used a higher current of 120 amps, you got temperatures exceeding 150°C after one hour?

A. The ASTA report on sheet 10 shows after one hour temperatures on the exit outgoing termination connections in excess of 150.

Q. At sheet 13 when you used 150 you got temperatures above 150°C in less than 10 minutes?

A. That is correct.

Q. Would you say that 150 amps was the lowest current in your test which was capable of blowing twice 18 SWG wire?

A. Without testing it would be possible for me to ascertain that. I would say it could blow at a lower current than 150 amps if the test went on further it would take more time, it will blow in 60 minutes with 3 SWG fuses in position at 150 amps, it may well be that it would take 30 minutes if we had applied 140, 145 amps - this is a question that can only be answered by a direct test.

Q. Did you observe that in Mr Turner's report. Would you say from Mr Turner's report that 150 amps was the lowest current to have blown wires?

A. I am just speaking from memory, a current of 170 amps could blow the fuse in 3 minutes - p.4 of the report.

Q. It is p.3, the test at 150 amps duration 60 minutes. Did you observe that Mr Turner was able to sustain 140 amps for more than 2 hours without blowing wires.

A. I do - 140 amps for 140 minutes.

Q. Coming back to Mauritius and going to the yorkshire cut outs, the fuses in the yorkshire boxes were blowing?

A. Yes.

Q. The current to blow them would also pass through the henley box would it not?

A. That is correct.

Q. But the current passing through the henley box would be a bigger current because of the current drawn by two of the consumers on the same line, obviously?

A. That is correct.

COURT: Could we take it that whenever a fuse blew on a yorkshire the corresponding fuse in the henley was carrying a heavier weight?

A. That is correct but as explained yesterday with two 18 strands in the henley box and one 18 in the yorkshire fuse normally the single 18 would blow but I explained there could be instances due to this inexact science of the semi-enclosed or open type that it is

not always the case, it is the norm that the single 18 would blow but there are occasions when the heavier fuse could rupture and the lighter fuse could remain intact.

Q. Mr Woodcock, calculations have shown that if the wires touch the case a current of approximately 4 amps could flow?

A. On that box we have all agreed now that only something in the region of 4 amps would flow.

Q. In which case the fuse would not blow?

A. The fuse would not blow.

Q. You heard Mr Turner say yesterday that 4 amps approximate the current taken by 1KW electric fire?

A. That is correct if the fault is on the box.

Q. If you connect such a current by a poorly touching contact, yes it is a hypothesis, if you connect such a current by a poorly touching contact surrounded by melting and decomposing insulation is it likely to spark an arc at the point of contact?

A. I agree it is liable and could spark at a point of contact across the box.

Q. Would not this heat the material locally to a higher temperature?

A. That is correct.

Q. I am advised to put it to you that if this situation were to persist unobserved and caused progressive deterioration it could eventually ignite the decomposing PVC around the spot particularly if the temperature had risen to high levels due to deteriorating contact inside the box. What would you say to that?

A. I think that question is in script by Mr Turner.

Q. Mr Woodcock, let me make it clear that every single question I am putting to you has been necessarily put to me by my expert. I have made no secret about it; it has, in fact been duly typed out?

A. I am not inferring that it has not. Well, the case you have mentioned there would be some heating and this would tend to build up within the box, I do agree.

Q. In that case, I say again if, we have established that there were currents in excess of 80 amps flowing in the box would you not then agree that the conclusion at the bottom of page 4 of your report would not stand, that is, page 4 of your report I

read: "therefore it can be concluded that with the load conditions on site and the henley box never reaching 80 amps the box temperature was lower than the ASTA test results and therefore did not constitute any danger whatsoever to the PVC cables"?

A. The 80 amps that was put on in the ASTA test was a continuous current of 6 hours - 5h50 - we are dealing now with the case where factories are connected and that load of 80 amps. would not be applied on a continuous basic if one were to instal recording meters in each factory and analyse the charts, they would be subject, you will find, to a cyclic loading and therefore temperatures would not build up as in the test, it would be much lower.

Q. In actual practice we know that there were 3 consumers, with that number of consumers, we know that one of them had single-phase loads?

A. Agreed

Q. Would it be correct to say that the electric supply would be unbalanced?

A. There would only be little unbalance if the connections of the three consumers in question had been correctly connected; the object of the three-phase system where factories are involved, in fact, where single phase consumers are involved, is to reduce the neutral current to the lowest possible level that one can achieve.

Q. But if there had been inbalance this would have produced overloading in one phase?

A. I agree if there was inbalance.

Q. I myself said it, if there was unbalance, but you did not yourself test such an inbalance condition?

A. I have never carried out a test in these factories.

Q. Let us go back to the ASTA report - I am referring to Test 3. In your test at 150 amps we know that a fuse blew at 10.46. Could it stop at 10.42. I think it is obvious that if you had continued the test until 10.42 you would have reached a temperature of 191°C?

A. That is correct.

Q. If you had then reduced the current to say 120 amps would the fuse have blown?

A. Not necessarily but that is a question one would have to test to have reduced the current because then the heat produced would reduce.

Q. If you had done that the conductor would still have been exposed to 191°C.?

A. At what time?

Q. At the time that you reached 191°C and reduce?

A. That's right.

Q. It would have been exposed to 191°C.?

A. Yes.

MR MOOLLAN: The conductor or the connection.

MR DAVID: I said the conductor.

A. This is where 192° is reached at the top connector.

MR DAVID: And this could occur in any such surge of current lasting only 12 minutes this exposure to 191°C?

A. That is true, if the current was held at 150 amps or that period of time 12 minutes.

Q. We are going to your actual report and it is in respect of the short circuit calculation. The time current characteristic you have given in your report at p.3, does it show the pre-arcing time of the fuse. The whole question is the following: the time current characterstic you have given in your report shows the pre-arcing time of the fuse links and thus the rupturing time of 13mm seconds is the minimum time at 2350 amps because the arcing time of the fuse must be added?

A. I agree.

Q. In practice with limitation of the fault current by the fault itself the pre-arcing and total operating time of the fuse would be much longer and the fault at lower current maintained for a much longer time, would you agree?

A. If we have an interphase fault in the box that would produce in each phase a current of 2350 amps on this calculation and that is the current one would apply to 150 amps to give the time in which that fuse would blow.

Q. Would you have allowed for the resistance of the fault itself?

A. Where you get your resistance in the fault if we have an inter-phase condition.

Q. Although I should be asking the question, Mr Woodcock, I shall answer this one. Mr Turner will answer it through "personne interposee". The answer is the arc impedence of fault contact resistance.

A. I will accept there is some resistance in the arc contact if this were present.

Q. For which you would not have allowed?

A. I would not have allowed, it would not be appreciable.

COURT: You have calculated in terms of mm seconds. When you say not appreciable you mean something that cannot be measured in mm seconds?

A. I think learned counsel is trying to get at the fact that the time 13mm seconds will have to be a lengthy time 20-25-30 mm seconds. I don't know the figure he has in mind.

MR DAVID: We will not ask.

COURT: Are you saying that the heating of the fuse reduces the fusing capacity of the fuse wire?

A. It would reduce its time of operation, the temperature would rise in the fuse and this would reduce its time of operation.

COURT: The evidence we heard at the beginning of this case - I don't know whether you will agree - I think Mr Turner or somebody says the more the fuse heats and reaches melting point the resistance is higher.

A. There is a loss across the fuse with this increase of heat.

COURT: But the resistance is greater than it would have been initially.

A. This is correct. Mr Turner also said it was a function of I square T

COURT: With which you agree?

A. I agree.

MR DAVID: I am advised that what my expert says is the following: if a high resistance arc condition were established the current would be reduced. It would also be reduced by the existence of a phase to neutral arc fault via the box.

COURT: These are two separate questions.

MR DAVID: The first one is, if a higher resistance arc condition were established would you agree that the current would be reduced?

A. I do, but it depends on the degree of reduction in the current, it is not going to be reduced to a point where the fuse would not blow on an interphase condition.

Q. Would the current also be reduced by the existence of a phase to neutral arc fault via the box?

A. It would.

Q. I think yesterday you mentioned something about fuses of greater strength blowing before the smaller fuses?

A. I did. I have expanded on that this morning, My Lords.

Q. In the situation with the store and the consumers, in actual practice, let us call it, in the Bata situation, the major fuse was double the cross section of the minor fuse - twice one?

A. That is correct.

Q. The question is: would this not require considerable deterioration to cause the double cross section to blow first?

A. Electrically speaking that would be the case but I have said that when one twists wires together or it has been said that when one twists two strands together there could be damage to the wires, that is one case. I go back to the experience that I have had where, although it is the norm that a single should always blow first, I have personally known of cases where higher rated fuses on the semi-enclosed type have ruptured before the weaker fuses.

Q. Would age enter?

A. Not necessarily if damage had been caused to the twisting.

Q. Because in the present instance, of course, the double fuses were in position on the 28th June?

A. The first one was fitted, I think, some 8 days before the fire.

Q. It could not have been so badly deteriorated within that time unless of course it was running red hot?

A. I would tend to agree.

Q. In that case, if this happens, then, of course, this would be a condition likely to produce a fire?

A. If one had the load available on the three factories which is yet to be proved, of the current required to heat up to a red heat the two No.18, yes, I would agree.

Q. You have mentioned those circumstances in which you saw such fuses blowing - we are talking about the major and the minor ones - were both major and minor fuses of the rewirable type?

A. Yes, both fuses were of the rewirable type.

Q. What were their different sizes, if you remember?

A. If you look at my particulars I have been away from operation..... apparently for some 10 or 11 years, I find it difficult for people to go back to 6 years to remember what happened in the fire.

Q. That is why I said if you remember.

A. My Lords, I have put thousand fuses in but to remember one incident like this, if I had a memory like that I would be making much more money than I am making today.

Q. Let us go to the statement that you made yesterday about the cables which are in court, did you state, if I understand you rightly to have stated, that the temperature of the cables would be the same all along its length?

A. The current is the same and I would assume that the temperature is the same.

Q. Would you agree that the wire connecting the element of an electrical fire is hotter at the connection to the electric fire element than at the plug end?

A. Yes, I would agree, due to conduction of heat.

Q. In exactly the same way will not our cable be hotter at a bad joint which would be putting extra heat into the cable at that point?

A. If there were a bad joint, we are making the assumption, if again, if there were a bad joint heat would be generated at the joint, that I agree.

COURT: Perhaps as you are here, I think the witness said the other day that if there was overheating there would be overheating through overloading, it would have been throughout the wire of the cable, but, if there is a fault somewhere generating heat, then there would be locally more heat at one end than at the other.

A. I would agree. The condition is that the same current flew through the whole of that wire.

COURT: If there is overloading causing heat, then, the heating should be throughout the cable, but if it is through some faulty installation of some kind, then the end nearer the fault would be hotter or warmer than the other end.

A. I agree with that entirely.

MR DAVID: Would heat generatedby a fuse also provide extra heat to the cable?

A. Yes, that is proved in the ASTA test. The actual cable that was used on the incoming side of the ASTA test box actually took up the position of a heat sink, heat was draining from the fuse and at the contact into the cable.

Q. I am coming to the question of the cutting of the door, you point out in your evidence that a four amps arc would not cut through the door of the box and you consider arc cutting unlikely. What is your explanation for the state of that lid at that spot.

A. My explanation for the state of that box and its lid is that at the time of the fire, that box was affixed to the wall in an upright condition and that a fire had been started and the cable which is, you remember, My Lords, a PIOC with steel wire armouring around it served by an impregnated hessien jute circuit round the outside of the armouring. The fire adjacent to that cable would alight that cable, first the hessian would catch fire, that in turn would melt the lid which would then have the heat transferred to the insulation of the paper cable - it must be remembered that these paper cables are impregnated with oil - and once the papers have charred and burnt there would then be an interphase condition on the network, the copper conductors would all come together, there would be no insulation between them and this would then cause the high rupturing capacity fuses, the 160 amps fuses, on the transformer to rupture.

Q. So that the origin of the fire would be at the bottom of the cable?

A. Adjacent to the bottom of the cable or in that vicinity. You are asking me for my theory on the matter.

Q. This external source of fire would spread upwards?

A. Yes, that is normal.

Q. And the outgoing cable would be affected?

A. I am not a fire expert, I do not know and I would not know how rapid a fire can increase.

Q. Being given your theory would you not like to give an approximation?

A. No, My Lords, I am not qualified. If you would be kind enough to keep to distribution I would be happy to answer your questions.

Q. For such a thing to happen it would require a certain degree of knowledge of electricity?

A. Not necessarily.

COURT: To do what?

MR DAVID: Of setting fire to the bottom. If I understood Mr Woodcock rightly, someone would have to set fire to the bottom of the cable.

A. I am not suggesting when I propose my theory that he was attempting to burn the box. I am saying that if a fire were applied adjacent to that cable, that the cable would catch alight around the hessian jute circuit.

Q. In your theory how would the lid get on the floor at a distance of 4 ft from the box?

A. The lid, as we already know, is affixed by brass fixings on the hinges and two bolts that bolt the lid of the box to its main body are made of brass and this has a lower temperature at its melting point, much lower than the cast iron. I have said that I feel the box was affixed to the wall in an upright condition, the box itself when heated - and the theory had been advanced by one of your experts that the lid could be still balanced in that upright position. After a period of time of the heating of that box, it would detach itself due to expansion, and again, you will remember, My Lords, that it was affixed to the wall by steel rawl bolts, the lid and the copper of the cable on the incoming side would have melted but what has not melted are the steel rawl bolts; it is quite possible for the box once it has fallen off to describe an arc.

Q. This is how?

A. I am not theorising at the moment. I have come to the facts and am not theorising of how the fire actually started.

Q. I am interested in this lid, I am interested in the condition of this lid. You have explained how, according to you, the fire would have started, what would be the actual physical cause of this part of this lid being in that situation?

A. If the box was affixed to the wall in the order of 4 ft it would describe the arc. Would the lid be at 4 ft?

Q. No, no, what I mean is the part that was being cut off?

COURT: The missing part.

A. Oh, the missing part. I heard various theories of how this corner had been cut off. It first started with Mr. Turner's description, and

vivid it was, that there was an uncontrolled arcing condition in that box and eventually the arc localised itself on the one part of the lid and then proceeded to cut off the corner of the box. That, of course, would be called to be proved, that no such current could take place. We have now restricted the earth fault current to 4 amps and I still do not believe that 4 amps operating on that lid, a heavy cast iron lid, could possibly cut that corner of the box. I am willing, with Mr. Turner, to go to anyone in Mauritius even to an arc welder to get that lid cut.

Q. Have you an explanation?

A As I have said I do not know.

COURT: What would have melted this?

A. I don't think that it actually melted. I don't think the lid actually melted. Cast iron, as we know, is a very very non malleable metal, it is very very brittle. I have read in various reports that the lid was on the concrete floor. I am suggesting that when the lid came off and hit the floor due to its brittleness it fractured and broke away just that corner.

MR DAVID: Pieces should have been recovered.

A. It would be very very difficult, I feel, for that piece or pieces to have been found. They would have been subjected to quite a large degree of fire and we have picked up other pieces that have been sifted and they could well have been chucked away in the cleaning process.

COURT: You picked up some pieces of the lid?

A. Not pieces of the lid, My Lord, there was a lot of debris around, there was spalling from the beam, everything had been under intense heat and I am suggesting that people chat were sifting, did they, in fact, sift the whole of the contents of that room.

COURT: You are suggesting that when this lid fell to the ground it broke into two.

A. When it hit the concrete floor, yes.

COURT: So that the second bit which was missing would have been fairly large.

A. If the break was just one break, My Lords, that is correct.

MR DAVID: Would you agree that the heat of the fire by itself would not have melted up the lid?

A. It would not have melted up the lid no.

COURT: The witness said it did not melt.

A. I don't think the lid melted.

COURT: Will you look at the exhibit (shown to witness). It would seem that it is thinner at the spot where the piece is missing.

A. That is true. Once the lid was on the floor the fire would then have subjected itself to that broken portion and could have melted some of it, as we see it now, but I would suggest that when the lid hit the floor that portion fractured, this being cast iron.

MR DAVID: You will observe from the cables in court that each set of the 3 cables, you will confirm it, or otherwise, has been formed into a tight loop and bound with bare aluminium wire?

A. That I would agree, an example is at the further end

Q. If that is the way that it was installed in the store of Bata, what would be your opinion of such installation?

A. That it would be affixed on the outside of the Wall of Bata and it is quite a reasonable way of installing a temporary supply.

Q. And the wires would be suspending.

A. The wires are made up around an insulator attached to a DI and the DI is attached to a bolt in the wall and this is an approved method.

Q. And from there inside the premises and suspending down the wall from the ceiling with the bi-metallic connectors just loose, would you approve of such a method of hanging the cables?

A. I don't know in broad detail how the cables went from the room and then down into the box. I take it you are suggesting that they hung loosely, that I don't know. If that were so I would be glad to have seen them myself clamped in a much better way.

Q. To avoid any possibility of damage.

A. Yes I would agree.

Q. As a point of good practice or not good practice, in the circumstances of the fuse blowing, yorkshire or henley, would you personally have thought it essential to measure and record the currents on the downstream side of the henley box?

A. Yes, I would agree, it would be extremely good practice to have done this but the people that were sent to the site were only workmen, and,

in my opinion, there would have to be an engineer that should have been sent to the site to carry out the current test on the circuit.

Q. You mentioned yesterday in your evidence that everyday engineers or workmen are closing fuses on the live circuits?

A. That is correct.

Q. Would you not agree that although this would be quite acceptable on a small load current yet closure of a rewirable fuse on to a high short circuit current would be highly dangerous?

A. No, I would not agree. If that fuse were placed in that box correctly and all workmen are taught how to insert fuses into the holders there would be no danger. It is one quick action, there would be a bang, there would be a flash, but these are everyday occurrences. Today the open or semi-open type of fuse is going out of existence. Now we are going right over to a high rupturing capacity fuse in insulated boxes, the latest form being apoxy resin an insulated high standard box. It is only three months ago that I went to Oxford one of the main manufacturers in England and I saw these being made on the shaft and I saw the test procedures

Q. Have not your own experiments shown that jets of flames should have subjected the operator to burning or shock?

A. I take it that you are referring to the short circuit test. I would like to emphasize that a short circuit test was set up not to produce a fire technic display, it was produced and set up to try and smash the box. We wanted to rupture that box and to do this we pushed a greater current far in excess, in actual fact, twice the current, the maximum current, that could ever be achieved in the situation at Bata and in doing that we failed to rupture the box and all the sparks and flame was our making at the top of the box; it was produced by my colleague that bare conductors were affixed so that each of them touched that corner of the thread, lightly touched that corner, this is the specification test. When the circuit was closed on that short circuit, 150 amps flowed, and sparks and flame, as learned counsel is suggesting, were caused by the copper melting and being flown into the air as a shower of sparks and the photograph showed that the damage at the top was self-made, we actually knew that that was

going to occur, but the real object of the test was to shatter that box and we failed to do so.

Q. Would you not agree that it is advisable to check that a circuit is no longer faulty before inserting a rewirable fuse?

A. No, it is not always possible to check the circuit. Let us take the distribution engineering practice to 3 or 4 consumers. One is phased with a no light fault, the operator goes out on to the network, he goes to a certain position where he knows the consumer's concerned have reported losses of supply, he tests that box and he finds that one fuse has blown, it is not possible for this man to knock at 50 doors to find out if the fault has occurred in that premises. He had to test and then after reloading the carrier he would put in the fuse in the way I had demonstrated yesterday with my hand, the bottom contact is always firmly affixed to the lower holder.

Q. Now, if we look at photo 13939 short circuit (A) middle one, does it show that the arc has persisted and spread from the fuse links shattering the porcelain?

A. That is correct.

Q. If somebody's hand had been in that neighbourhood, it would have been dangerous?

A. I have already said we put on to this box a short circuit quite in excess of its rating current, this box for short circuit condition is rated at 4000 amps. We put 25% in excess of that.

Q. Let us go back finally to the henley unit itself, what is the correct way for closing the bolts of the lid, by using pliers?

A. I don't use what is used here. I would have used a bolt-spanner.

Q. Would you have used pliers?

A. I would have closed it with the pliers yes.

Q. If you were to use pliers would this lead to the damage of the lid of the box?

A. It would eventually lead to the damage of the lid if one persisted, but I have said it is the normal practice to use a bolt-spanner

Q. You have referred to the closing of the lid and you have said that by doing up one of the cover fixing bolts, the cover would be held in position?

A. Even if one bolt is attached that cover would be completely held in position. It is not

possible to split cast iron or to make it bend in any shape over that distance.

Q. Would you say that there was any play at the hinges?

A. There is a little play at the hinges, there could be.

Q. If a fuse carrier had not been, for some reason or another, properly fixed inside the unit, could this interfere with the closing of the lid?

A. The diagram that was handed in to court yesterday showed that there was a clearance between the fuse when correctly inserted and the inside of the lid. If I might make a point, if I could take you back a few days when Mr Davidson demonstrated the lid, I think, he made the suggestion that the fuses when correctly inserted were in contact with that lid. Please correct me.

COURT: He says so.

A. That was the first time in 40 years that I ever heard such a theory expounded.

MR DAVID: When Mr Davidson demonstrated were you in court?

A. I was in court.

Q. Did not Mr Davidson show how the lid would fir on to the carriers at that time?

A. I don't think it was. A rupee was put on one of the fuses.

Q. It did not close?

A. That is correct. We have done demonstration to show that in that box, similar to that one, we could put one line of Rs 3.00, you will see that it is just about possible to close the lid.

Q. If the fuse carrier had been properly fixed?

A. I would not expect a qualified workman of the CEB to leave a fuse that was not correctly seated in the premises, it would be gross negligence.

Q. Would you expect lead sheath and armouring not to be bonded?

A. Did I expect it not to be bonded. I did not expect it not to be bonded using two negatives.

Q. You did not expect it not to be bonded?

A. I did not expect it.

Q. Not to be bonded?

A. Not to be bonded, it should have been bonded?

Q. I don't want to at cross purposes with you Mr. Woodcock.

A. Thank you.

MR DAVID: My Lords, I think I have finished, but I would rather not close my cross-examination of this witness until after the recess.

COURT: Agreed.

R E C E S S

Friday 10th March, 1978

Bata Shoe Co. & Anor. v. The C.E.B.

AFTER RECESS:

Mr Moollan moves to re-examine Mr Woodcock (still under oath)

MR WOODCOCK: My Lords, may I make a statement. I understand this morning about a remark that I made to Mr David, this may have caused him some offence. If so I wish to offer my apology.

Re-examined

MR MOOLLAN: Mr Woodcock, this morning you have given the figure of 45 amps as being the rating for a single wire 18 SWG?

A. That is so.

Q. You said that you got the figure from the table, would you please say which table you were referring to to get the figure?

A. The table to which I referred has been obtained from the ITA regulations.

Q. You have also mentioned the figure of 75 and 80 amps when this question was put to you. Could you just give us an indication?

A. This is the 14th edition of the regulations for electrical equipment of loadings and on page 19 Table A(1)(N) concerning elements composed of plain or tinned copper for use in semi enclosed fuses and the rating of the fuse applicable to No.18 SWG is given here as 45 amps.

Q. I think it is agreed that if the rating is 45 the fuse will blow at double rate?

A. Yes.

Q. You have also mentioned those figures 75, 80. What did you have in mind when you were mentining 75 to 80 in relation to No.18 fuse wire?

A. That was the rating for 2/18 SWG wires twisted together. It is not I feel permissible to add 45 to 45. In the twisted condition it will be something else. This is an intelligent appreciation of the figure.

Q. It has to be less than twice the value?

A. Yes.

Q. You assessed it to 75 to 80?

A. Yes.

Q. Questions have been put and answered relating to short circuit leading to a fusing of a fuse wire and if I were to rewire on a short circuit the fuse will blow immediately. Is that always the case?

A. No, it will not be always the case, it will happen if the fault still persists; if the fault is clear it is known as transin(?), then it will be possible to fit in the fuse and that fuse will not blow.

Q. When an installation is being made from a three phase supply to a consumer and he will be installing single phase machines for lights; how would one normally expect the installation to be made in relation to the three phases

A. A load will be assessed and every endeavour will be taken to balance those loads over the three phases and as explained this morning to keep the current in the neutral conductor as low as possible.

Q. So the endeavour would be to balance the three phases by the installation?

A. That is correct.

Q. If you were informed that there was a trained technician who came to do the installation from overseas for that specific purpose; what would you expect that technician to do in relation to installing of single phase machines on a three phase supply?

A. I would expect him to divide, to connect the three to the three phases.

Q. In so far as the ASTA tests are concerned, do you believe that any appreciable difference is made in the test results producing anything to the temperature rise

test from the fact that a single rot of copper used in the EC2 condition was 14 streams per phase. Would that difference in the two installations make any appreciable difference in the test results which are shown and attached to the ASTA results?

A. No, it would not make any appreciable difference.

Q. In your view if anything, where would you find more heat generated in the single rod or in the opening strand?

A. It would be more heated when generated in the single solid conductor.

Q. What makes you say so?

A. Because the area of that solid conductor was much less than the two 7.064 fourteen strand condutor used in the test as installed in Mauritius.

Q. When you look at this wire (Ref.4A) it was the outgoing conductor from the henley box; we find that inside are two sets of 7 strands each one insulated in relation to the other by PVC; the whole of it sheathed inside the black sheath?

A. That is correct the seven strands being closed by red PVC sheath and black sheath; in the overall there is a PVC exterior.

Q. For any earth fault to occur in relation to this wire and the box what are the pieces which will have to be melted away?

A. The first exterior sheath and then the PVC sheath adjacent to the copper conductors. It has to melt the two.

Q. I have been given to understand from the evidence that the level of the fault of 2350 found in that box would be reduced by two processes; one, an arch and to this you have said yes. But it is going to be a small reduction. The other one fused by a neutral. In that second also what would be the level of that reduction?

A. It would be something of the same order as in the other case or may be less. I cannot say exactly.

Q. If it is 2350 which is the fault level and that can be reduced, the reduction would be small or slightly small?

A. It would be reduced to 2000 amps. or that order.

Q. You have said that the heat from the main source of heating is conducted away and dissipated and part of the apparatus will act

as a form of heat sink. Can that be seen from the ASTA test?

A. In the first test we would have to compare to the incoming terminals to the cable surface; we find that there is a variation in temperature between 79.7 at the incoming terminals and a surplus of 51.3; therefore heat is generated from the cable, incoming terminals into the paper cable and insulation.

Q. Can we take it then that moving away from the source of intense heat also necessarily brings along a lowering of the temperature?

A. That is correct.

Q. Whilst you are giving your suggestion as to the behaviour of the box in the fire leading to the state of the box, you mentioned that the source of the fire would be at the bottom of the box. What do you mean by the source of the fire in relation to that?

A. The source of the fire would be some distance, moving from the cable and the fire to be speeded to that cable and alighted there.

Q. It would be the source in relation to the cable as the source of initiation?

A. It must be somewhere to travel to the cable and this would ignite the hessien served.

Q. In your view to that hessien served to be set on fire, must there be actual contact between fire and hessien serving and could there be a space?

A. There could be a space and the heat of this would vaporised and eventually transmit gas.

Q. By radiation?

A. I know you do not have coal fire in Mauritius. We do have in England. There are many instances where the and the fire should not be too close the fire to catch the light.

Q. In a normal distribution organisation of electricity, would you expect the organisation to carry a test on these servings each time a fuse would blow?

A. No, I would not expect a test to be carried every time a fuse blows.

Q. You were present at the time the ASTA test was made and you have witnessed what you describe as a shower spark?

A. Yes.

Q. You have explained that this shower was molten copper. Would you describe what you saw, how those sparks behaved?

A. Just on the top of the box in the form of a small fountain there were incandescent lights at that time and before they have passed the level of the top. In the course of the journey the incandescent had gone and there was black smoke and in no way does the incandescent spark touched the floor in that state.

Q. You have also stated that there is a co-relation between the source of a fault and the source of heat in a line and the heat travelling up a certain distance along that conductor which is in contact with that source. If we take for example the henley fuse box and there was heat in that henley fuse box, would you expect that heat to travel all the way through the bimetallic conductiors on to the cable through two wires on to the further part of the cable which was outside the Bata building?

A. No, I would not expect the heat to travel that distance; it would have dissipated itself long before.

Q. If we look at test No.3, page 13 of the ASTA report, we find that at 150 amps. the fuse blew in 16 minutes?

A. That is correct.

Q. I see from the heading of the test that the test was carried out with 2/18 SWG fuse wire?

A. That is correct.

Q. I understood then that you were mentioning this and you stated at one moment that there were 3/18 fuse wire?

A. If I said that, then it was a mistake.

Q. The only test which was done with 3/18 single wires is to be found at pages 14, 15, 16 of the report?

A. That is correct.

Q. While dealing with the short circuit test attention was drawn to photos 13935 and 13936. We see three fuse carriers. On those fuse carriers there is one. This photograph is expected or intended to be the actual top and bottom of the terminals when it was inside the box?

A. That is so.

Q. What is on the top of the photograph is not the top in relation to the box and the base?

A. That is correct.

Cross-examined (continued)

MR DAVID (with the permission of the court)

Q. Mr Woodcock, to the first question put by my friend in re-examination, you referred to regulations which are set out in the 14th edition of the IEE. I just want you to say whether you confirm that there is a note at page 18 to table A(1) which relates to the size of fuse elements composed of tin copper wire. Is it the 14th edition, metric version?

A. On that page 18 I have got A9, A10.

Q. Do you mind to go to A1; is it the size of element composed of tin copper wire. The use of cartridge fuse to the appropriate British Standard is normally recommended but where a rewirable fuse is used the figures given in the above table will, in the absence of recommendation made by the maker of the fuse, provide an approximate guide to the size of the wire required. These figures represent the current which the fuse will carry continuously, the value at which the fuse will blow is approximately 2 minutes depending upon the type and construction of the fuse?

A. Yes, I have got it.

Q. In the case of an arch neutral, the base returns through a connection through the case, there will be the reistance of the joint and the path through the iron?

A. That is so.

Q. Do you not agree that this would considerably reduce the arch current?

A. Yes, I would agree it would reduce, but I would not agree considerably.

COURT: Would you give us the percentage or approximately?

A. I cannot.

No. 52

EVIDENCE OF JOHN SHARPLES

Sir Raymond calls and examines:

Mr John Sharples (sworn)

Q. Mr Sharples to go through all the introductory part of your report, but may I just request that you tell us that apart

from theoretical experience, you seem to have acquired considerable practical experience in the supply and distribution of electricity?

Curriculum vitae put in, marked "BC"
Report put in, marked "BD"

A. That is true My Lord, my academic training ended in 1934-35. Since that time I have been entirely engaged in practical application of my academic studies. That application has been until 1964 within the electric supply industry, first of all in the United Kingdom, then in Malaya and since 1964 I have been a consultant to a firm of chartered engineers and my experience with them has been in respect of electricity supply undertakings, operating in many distant parts of the world.

Q. I see in paragraph 1(3) that you have been entrusted with the responsibility to investigate on accidents which might be caused by electricity?

A. Yes, I would not like to put too much stress on this. I was not called frequently to investigage such accidents but it was necessary for me to know thoroughly all the legislation which was available and which governs and controls electricity supply in Malaya.

Q. As regards the second chapter of this report, the short circuit test we have suggested in order to simplify matters, we have suggested to my friend that my friend's expert and Mr Sharples should meet in order to try and see if they can agree on the interpretation of the result of short circuit test in the ASTA report. That we submit might save considerable amount of time and work on both sides and questioning about highly technical matters and if my friend accepts, I propose not to deal with chapter 2 to-day. If the experts agree on the meaning of the ASTA test, this would considerably simplify the task of everybody concerned. We can say that we are agreed on this and that.

MR DAVID: We are agreed to the proposition with the court's permission.

SIR RAYMOND: Chapter 3, the load potential and actual. You have finalised this problem in two parts. You have dealt in the first instance with what is called potential load and secondly, the actual load which according to information and statistics that we have been able to collect as actual has been stated; will you please explain to us what you mean by potential load?

MR SHARPLES: By potential load I mean the load which after studying the application for permission to collect load which the CEB receives from consumers, after studying that document we have to consider what load is likely to be imposed on the means of supply on that load. It will depend on the manner of operation of the consumer, the type of consumer, whether he is a domestic consumer, or a commercial consumer; whether it is for a factory, street lighting, offices, etc. It will depend on the hours of work in the office or factory. It will depend on the hours of employment of the persons occupying a household.

In every case the degree of load will be different to what the CEB may reasonably expect. This is because in your house you will not switch all the lights on at the same time; your wife is unlikely to be using her electric iron at the same time when she is using the cooker. Just a factory, it may or may not be on in day time, the factory may work only in the day, it may work in three shifts during the 24 hours.

The difference between the aggregate of the load installed in the factory and the load which may be reasonably expected to impose on the means of supply to service lines and the fuse box is known as diversity. It is measured by diversity factor. Diversity factor, however, the evaluation of diversity factor follows no fixed rules. It is determined and in fact it has been described in the IEE regulations, it is defined there as a guide to diversity and there is a footnote which explains that it really rests upon the system of the engineer or the person charged with responsibility for approving his application. Diversity exists within each installation. It also exists as between two or more installation. Your neighbour would go to the pictures tonight, you will stay at home; the television may be on. A third person may be overseas on holiday.

There is diversity not only in the home but also groups of homes, as between the homes. There will be diversity between factories producing different products, differences on the working hours. There will also be diversity going further and further back at each stage back to the power station. There would be diversity between industry and commerce; there will be diversity between the factories in the west of the country and

those in the east; but it is not necessary for us in this case to go any further than the two stages: the diversity within the factory and the diversity between the three factories which were supplied from the henley box.

Q. We see in the month of March the Southern Cross Diamond Co. applied for a load of 16.5 kwts?

A. Yes.

Q. It was given to them on the 21st March. On the 13th April Imprimerie Ideale applied for 28.5 kwts?

A. Yes.

Q. The 16.5 and 28.5 were within the capacity of this henley box?

A. Just making the simple arithmetic, the sum of these two we get a figure of 45 kwts which approximately is 60 amps per phase. Therefore at that stage there was no need to apply diversity.

Q. Then the Textile Industries, in the month of May applied for a load of 20 kwts?

A. Yes.

Q. The question of diversity arose?

A. It would indeed arise at that time; not only of that consumer. If he had not already done, the person responsible for approving his application would then have to divert his attention to the diversity of these two who had already been connected.

Q. Mr Davidson has given us his own diversity factors; he has reached figures which in the total are fairly similar to yours?

A. Yes, paragraph 3(10) refers to the diversity factors named by Mr Davidson in the course of his evidence and my own choice of diversity factors is given in paragraph 3(11). The result of application of those diversity factors is shown in table 3(17) and 3(18).

Q. You seem to have chosen a different way of arriving to the same result. You divide and he multiplies?

A. It is a matter of expression of the same thing. Mr Davidson multiplies by percentage of decimal, I divide by the reciprocal of that decimal.

Q. From your paragraph 10 and 3(11), as far as Southern Cross and Imprimerie Ideale are concerned, your choice of diversity is lower than that of Mr Davidson?

A. Yes, it is.

Q. But on the other hand your choice of diversity factor to Textile Industries is very much larger?

A. Yes, My Lord, it is.

Q. In the case of Textile you tell us that you have taken another factor into consideration?

A. It is that fact that leads I think to the considerable difference between my choice of diversity factor for Textile and that chosen by Mr Davidson. The other two Southern Cross Mr Davidson's figures and mine are different, Imprimerie Ideale he has chosen 1.67, mine is 1.25. In these cases I have nothing to go on but the statement in the application form that there were to be so many motors and so many lights.

In such a case one would probably turn to the IEE regulations for guidance. I have not got the particular table here, but I can see that one would consider the largest motor as certainly being in operation 100%. That is bound to occur. In the IEE you take 80% of the rated value of the next larger motor and 60% of the rated value of the remaining motors and by so doing I arrive at a value of 1.25 as a factor to apply.

I used the same process for Imprimerie Ideale. When I came to consider the Textile Industries, from previous visits I had to Mauritius, I had occasion to visit not only Textile Industries, but one or two other industries including Floreal Knitwear. This was in 1973. It was quite apparent at that time that the industry operated a multitude of smaller motors; they were arrayed in ranks of 10 sewing motors with operative seating for each. In each row perhaps one seal would be empty; the next seat may be occupied by a girl who is sewing the shirt on the machine, while doing this the machine is not moving. The next machine is moving. At the next machine the girl is moving the cap from one position to another. In the next machine having completed the cap she is turning round and putting it in the box.

My own personal observation was that at no time in a row of 6 did I see more than two machines working together, and in most cases there were not more than one machine moving on that day. This is what the factory operates. I then proceeded to the

ironing room where the completed shirts and other articles of clothing are pressed. The value at which the thermostat on the irons are set is dependent upon the material pressed. Nylon lower value and cotton higher value.

So out of the 50 irons you would not expect more than 20 or 30 perhaps to be actually switched on at one distance. All these apply to a diversity factor. Not content with that I went into the switch room where the CEB supply is brought into the factory. In that switch room are various meters; there is the main meter which is set on the particular tariff; there is the tariff for 311. There is a meter which records the maximum demand every half hour and leaves behind it; the recorder comes like that common arrow and leaves it. It shows the maximum level which at the end of each month the CEB would know the maximum demand of that factory during the preceding month. There is also a record of the number of kwts. The tariff charges are set in every KBA of the maximum demand plus so many cents, the number of kilowatts consumed. We have a measure of the actual demand for the month.

I can put in My Lord, a certified true copy of the recordings for the years from July 1972 until December 1975. I have included in my memorandum reference to these statistics for the year subsequent to January 1974.

Q. This is related to Textile. Would you please explain as you have done for that year, explain those figures for another year?

A. Textile Industries, from my own examination of the records, has been gradually consuming less electricity and I wanted to find the year when it was having more. I went to the records; unfortunately Mr Davidson could not have access to those records, I went to the records and from these I found that it was doing pretty well because during that year one would expect the diversity factor to be at its lowest value. So I picked from these for 1974. The time of the fire they were on a temporary supply and they were not on this tariff. It was impossible to find records to what happened. They were not given the new tariff until they had permanent supply.

In that room I saw also a meter indicating the current taken from by the combined parts an (a) meter. There was also an instrument which recorded the voltage; unfortunately there was no power at the meter,

but by multiplying the amperes by the square root of 3 and the voltage and by applying the power factor suggested by Mr Davidson, one can obtain the demand. At that time the instrument showed that the current was fluctuating between 180 and 200 amps and the voltage was 405 volts. Taking the higher figure of 200 and the voltage I got the KWA of 140, according to the latest information I could obtain from the CEB, the latest application form from the Textile is 17th August 1976, and on that day they authorised to increase the installed load to 475.4 kwts.

Application forms put in, marked "BE" and "BF" Total installed load in January 1974 put in, marked "BG"

In document "C" I have outlined -- on the photo copies -- the 12 months from January 1974. I have outlined them with black ink.

If I may revert to my visit; on the 13th February, I observed instantaneous loads of 140 KVA. I knew from the application form "A" that installed KVA was 740 and there I arrived at the diversity factory of 5. That was a very high factor. So I then proceeded to look at the records for the year 1974 and I found from document "B" that the installed load permitted in January 1974 was 403.23 kwts. Again I have outlined the relevant figure in the photo-copy. Looking at the records, in Doc.'C' I found that the highest recorded demand during the 12 months following January 1974 was 220 KVA. So far that year the diversity was 403 kwts converting to 630 KVA divided by 220, it gives me the diversity factor for the whole year, of 2.6, say 2.9; on the basis of my personal observation and of one year's known rating, I selected a factor of 3 and that I think was a process which Mr Davidson probably had not had the time, I repeat, to have access to the records. I am not casting any doubt whatsoever on his system, I am saying that I had access to the records which he had not.

Q. While we are on the subject of diversity factor. We have heard in Court that there is one particular motor of 10 HP at Imprimerie Ideale listed in his application and never been installed?

A. Yes.

Q. If that is so your diversity factor concerning Imprimerie Ideale would not show the real picture?

A. No, my diversity is based on the load,

potential load represented by the application. The application form does not say that the motor had not yet been installed; it merely asks for the installation in some time to come.

Q. The year the application was made?

A. It was reasonable to approve the application; they acted reasonably.

Q. Will you please tell us what is 3/11; it is distinct from what?

A. The CEB has series of tariffs, starting from domestic tariff there are commercial tariffs and industrial tariffs as well. The 211 tariff is known as maximum demand, it is calculated on the highest recorded kwts for the year plus a charge for the actual current used. That is for commercial premises. The industrial tariff commences with 310 and 311; they are parallel with the commercial one but at somewhat lower rate and 311 which is the one under reference is that this is a two part tariff whereby the tariff is measured.

Other tariffs 400, 500, they apply to classes of consumers with whom we are not concerned, for irrigation of the sugar cane fields, etc. The 311 tariffs is where the maximum demand is recorded monthly and it is used in these circumstances.

Q. The Southern Cross and Imprimerie Ideale were not on that tariff?

A. This was suitable for those who run their plants for a number of hours Otherwise it does not pay them toselect that tariff.

Q. Paragraph 3(17) please explain shortly the meaning of the two tables in 3(17) and 3(18)?

A. Dealing with the table at the end of paragraph 3(17), if for the time being one ignores the two right hand column, you will find that we started over with the kilowatts, in the second column this is the figure that they applied for. One has to convert kilowatts into KVA and for this purpose I have used the figures of Mr Davidson. I would probably have chosen figures which might be 10, 15% different, but it is not the point. I would take figures produced in the third column, the figures for KVA for each of these three installations and the simple calculation from KVA takes us into amperes.

We have spoken of the installations, diversity factor. These are found in the 6th column, 1.25 to 3. Applying those I then go to column installation after diversity, demand ADD which gives me the amperes which

the CEB might reasonably have expected to arrive in each of these three installations and which totals to 79.7; turning now to table in 3(18), I follow the same process for the first four columns and then use Mr Davidson's diversity factors to produce in the 6th column the ADD which had the CEB used Mr Davidson's figures, they would have arrived at. Mr Davidson arrives at 80 amps, whereas we have 79.7. However there is a slight misprint in the last but one column on the table page 6. Under the word 'group' should be the letters DF.

As I said there should be diversity. There is diversity between two or more factories. Again one must use a system in selecting. I have used the figure of 1.3, I have divided 79.7 by 1.3 to arrive at a figure of 61.3.

Turning to table in 3(18) I could find no reference in the memorandum of his application of any group diversity factor. I think he must agree that it could not have been less than one; he may not agree with my choice of 1.3. His choice may be between those two things in the table; I have used mine to give the henley box a 61.5 load which is the figure that any reasonable officer in the CEB would have arrived and would have concluded that it is carrying the capacity of the henley box. That is what I call the potential load.

Q. We come to actual load. Will you please explain as you have done for potential load how you arrive at the actual load; how you arrive at that figure?

A. In this case the exercise which follows in paragraph 3(18) and 3(23) could not of necessity be used before the authorisation of the application forms because it is looking back on what has occurred. By dividing the total number of kilowatts hours measured by the CEB on their meters, the dates of reading the meters vary, but they are broadly speaking covering the consumption during the four weeks starting early in June and finishing early in July. I have not pursued the present date because this is a very rough calculation and would not have calculated had the meter read be 28 days or 31 days.

For many reasons in the first column is the meter reading for the 12 months ending during the first week in July. In the third column, hours worked. I have used the figure suggested in evidence by Mr Davidson, 200 represent 25 days out of the preceding

months. We do not know precisely how many hours are worked by each. I divide the consumption by the hours worked, you obtain kilowatts. Applying again the power factors used, all assuming in the previous exercise, and we get an average level in amperes. Here we get a total of 51.4. Mr Davidson talked about this method of determination of average load, but he did not carry there to any conclusion. So I cannot make any comparison with his memorandum.

I then proceeded according to my own loads in paragraph 3(22), the average must be an average between a high and a low. During that month it is probable that during some hours on some day the load of each factory would have been higher than the average; on other days it would have been lower. I have nothing to guide me but I have assumed a figure, 3(22) is clear. I have applied this diversity factor of 1.3 to bring me to 39.5 Paragraph 3(25); this defines the average between the high and the low and I have assumed that the maximum would be 15% higher than the average.

I think this is probably the figure during that month because we now know and we can use this, we know that certain plant particularly in Ideal Printing is not even installed and the same applied to certain machineries in Textile Industries, only from evidence given and from records is it known that Southern Cross Diamond was working to full capacity and I believe that the figure of 45.4 amperes would reflect more accurately the maximum demand of those three industries at the time of the fire than the potential demand approved by the CEB of 61.3.

Q. Would we pass on to paragraph 3(26); we are referring to the ASTA test and to the ERA test. I believe that both come to the same conclusion?

A. I have not got my copy of the ASTA report. My recollection is that it is so. The ASTA test reported is test 1 on sheet 8 on ASTA, document A of the records, I adjust temperature at No.5 of 79.7 degrees centigrade. We have not precisely comparable figure in the ERA report but we did have a test with 2/18 SWG on page 4 at 90 amps. for 100 minutes where the maximum temperature at a comparable figure to that recorded in the ASTA is 56 degrees plus the ambient temperature of 50 degrees. We cannot dispute the appreciation of two reports by independent but reputable concerns. Those temperatures are not dangerous temperatures, not of such an order to have

softening or melting or flowing of PVC.

Q. What would give the figure at which they would start?

A. We do not dispute the figure put forward by the plaintiff, that at 120 degrees the PVC would begin to soften and at 150 I think plaintiff's expert said 160 degrees, the PVC would commence to flow but our figure is 180 and there is no danger to be caused, no deterioration of the PVC.

Q. May I ask you to explain to the court the behaviour of the PVC under heat. When you say PVC will start flowing, what is that exactly?

At this stage the witness demonstrates to the court how the PVC would be set to fire (with the help of a candle which is lighted)

A. A source of heat was applied to the black insulation from that circular cable which had been removed and the source of heat was allowed to continue causing melting and flowing on the icicles which solidified as it extended, it drops; all this material would flow, had flame continued to be applied here this would have burned. I doubt whether that burning would have been sustained without further application on the flames. This is the flowing, it is not like a tap tapering where it becomes detached. It flows downwards.

PVC put in, exhibit 11

Q. It would be a sort of paste flowing?

A. I would describe it as icicles in the formation.

Q. Could I call it a stalactite?

A. Anything dropping down would solidify down, as a candle when burning solidifies when falling down. It is not spread as a pool. These are purely personal opinions. I do not claim any authority for this.

Q. It would not splash?

A. It would not splash.

Q. Paragraph 3(26) c or b. You say it would flow?

A. I think we should go back to 3(26) b. We would not dispute the figure 120 degrees at the point where the PVC starts to deteriorate. My own information is that it begins to soften at a lower figure, something over 100 degrees. Soften but not flow. That is why the figure of 100 amps. produces a figure lower than 120 degrees. In (c) I am

referring back to the table in paragraph 18(b) of 80 amps and 79 showed in Mr Davidson's memorandum. I think the process of rounding it was there. Allowing Mr Davidson may have chosen the group diversity factor of 1 instead of my figure of 1.3 we have the figure of 79 amps. and in order to exceed 100, Mr Davidson in his calculation added a figure of 46 amps. This is perhaps to have the continuous heat fault current which might arise from a fault and the earth represented by the iron work of the box.

We have since shown that Mr Davidson's assessment of the earth loop at 5 ohms was in fact very much too low. The test made by Mr Woodcock which are not disputed by the plaintiff showed that that figure of 56 amps should end by the figure 3.77 amps. If we add 3.77 to 79.7 we get the figure of 83 amps.

We now have a choice. Mr Davidson's 79 plus 4 or my figure of 61.3, again we add the 4 and we find these figures generate excessive heating in the box or its cables attached.

Q. If we accept Mr Davidson's figure that will take you to 83 which would have nothing like the temperature which you have cited at which the PVC would start softening, let alone flowing?

A. Indeed that is so.

Q. I would like you to make it quite plain. When you talk of a fault to earth of 4 amps. are you referring to a fault on Mr Davidson's assumption that there may be a fault?

A. I do not agree that there was any such fault. It has been given in evidence by Mr Turner that if a fault occurs where the up going conductors from the box pass through the holes, if through overload the PVC had melted and flowed; if there had been a lateral force applied to the internal conductors, if that force had pressed the copper wires through the PVC until it came in contact with the box; if all those things occur then an arch, low current arch, would develop. That is the only thing, if all those factors occur certainly an arch occur. The current in that arch would be 3.77 amps.

Q. In other words, it presupposes the existing of four ifs?

A. I did not count them.

Q. This calculation is based on conditions which are the worst possible that you can imagine?

A. The worst possible that I can imagine, that I can deduce from the calculation of the plaintiff's experts. If the current was 79 amps. that is to say, if no group diversity was applied, if you have the overload, if you have the melting, if you have the lateral force, with all the ifs, then you could get a persisting leakage of 77 amps, and that is to be added to the regional 79 amps.

Q. You reach the figure not at all dangerous?

A. But those of the ERA show no possibility of causing any form of trouble with the PVC either softening, or melting or flowing.

Q. Your calculated figure and your estimated diversity factor lead you not to 83 but to what?

A. To 61.3.

Q. The 83 is the figure of Mr Davidson without applying the diversity factor at all plus the ifs?

A. Yes, this figure of 61.3; I admit it is 1.3 amp above the rating of the box and in paragraph 3(27) it has been computed.

Q. The capacity of the box is much in excess of the rated figure?

A. There is a very large figure margin of safety built in the box.

Q. Would you say that it was not only the capacity of the box, but the capacity of every single one of the elements of the box which would have been put to test before the box would pass the safety point?

A. I have no reference to quote; undoubtedly this box produced by henley long before it is merged in the GEC; it has been producing for years and it is undoubtedly producing the British Standard specification. BSS are well known for their concerted nature and components of that box including the fuse carrier, the fuse base, the terminals and everything would have been done to British standard and that in itself is a guarantee of its resistence.

At this stage the case is adjourned to Monday 13th March, 1978, for continuation.

IN THE SUPREME COURT OF MAURITIUS

ON MONDAY, the 13th day of MARCH, 1978, at 10.30 a.m.

Before the Honourable M.RAULT, Acting Chief Justice
the Honourable P. de RAVEL, Puisne Judge

In the Supreme Court

Defendants' Evidence

No.52
John Sharples

Examination (continued)

13th March 1978

SIR RAYMOND HEIN resumes the examination of:

MR JOHN SHARPLES (sworn)

Q. If your Lordships are agreeable, perhaps we might start with chapter 2 by asking Mr Sharples about some minor alterations in his report (Document AD) which he has agreed with Mr Turner. W would fortunately not have any dispute about this part of the report.

COURT: Agreed.

Q. Mr Sharples, will you please state the paragraphs on which you have agreed with Mr Turner?

A. My Lords, Mr Turner and I discussed the oscillagram shown in the ASTA report, marked B, reference No.157602. These diagrams, to the layman, are probably meaningless, to myself, they are written in code and I would normally have to have the code book in order to interpret them, but to Mr Turner, they are almost his bread and butter and he has the code in his head. With Mr Turner's assistance, we discussed these paragraphs this morning and with relation to paras 2.9, 2.10 and 2.11 which are the paragraphs of most significance to my conclusions, we are agreed that subject to some minor modifications of wording.....

COURT: Sorry to interrupt, which report?

A. My memorandum.

COURT: Which chapter please?

A. Chapter 2 on page 2. The first paragraph is 2.9 on which we agree there are minor modifications in the wording - half way down that paragraph are the words "cloud of copper vapour" we would add after the word "vapour" the words "and arc plasma".

COURT: What is an arc plasma please?

A. It is the consequence of an arc burning through air, its ionization of the air and some of the other phenomena which occur is the main cause of an arc continuing to burn over a fairly appreciable distance. I notice the nod

from Mr Turner, My Lords, that means that he agrees with me. Two lines further down after the words "experts" insert "but at a much lower current". In the same line after the words "to the disintegration" insert the words "to the cutting or disintegration". In the next paragraph, the first line of para 2.10 after the word "duration" insert the words "of arcing" and finally in para. 2.11 you will see the words "not burning" in parenthesis, included in those parenthesis we would like added a semi colon after the word "burning" "we would not have expected it to burn since it is in intimate contact with the cast iron lid." I would make it clear that we did not discuss para. 2.12 which are purely my conclusions.

Q. Mr Sharples you have simplied our task of course, but could you help us by going shortly through the other paragraphs. I am referring particularly to paragraph 2.4 of your memo. When you say: "The purpose of the ASTA test was purely objectively namely to discover how the henley box would react to the imposition of a short circuit greatly in excess of that for which it was designated", what was the amperage that you applied to that box?

A. The amperage applied to this box was 5000 amperes in each phase that was known as a three-phase symetrical short circuit. The box is designed to clear successfully a fault current of 4000 amperes and by reference to photograph 13952 in the other ASTA report, the temperature rise report (A) Your Lordships will observe on that label stuck to the side of the box on the left hand side are the words "short circuit 4000 amperes". We submitted the box to a test of 5000 amperes which was 25% in excess of the rating of the box and indeed more than double the actual potential short circuit current of 2350 amps which my colleague, Mr Woodcock, mentioned in his testimony. The whole purpose of this test was to endeavour to destroy the box and/or its contents and see at what point this occurred. We did not succeed in doing any irreparable damage. By this, I mean that the cast iron of the box itself remained in as new condition, the cermic fuse base, particularly the one illustrated in photograph 13934 - we are now back to the short circuit test - clearly showed that the middle fuse base suffered some damage and in photograph 13935 on the next page, you will observe that the carrier which fitted in to

that fuse base also suffered fragmentation of its lower area, I would repeat, My Lords, on that photograph, the bottom of the fuse carrier as shown on the top. All that damage could have been repaired by the removal of the fuse base, the insertion of a new fuse carrier and the general cleaning up and that box could have gone back into service. That is what I mean by "no irreparable damage", it did not burst the box, it did not throw the door of the lid. Having done that we were satisfied that such a condition could not have occurred in the Bata warehouse.

Q. You state in your paragraph 2.7 "that at the instant of application of the short circuit a flash accompanied by a small eruption of sparks occurred at the point of contact between the bare outgoing conductors and the holes in the top plate". The damage done to the top plate is shown in photograph 13937. We see, on the lefthand side of the holes in the top plate, some signs of burning on the part of the top plate, that is the result of what?

A. That burning and deposit of molten copper is the result of the arcing which developed when the short circuit was applied because of the light contact which we had established between - for this purpose of this test - bare conductors and the top plate. This arcing at this point, My Lords, is external to the box and is not related to the arcing which subsequently developed within the box which is discussed in para. 9 onwards of my memo.

Q. It does not mean that the top plate was irreparably damaged or damaged?

A. No, My Lords, most this damage is, in fact, the deposit of copper on to the cast iron of the top plate and although, in particular, the second from the lefthand conductor appears to have eaten in to the cast iron, this is an optical illusion, it is the cast iron which has remained and the bite is into the copper almost in fact severing it. There were signs of arc roots in those holes at the point of contact, a little burning, but as far as cast iron was concerned, this was negligible, the main damage suffered by the copper conductors which, of course, melted at a much lower temperature.

Q. What are the dark shadows that we can see round the molten copper?

A. Largely suit (sic) and the discoloration of the green paint of the box. It would be observed that this discoloration radiated particularly noticeable on the righthand to conductors, the

black mark to the top right of the second hole from the left is probably suit.

Q. You told us that you also observed a small eruption of sparks. Will you please explain what exactly was the performance of that eruption of sparks, if possible, the length of the arc. When I mean arc, I mean the arc described by the little pieces of copper being ejected?

A. My Lords, these sparks are in fact small globules of molten copper.

COURT: That is what you say in para. 2.8.

A. Yes. They described a small fountain. Perhaps if one likens it to the sparkler which children use, of magnesium, I think the little thing they hold in their hands and you get a little flare of showers of sparks from that. It is an exaggeration of the impression because no child who had a sparkler which lasted only for a fraction of a second would be happy, but if you can thus imagine this lasting for a fraction of a second, that was a sort of small fountain of sparks, they, of course, proceeded upwards from the plate at the instant of the striking of the arc, they transcribed an umbrella shape like that, and in falling, they ceased to be luminous before they passed the level of the box. If one looks at the first photograph 13932, one sees the box in position and the sparks would go upwards perhaps half the length of the supporting column there, come across and start to drop. My observation was that before they had fallen again to the level of the top plate they were no longer visible, they had become dark, cooled below the temperature incandescence and would continue cooling as they fell to the ground. It is perhaps rather dramatic to describe it as anything other than a small eruption, it was not a fountain. It is very difficult, My Lords, to choose words which don't give the impression which I am trying to give out, otherwise it gives the opposite impression. They were sparks but they were invisible before they passed the level at which they had started.

Q. They became invisible that is to say about the time you said they reached the level of the top plate of the box they had ceased to be incandescent?

A. Yes.

Q. Does that mean that they had lost a good deal of their heat?

A. Yes, because copper is not only a good

conductor of electricity, it is a good conductor of heat, and the conducting of heat from the centre of the globule to its periphery is rapid, it is at the periphery that it radiates its heat to the atmosphere, so the cooling of a globule of molten copper is very very fast.

Q. By the time these little globules would reach the floor, something like 4 feet lower, would they have lost again a good deal of their heat?

A. Just as a child's sparkler does no damage to the child's hand, I would say that if one had placed one's hand on the floor below this box one would not have felt any burning. A child's sparkler may occasionally burn a little hole in his nylon shirt but won't set fire to the shirt but I have known occasions when a spark had done that. I don't think any damage would have been suffered if you had your hand on the ground at that part.

Q. Supposing I have some inflammable substance in my hand holding it at 4 ft from the top part of the box, would you expect it to burst into flame?

A. It will have to be very highly inflammable. I know that one can drop a cigarette end into a pool of petrol and the cigarette goes out. On the other hand, if you hold a cigarette at the mouth of the filling hole of your cast tank and you have exactly the right mixture of petrol, vapour and air, you could cause a dramatic explosion. If you had the entrance to your motor car petrol tank level at the top of this box then I had little doubt that you could have an explosion from one of the sparks, but had you had a basin of petrol on the floor, I very much doubt whether anything would occur at all.

Q. In that case it could be the vapour from the petrol?

A. It would have to be something highly inflammable of the nature of petrol, vapour or other gases.

Q. Let us assume that instead of holding my hand some feet below the top of the box we had some cardboard, something like this, or a sheet of plastic, or a sheet of rubber, from which soles are made for shoes, could they possibly catch fire?

A. No, they could not catch fire. You might get a little tiny spot on the cardboard such as a slight burning, as I mentioned on the part of the nylon shirt, but no congregation, no lighting of any moderately inflammable substance.

Q. In para.2.9 you mentioned the striking of a small arc from one of the phases, probably the yellow one, to earth, I take that to mean to the lid, will you please look at photograph 13933?

A. Yes, I do not refer to it as a small arc, it was an inter phase arc which, by its very nature, was a pretty substantial one and arcs travel along the most unpredictable courses, one offshoot of this arc undoubtedly struck the door and left the marks which are clearly visible in photograph 13933, and this would be an arc to earth at that point.

Q. You mentioned a small arc, a short arc, from apparently the yellow phase to that part of the lid which was nearest to the white dots beneath the paper.

A. Those white dots are largely molten copper, again copper globules which had struck and stuck to the door at that point. There was a small amount of burning of the cast iron at those points and that is damaged which is absolutely negligible, it could be removed with a piece of henley paper quite easily.

Q. Is this all the damage that it did to the lid?

A. That is all the damage that it did to the lid.

Q. Or for that matter to the box?

A. Or for that matter to the cast iron box.

Q. You attribute this to the large clearance between phases together withthe asbestos interphase separations and the larger clearance between live parts and the earth box which contributed to self extinction of the arc?

A. My Lords, Mr Turner and myself are agreed that the arc which followed the blowing of the fuse lasted for cycles or different cycles current which is 8/100th of a second and then self extinguish. It could be of earth, we were lucky, in this case, perhaps the arc could have run away in the manner in which some of the plaintiff's witnesses have alleged as possible. The fact remains that in this box it did not run away, the box, its overall dimension, the internal spacing between the various components are generously designed and contribute to the self extinction of the arc. Had that arc persisted, however, My Lords, after a further one-tenth of a second the master circuit breaker in the test laboratories would have operated and cut

it off, the master circuit breaker in that instance would have been duplicating or imitating the role which on site would have been performed by the HRC fuses. The mast circuit breaker in the laboratory was to prevent some accident happening in the box and blowing the thing to pieces. If the arc had gone up by itself the HRC fuses at the Bata Warehouses were there to guard against such thing happening at that point.

Q. Mr. Woodcock had established that they would have blown in something like 13 milliseconds?

A. Yes.

COURT: Did you say how many hundredths of a second the arcing seen in the ASTA test lasted?

A. 8/100th

COURT: If it was a question of milliseconds how many that would be?

A. That would be 80 milliseconds.

COURT: That is in 13 milliseconds it would have cut that arcing?

A. It would have cut off earlier. The circuit breaker in the test laboratories was set to a predetermined time, it was not operated by the current which was passing, it was a predetermined cut off.

COURT: It was a time factor?

A. Yes it was a time factor, a total of two-tenth of a second from the start of the experiment to its operating.

SIR RAYMOND: Mr Sharples, have you got in your possession a copy of the design of the manufacturer.

A. I have not got a copy because the only one I have was handed in to court.

Q. You have mentioned the clearance as regards a phase to phase fault, will you please show them on the design?

A. The clearance within the box as regards a phase to phase fault an arc would be nearest that I can say is between - may I mark this drawing, My Lords, so that it may be passed up to Your Lordships and you will see what I am indicating.

COURT: Yes.

A. Between that, I mark the distance A which is 1½ perhaps 1¾ inch between the bottom terminals of the lefthand fuse bases. In the centre

course near the elevation of this box the nearest distance from any phase to earth is again from that terminal to a point on the box itself just below where the door closes, I mark that B, and it is a little over one inch. Having said that this picture represents a box slightly different in the terminal arrangements to those which were in service in these lower terminals and did not exist on the distance which rarely relate to these upper terminals here, but in fact, they are so similar, that they have no bearing - for ease of reference, I think, these markings indicate clearance. I would like to repeat, My Lords, that arcs lit extraordinary distances and once they are struck they will quite often remain, continue to arc over surprisingly large lengths but these clearances contribute, I could put it no further than that, they contribute to the self-extinction of the arc, they are a contributing factor.

Q. But in your test we find that the arc extinguished itself?

A. The arc extinguished itself in our test, it was not pre-arranged with any arcing at all, it was a bonus.....

Q. Now, if you will look at the side view of the box you can see the clearance between the fuse carrier and the lid?

A. Yes.

Q. Which, I understand, the full scale design is between one-half inch?

A. I would have said perhaps $\frac{3}{8}$ of an inch, a little less than $\frac{1}{2}$ an inch, it happens to be of the thickness of Rs. 3.00.

Q. Is the door meant to press the carrier into position or to hold it into position?

A. No, that is not the purpose of the door. The purpose of the door is to complete the boxing in of the fusible elements and the carrier within the box. When a box is subjected to very heavy short circuit it is conceivable that the electro-magnetic forces set up in the box could force the carriers out of the fuse base and throw them some distance if there were no door; the door is there to prevent them from being projected from the box. It is not a substitute for the diligence of the electrician who replaces the fuse; he would normally be trying to push those carriers open, they would remain open without any assistance from the door.

Q. You have heard submitted that the object of the door was to keep the carrier into position or to push it into position?

A. I have never heard the theory that a door was designed to push the carriers into position.

Q. When we left we had reached para.3.27 of page 9 of your memo?

A. Yes.

Q. Since the last sitting you have added para.3 28 to your memo and in your para. 3.28 you deal with the connection that was made to Textile Industries on the 1st June. So on the 1st of June the box was fused with 3 single 18 SWG fuse wire?

A. Yes.

Q. Would you say that the box was under or over-fused?

A. On the 1st of June when Textile was connected the load on the henley box that might be anticipated from such connection added to the loads of Imprimerie Ideale and Southern Cross which were already connected, the potential load would rise above 45 amps. which is the rating of one 18 SWG fuse wire. Therefore the box from that date could be regarded as being under fused. The potential load was shown in my para. 3.17 as being 61.3 amps. which is in excess of45 amps.

Q. What would be the result to the fuses of the fact that they were not strong enough to withstand the potential load?

A. The rewirable fuse as we have heard would normally blow in a short time, a matter of perhaps a few seconds, may be 2 or 3 minutes at a figure of amperes double its rating. In between the rated value of 45 amperes for one times 18 and some 85 or 90 amps which will be its blowing value a currency in between those values the fuse tends to overheat and then cool off and then overheat again as the load comes on and off; each time it does this there is a degree of oxidation of the fuse wire, it loses a little of its cross section and the next time the load comes on it will heat up a little more and progressively the fuses deteriorate - I have used the term "fatigue" or gets "groggy", - so in the end it would blow at a figure appreciably less than the 90 amps which was its blowing rating time when..... condition.

Q. You mentioned 45 amps. Mr Davidson has chosen to refer to the manufacturer's data as shown in the specification attached to this henley box and to double it so that it reaches 102 at its blowing value indicated by the manufacturers. When you state that the rating of the fusing of a 18 SWG fuse is 45 you rely on what?

A. I was relying on tables which we referred on Friday, Table A1 in the 14th Edition of the Institution of Electrical Engineers Regulations for the Electrical Equipment of Building.

Q. That was the very edition that my friend referred to in examination the other day?

A. I believe so.

Q. That was the part that Mr. Woodcock was referring to in his evidence when he told the court that it was 45 and a factor of two we put it at 90?

A. Exactly, Mr. Woodcock in fact was referring to another set of tables published by a manufacturer but which acknowledge their source as being this stock.

Q. My friend called Mr. Woodcock's attention to the fact that there was a footnote?

A. Yes.

Q. The footnote, if I understand him rightly, only says what Mr. Woodcock has already stated, namely, that it was an approximate figure and not an absolute figure?

A. Correct.

Q. But nothing in this book indicates that it is 50 amps?

A. For a single 18 no. The table clearly says 45 amps.

Q. My Lords, I put in a copy of this page including the footnote referred to.

COURT: Are you putting in the book or the photocopies?

A. My Lords, if it is possible for me to have the book back because I would wish later to quote other passages from it.

PHOTOCOPIES PUT IN AND MARKED

SIR RAYMOND: What is the object of these regulations, Mr Sharples?

A. These regulations were prepared by the Institution of Electrical Engineers which is the professional body to which all qualified engineers academically qualified engineers, may belong, and, as a rule, in

Great Britain, do belong. The first edition of these regulations was published under other different titles as the Rules and Regulations for the prevention of fire risks arising from electric lighting issued in 1882. If Your Lordships will allow me I will read a few extracts from the Introduction:

> These regulations are designed to ensure safety especially from fire and shock in the utilization of electricity in and about buildings.
>
> They relate principally to requirements for installation, inspection, testing and maintenance of consumers' installation.
>
> The regulations are not intended to provide for every circumstance; those of a difficult or special character will require the advice of a professionally qualified electrical engineer.

They go on to describe the effect of the regulations;

> The Institution Regulations are intended to be cited in their entirety for contractual purposes and in Great Britain to supplement the statutory provisions. Failure to comply in a consumer's installation in Great Britain with the requirements of Part I would place the supply undertaking in the position of not being compelled to commence or in certain circumstances to continue to give a supply of energy to that installation.

The whole emphasis is that these regulations apply to the consumer's installation.

Q. Not to the supply?

A. Not to the supply authority.

Q. Does it affect, as you already said, the rating of the fuse.

A. There are certain facts of physics which apply, whether they are in the consumer's premises, whether they are on the supply authority, these fuse tables would so apply.

Q. Referring again to your para. 3.28 I see that you noted that between the 28th June and the 5th July each of the three fatigued single 18 SWG fuse wire blew in turn. What are the conclusions, in your view, should be drawn from these facts?

A. The fact that each of the three fuses blew in turn and not the same one repeatedly blew

indicates that the degree of fatigue in each of the three fuses was similar and I would deduce from that that the loads were approximately balanced as between the three phases.

COURT: Had not the first one been double on the 28th?

A. Yes, Had it only been that phase which was underfused then nothing..... would happen but a day or two later a second one showed signs of distress, so there must have been almost equal load on the second one. The doubling of the fuse wire does not transfer any load from one phase to the other.

COURT: You said the same one blew again and again, they put an end to it, it would not blow again.

A. They don't put an end to the situation whereby a few days later the second one blew meaning that the load on the second was probably the same as on the first. My other deduction in order to blow a single 18 is that there must have been loads even in its fatigue state of something perhaps 10-15% less than the 82 or 100 amps, in otherwords, although I have shown in my table of 3.17 that the prospective load was 61 amperes, that, by itself, would not have been sufficient to blow even a fatigue single 18.

SIR RAYMOND: So, in your following paragraph 3.28(d) we can see the reasons why the one 18 fuse may have blown?

A. Yes. The table in para. 3.17 was the prospective load after diversity which would be used by the supply authority for determining the capacity of the service given to these premises: the overhead lines, the fuse box, the fuses. It does not take account of short term excess loads which would not cause damage to the service facilities and by the short term loads I would include the loads of a welder which might persist for a few seconds, perhaps 10-15-20 seconds, nor the excess loads on the starting up of a motor which would persist for a very much longer time, perhaps 5, even 10 times the value of full load current of the motor, but that would attenuate extremely rapidly, falling to normal lower rating into a few seconds. If these occur on top of your 61 amps or after diversity demand you would for a very brief period add something of the order perhaps of 40 amps to the current going through the fuses and you would add it perhaps

for special time to cause that fuse to blow, you then return, replace the fuse. That particular coincidence may not occur again for several more days but probably will occur and back you go to the fuse again. I believe that is what was happening during this period.

Q. Now that you have mentioned the welder, perhaps we could deal with a reference that Mr Davidson has made in his report page 8, which says that "motor starting loads can vary from between 5 to 10 times the full load current. In the case of the compressor" - this one which you are referring to - with the full load current of 156 amps - he suggests there may have been - would these motors be provided with some sort of a device to prevent the jumping up 10 times the full load?

COURT: Would you know the answer to that question without having seen the machine?

A. I could not give a positive answer, My Lords, unless I have seen the machine, but I would expect any person who sold a compressor driven by a motor as a single unit to embody in that unit a proper start for the motor. If, on the other hand, one bought a compressor and then perhaps had it driven by petrol engine and then went out and bought a motor and put the two together, you probably would not have a start, because a compressor by its very nature requires the motor to start against full load, it would like trying a car in top gear. The start is the gear box and it is almost certain that any manufacturer making a compressor unit would embody a proper start but in this instance I could just not say whether there was one or there was not.

SIR RAYMOND: I would like to state to Your Lordships that the compressor in question could not be examined because the company which owned it went bankrupt and ceased its operation. Mr Sharples you referred to certain terms which I should be grateful if you would define. You have told us of momentary peak loads, what is it?

A. I think perhaps one can start from the other end one starts with a maximum load which would be the normal maximum load after diversity demand which I have reached in my para.3.17 that is the maximum demand which one might expect to occur during the working hours of a factory on shift something between 8 in the morning and 12 noon and again between one o'clock and 4 o'clock in the

afternoon. You then have the next stage which is cyclic loading which is a repetition of this load going on through the day. It is not running at its maximum after diversity demand through the 4 hours, it would be rising and falling from time to time, and then you have the momentary peak demands which occur, as I have just described in association with starting certain motors and other appliances which have very short term loading. The after diversity demand determines a capacity of the service facilities. The cyclic variation in demand will cause certain factors such as the heating and cooling of conductors which may, in certain circumstances affect their performance. The very short term loads have little effect on appliances other than such appliances as fuses which were designed to operate within seconds, if those demands are too great, that is, the purpose of the fuse is to protect the appliances against momentary loads which persist far longer than moments.

Q. But in your opinion there would be no negligence for fusing the box with 18 gauge wire?

A. Not at all.

Q. Which, as you have also explained, being given that the box was under-fused something would probably blow beneath their fusing value of 90 amps if anything?

A. Yes.

Q. This occasional blowing of one of these fuses is something to be expected?

A. It would be expected.

Q. You have referred to momentary overload and you have said that that current endures in this instance, it is a momentary overload and so the time is extremely short and in consequence the heating effect is very small compared with the heating effect of the permanent current after diversity current.

Q. We shall pass to chapter 4. Would you say therefore that the momentary rise would not affect, would not constitute overheating, it must be continuous over a period before it starts affecting?

COURT: This is not what the witness says, he merely repeats the formula I^2T many times.

SIR RAYMOND: Thank you, My Lords, Mr Sharples, let us pass to chapter 4. You are dealing with the arcing theories put forward by the

plaintiff, would you like to explain how you understand these theories to have been put forward?

A. My Lords, there are 3 types of arcing, or, I should say, 4 types of arcing which we might contemplate as occurring in this box. There is the arcing which might arise between the phases within the box, between the fuse carriers such as that which indeed occurred in our test, that would be an interphase arc of very substantial current - 1000 amperes. Then we have the possibility of an arc occurring between one phase and the neutral and this would be also a severe arcing condition possibly of the order of two-thirds of that of the interphase arc. We then have a third form of arc which would be an arc for one phase to the earth metal work of the box and that would be an arc to earth and the current flowing in that arc would be determined by the resistance of the earth loop which, I think, we have now agreed with the plaintiff's experts would result in a current something below 4 amps. We than have what you might describe as insidious arcing or low current arcing which could occur in the contacts of the fuse carrier with the fuse base at the point where the screws fixing the outgoing conductors or the incoming conductors to the fuse base or again at any point of contact which might develop between the outgoing conductors and the metalwork of the box. This would be an earth fault current but would be of an insidious nature but it could persist wreaking its damage without being observe until that damage became sufficient to be visible to the eye. If an arc within one of those holes of the box persisted for long enough it would cause a considerable amount of heating and should the creation of that arc have been the result of load flowing through the outgoing conductors, one must presume that a similar load was flowing through another of the conductors, the only difference would be the addition of 4 amps to the one and not to the other in assuming the load to be in balance; therefore in due course a second conductor would fail on short circuit to the box and once you have two arcs to earth, you have then an interphase short circuit. An interphase short circuit, My Lords, whether within the box on their own or developing from two earth short circuits would rupture either the fuse in the box itself if it were at the top of the box, or the HRC protected

fuses if such arcing occurred in the box and that form of arcing would cease in the milliseconds. The insidious arcing at the contacts or in the terminal.....

COURT: I am not quite sure on one point. Are you saying that if you get two phase to earth arcs you are bound to get a phase to phase arc?

A. If the two are in existence at the same point of time yes. So, under these circumstances, My Lords, I would consider that any claim by the plaintiffs that the fire started through the occurrence of an interphase fault within the box must be founded on extremely unfirm ground. On the other hand the other form of arcing, the insidious arcing, occurring perhaps at the contacts or at the terminals requires either bad maintenance of those contacts or of the terminals bad workmanship of which we have absolutely no evidence at all, or the result of overheating which would in course cause the fuse contacts to tend to oxidize where they are exposed to air, on the other hand, these contacts are in very intimate relation; they are pressed together, under pressure they will spring of the contacts when they are pressed together and in contact there is no air and without air you get no oxidation. So, so long as the contact is good at the start oxidation at the point of contact is unlikely, indeed impossible. As regards the terminals, if the terminals are properly screwed up, I would point out that in this box the outgoing conductors and the incoming conductors are secured not by one screw but by two, then those screwed contacts would have to be loosened and the plaintiffs contend that this loosening could result from the expansion and contraction of the conductors under cyclic condition into the box. My Lords, these outgoing conductors were 18 inches would be contraction of those conductors over 18 inches would be unmeasurable and as they are free to move up, any expansion would be vertical and would exercise no thrust against the point which would be affixed, those conductors were stranded.

COURT: Why did you say that they are free to expand upwards?

A. If I have got this lot in a connector and this wants to expand there is no restriction at the top, its expansion would be upwards, there would be no force applied downwards. These conductors were two conductors of 7 strands each put into the same terminal. We therefore have a compressible body and driving

a screw into them will nest it and form an extremely good contact, would force the strands towards the side of the hole in the terminal or altogether form a far more reliable contact than we had a single solid conductor. My Lords, everything I say points to my certainty that no such arcing insidious arcing could have taken place in that terminal, it is conceivable in the contacts, I would regard it as inconceivable in this form of terminal. As regards that particular form of arcing also as unlikely in the extreme in this case the arcing to earth which at one stage the plaintiffs averred had caused the top righthand corner of the lid of this door to disintegrate, to vanish, it is now being described as a cutting once more. Now to cut through cast iron you need far more than the possible 4 amperes - we are not arguing these 4 amperes any longer - I believe Mr. Turner, in his evidence, gave a figure of 50 amperes as being necessary to cut; that is a sort of current I would expect for the purpose of cutting through steel or cast iron and such a current to earth was not possible under the earthing condition of the box. I must again, in my mind, dismiss the possibility of cutting through the door as a 4 amperes arc, even if such arc could persist through a necessary length of time. There is finally one arc in one of the holes at the top of the box. For this to occur you will have to have overload of sufficient value to heat the conductor to the point where PVC melts and flows.

SIR RAYMOND: What time?

A. It will have to be of course a continuous overload current, it could not be an instantaneous one, it would have to persist for some hours. If that current persists at a sufficient level which is of the order of 120 amperes, again, I think, we are in agreement with plaintiffs that the figure is of the order of 120 amperes continuous, then the PVC would soften and if those are of lateral force then the conductors within the cable might move firstly through the insulation of each conductor and finally through the sheathing and come in contact.

Q. I must apologize for going back to something which you have referred to. You have described the phase to neutral did you expect the phase to neutral to be about two-thirds - 2300 amps?

A. It would be considerably less than 2350 My Lords.

Q. Could you tell us with that state of things, how long it would take for the HRC to blow?

A. If it were a 1000 amperes, the HRC fuse would blow in .4 of a second. If it were 1500 amperes it would blow in approximately .1 of a second so that even if it was lower than 1000 or 1500 amperes the HRC would clear in a very short time indeed.

Q. So that the overheating would be negligible if at all?

A. Yes the current is there, the time is not.

Q. You have examined this box which has been burnt in the fire, which has been the source of the fire. Have you considered these marks which you will call extremely dubious marks, will you tell the court whether in your view they can obviously be arc roots?

A. I have been unable to identify the precise spots in the holes of the damaged box to which the plaintiffs referred, they have indicated an area by a chalk mark, I have myself not been able to identify positively anything in that area which I would say is an arc root.

COURT: Anywhere in the box?

A. In those holes.

COURT: Elsewhere?

A. Elsewhere there are many markings similar to those indicated by the Plaintiffs within the hole but they do not allege that they are in fact arc roots other than anywhere else. If what they point out in the holes are arc roots, I could point out to similar markings in many other parts of the box, I could not myself identify arc roots there or anywhere else.

SIR RAYMOND: There was a mistake in para. 4.5 which we would like to correct. It reads "in my opinion the energy of a three-phase arc with a current 2350 persisting for 13 milliseconds is insufficient" (instead of sufficient).

COURT: We have corrected it already.

SIR RAYMOND: Mr. Sharples, is this box meant to be hermetical?

A. No it is not.

Q. We have been told that bushings or bushers should have been used. Is the use of a bush anything to do with the sealing of a box hermetically?

A. No, the use of bushings will not convert this into the hermetical sealing of a box.

Q. What is the use of a bushing?

A. It is for several purposes. The primary purpose of a bushing is to prevent mechanical damage to the insulation of the conductor passing through. There are secondary uses of bushings particularly if the type of bushings sometimes described as a gland was used, that would serve to prevent water if the box as it is indeed designed is being used out of doors; it could prevent water percolating through, it could prevent extraneous matter from falling through the holes possibly accumulating inside on the contacts, insects and so on, but in this particular instance the box was in use indoors, so there would be no purpose in excluding moisture. As far as the ingress of insects and other extraneous matter is concerned it so happens that in this instance the cable used, these twin circular PVCs, what the engineer would describe as a bush fit, a force fit, but it is fairly easy to insert them and they effectively close the hole to the ingress of any such materials. It may be quite fortuitous but this was the case with this box.

R E C E S S

Monday 13th March, 1978

Bata Shoe Co. & Anor. v. The C.E.B.

AFTER RECESS

Sir Raymond continues the examination in chief of: Mr John Sharples (still under oath)

Q. Mr Sharples, we are reverting now to your supplementary memorandum, paragraph 4 (14), you have referred to Mr Turner's suggestions that the arching to which you made reference in paragraph 4-3 would have occurred and about the overloading in the arch going through the conductor and that the temperature of its PVC may rise to a point that the heat may vaporate through the side of a hole. You remember that?

A. Yes.

Q. When such contact had occurred, it is averred by Mr Turner that an arch of a current of 4 amps should strike and may continue even at this value. What would be the result according to you?

A. Even at this value there can be considerable heating at the point of contact.

Q. In other words, this theory of Mr Turner, if I understand it rightly, is based on the same subject of overload of the box?

A. Indeed, before the conductor could migrate or move through the PVC it must previously have been softened by an overload current.

Q. By a momentary overload or continuous or sustained?

A. The overload would have to continue for an appreciable period.

COURT: Can you define that period?

A. It would depend on the value of the current.

Q. Would you put it to 120?

A. It would be perhaps half hour, or that period.

SIR RAYMOND: Let us assume that one of the conductors had actually got into contact with the edge of the hole due to the fact of the migration; would you say that ignition of the PVC would be continous along the conducting wire?

A. No, it could quite well develop a heat at the point of contact sufficient to ignite the PVC at that point but with very considerable weight of copper in the cores of the conductor the local high temperature would be conducted always from that point but just a very short distance, an inch of it would dissipate by the burning of the PVC, it would be localised to an area of perhaps that of a 50 cent piece or a rupee piece.

Q. It might be calculated in?

A. Approximately one kilowat, 4 amps. a little less than 1 kwt.

Q. If the PVC would be ignited from an external source, it would continue to burn if you exceed 400 degrees; do you share that opinion?

A. Yes, I do.

Q. You have also heard the statement that he had seen the PVC sheath of the arch of an outgoing cable crumble; can it crumble?

A. The process of heating the PVC starts with softening of the material; this is followed by melting, when it is melted sufficiently it would flow at some temperature above flowing which is round about 150 degrees, at 400 degrees centigrade if an external source of flames is applied to it it will catch fire. At none of those stages does it become crumbling. The process is speedity through thickness, melting, flowing, flames. After the flame has burnt the PVC always leaves the ash, the ash crumbles. The

combustion must have occurred before.

Q. Can the PVC on the conductor outside the box reach the point of combustion before that part of the PVC which is inside the box?

A. With the conditions we are considering with heat generated by the passage of an overload through the conductor down to the fuse, that same overload passing through the fuses, the fuses being of very much smaller cross section, that will generate a very great deal of heat and the temperature of the conductor is very greatly predominantly influenced by the heat arising from the fuses to which it is attached, to the terminal, it is for that reason that the temperature of the conductor shows that the highest temperature in the conductor immediately pushed to the terminal connecting the conductor at a point of blowing and is of the order of 1100 degrees centigrade. That is transmitted up through the conductor, through the terminal into the conductor and up the conductor. At the top end of the conductor the temperature is very much lower because there it is depending solely upon the overload passing through the conductor. Therefore, the temperature of the conductor is hottest as it leaves the connection in the box; coolest at the top where it passes through the bimetallic and there is grave danger. It follows that the temperature of the conductor and its insulators is greater, lower than above the top.

Q. What I would like you to explain to us is this: what will be the hottest part within the box?

A. I take it from the question hottest within the hole of the box including the fuse carriers; the hottest part would be at the centre of the fuse wire located within the asbestos tube by which it is surrounded.

Q. You have got the central part of the fuse wire. Does it decrease from the centre part to the top or bottom of the fuse wire?

A. Both ways.

Q. By the time the fuse blows, it must have reached a temperature of roughtly 1100 degrees?

A. That is correct.

Q. If it reached 1100 degrees at the middle part of the wire, will it have decreased substantially from that part to the top and the terminal?

A. Very substantially; I would have expected it by the time we reach the terminal, perhaps 250 degrees.

Q. Your experiments have proved that when the fuse blows, namely, when it reaches the temperature of 1100 degrees, the temperature of the outgoing connection on the top plate would be reduced to a maximum of 204 degrees.

A. That was the maximum temperature measured in our experiment at the point of about half an inch above the terminal and this temperature of 204 degrees compares very closely with the temperature of 260 degrees in the ERA test.

Q. Can we therefore conclude that the fusing point of the wire when it is 1100 degrees, the temperature of the outgoing cable at the hole on top would be of the order of 204 or 2150?

A. One would expect the temperature to fall as one goes further up to the hole. In this test our temperature at the star point was 83 to 84 degrees; that gives a drop of temperature as one goes northwards of about 7 degrees per inch; so in my opinion by the time we move upwards to 204 degrees thermo coupled to the hole in the box to a distance of 2 inches we would expect to find 190 degrees at the hole.

Q. It seems rather extraordinary to imagine that within a short distance the metal can lose so much of its heat. Could you refer us to heat at the middle?

A. If one holds a needle in the flame of a candle, the point will become red hot possibly white hot and yet certainly will be above to continue to hold that needle, you have a temperature at the point of 1200 degrees; your finger may feel warm, may be at 100 degrees. You have a steep fall from the point which is in the flame down to your fingers.

Q. In paragraph 7-10 of his report Mr Davidson says that the PVC would start to deteriorate, i.e. flake off and crumble within about 30 seconds when heat at a temperature of 250 degrees is applied to the sheath. Do you agree with that statement?

A. No, My Lord. I cannot say that, I have not observed that phenomenon.

Q. Have you observed the reverse?

A. At that temperature of 250 degrees, it is in a closed sheath and would be sticky. I cannot imagine it crumbling. It will

probably commence to emit gases, I might say little spirits of gas incandescent gas coming. But I cannot describe it as flaking and crumbling.

Q. By the time, at the bush hole, the temperature was 204 degrees the fuse must blow, then the outgoing cable could never reach 250 degrees?

A. If one assumes that a temperature of 1100 degrees at the centre fuse results in a temperature of 190 degrees at the outgoing hole and those two temperatures are very closely related, one must assume that when the temperature at the hole reaches 190 degrees then the fuse is on the verge of blowing. That being the case, if the temperature was 250 degrees at the hole, then the fuse would blow.

Q. I do not know whether I asked you the question whether the temperature of the heat inside the box would be greater than that outside the box?

A. Indeed the question was put and I replied that it would.

Q. Before the part outside the box could ignite and afterwards crumble as suggested, the part inside the box must have actually been on fire?

A. Yes.

COURT: About the state of the PVC which would make it crumble. I do not remember that it has been intimated that the mere action of heat would cause it to crumble. I think when it is subjected to successive heating and cooling, finally it is "echauffe". I do not know how you call it in your sphere?

A. I would regard the crumbling as taking place when the PVC is being reduced to an ash, as being carbonised and has become an ash. It is the last process before disintegration of the PVC altogether, and would not occur until after it has been ignited or raised to a temperature in excess of 250 degrees.

SIR RAYMOND: When cooling and heating in succession could not cause it to crumble because it has actually been set on fire?

A. It cannot crumble because it has not been set on fire.

Q. Can you give a description simulating the applying of heat through the conductor, later to the PVC and the cable and see where the PVC would flow (Witness demonstrates) You will observe a few little spirts and then

there's gas which then begins to be emitted.

Q After the experiment do you think you can draw an inference?

A. There is an indication of a slight colour here which indicates that there has been some movement downwards; it's soft here and I think I can detect some flow here where we actually saw the PVC commencing to burn. I can describe that as crumbling. There it is sticky rather than crumbling.

Q. Can you draw a conclusion from the point you applied the flame to the bottom of the cable up to the point you have been holding it; there has been considerable loss of temperature?

A. Yes.

Q. That would not have been sufficient to make the PVC to flow at 4, 5 or 6 inches outside the hole of that box?

A. It is apparent that the affected heat was localised heat and not progressed up at all?

Q. There is great difficulty to get it to flow. Assuming it has been flowing with the heat, can you imagine that it would flow down and come up to the top of the box, how would it behave?

A I can imagine the source of heat was in the hole the colour of the PVC might have formed immediately around the top of the hole and there it would form an annular size. I cannot conceive flowing on the top of the box.

Q. And drop on the floor?

A I cannot see the flowing to continue unless the box itself has risen to a high temperature; if it has not reached 500 degrees then it cannot flow on the edge; if it did not flow on the edge there cannot be any progress.

Q. Assuming that it had even flowed over the edge and that it was gradually, as you explained, coming down slowly to the floor. What could possibly be its temperature by the time it reaches the floor?

A. It would be cold. I do not think there is enough PVC in 18 inches even it has completely melted away to form icicles of PVC to flow down to the floor This is four feet away.

Q. The heating point of cardboard, we have been told is within 230 to 250 degrees?

A. I do not know, I would not dispute it.

Q. Assuming that it had eventually fallen down on some box which had been placed there we do not know by whom under the henley box,

it could have been cold and could not have set fire to the box?

A. I do not believe that if a drop of this PVC had caught fire up here, the drop still flaming on the cardboard that it will continue to burn. It would not support combustion, it is other than an ambient temperature; if there was fire in the wire then combustion would continue. It is not a self supporting process. There must be flames applied to it unless it is ambient temperature. I cannot see even a huge drop of PVC when it starts to be on fire continue to burn when falling on the cardboard and set fire to it. If it was petrol down, then perhaps it would.

Q. In paragraph 4(a)(b) the word 'not' should be 'no' and in 4(a)(c) second line and 'and' should be 'an'; 4(a)(4) page 2, it would suffer burning instead of 'burning'.

Q. Would you explain to the court what in your view were the conditions in which the box fell to the floor referring to your report; it must be much simpler to describe it?

A. I presume counsel's question is that we do not wish to reiterate what I believe the plaintiff's version It is I think quite clear the condition of the box that we see here that the top left right hand hole (box shown) there has been considerable amount of plaster in the holes when it fell from the top. Further indicating is that this top plate here has a bruising. Plaintiff's witness indicates to me as corrugated iron up and down. This has been this top plate becoming red hot. There is evidence here where the top part was beginning to crush in. Finally, on the back of the box we see a lot of plaster and cement which would have been there had the box been affixed to the wall without any fire. I believe this again has fallen down the wall and with the heat of the box had adhered to it. These three points indicate to me that the box remained vertical for some considerable time after the start of the fire. That room had so much heat to heat the box to such a degree of heating that it has to pass it to sally. The next stage would be that the heat applied to this box would force it to expand against the residence of the steel which fixed it to the wall and that pressure snapped the fixing plugs to this extent. We agree with plaintiff that it was heat which caused the.....

The plaintiffs claim that it was caused by

internal arching. I claim that it was the result of heat applied to the box. At some stage probably before the box detached itself from the wall the heat had caused the holes which attached the hinges on this side and both here which fasten the door which caused the brass to melt to be expanded. At that stage the door of the box fell on the concrete floor and cracked off the top right hand corner. It will break even from a height of 4 or 5 feet and at a sensible angle, but if it fell flat it may not break as it is here. I do not know into how many pieces it can break into. It may break into two or more pieces. It may include that lug. The edge of the door can be seen from the drawing. The face of the door is very thin. It is about $\frac{1}{8}$ inch. This material here is perhaps $\frac{1}{8}$ inch, may be 3/16ths inch thick. It is thin compared with this. This is thick. The action of high temperature on the edge will cause this roughness and the same roughness indeed is to be seen at the edge of the top plate.

I refer here where it has been burning all this cast iron top plate and its left edge here, they are very similar to the edges which I can result of arching. It is outside the box; no question of arching was made. All this is burning of metal by an external source of heat not by arch. Why this appearance here should not have been the result of the fire in the room rather than of an internal arch.

Q. It has also been suggested that bimetal conductors were such that all the six wires could not be introduced and that some were introduced and some were not. Have you ascertained that it can easily be made to penetrate inside the bimetal conductor?

COURT: In your experience, I think you have already seen objects made of this sort of metal breaking after a fall. Have you ever seen such a broken piece of metal breaking along such a line.

A. It would break along a purely smooth line, the jagginess is the result of fire intensely acting on the edge. If you were to look at the edge of the top plate which also has a smooth edge you can see how it is. The front right hand edge, this side is clear indication of the fire. It is almost laminated.

Q. It would not appear that one of those hinges ever melted?

A. That is not correct. That is a steel pin that is there. There is a piece of it that is not melted.

Q. Everybody has been saying that the pin holding the hinges can be seen to be still there?

A. It is brass, unmelted. I think the door fell down on the floor like this.

(At this stage the witness is requested by court to point out the different parts as mentioned by him in the course of his evidence)

Witness points out the different parts near Bench.

SIR RAYMOND: Would you say there would be no difficulty in introducing the 6 cables in that bimetal conductor?

A. The six neutral conductors from the concentric cables might be considerably fitted into this bimetal connector; there is ample room even for more. I can see no good reason why any workman would go into trouble of putting them or re-open them round.

Exhibit put in, marked "11"

He would put all 6 together there, the length of that and then tighten the screws.

COURT: What about the other one?

A. That goes into the lower half. In addition to the six we have another one coming here. It is the 7th conductor the vertical one going into the right hand hole.

SIR RAYMOND: Mr Davidson has stated in paragraph 6-30 that this box in Bata warehouse was a fire hazard? Do you agree?

A. No, My Lord.

Q. In paragraph 7-1 of Mr. Davidson's report "Temporary installation..... should be subject to test"; what do you think according to you?

A. I agree that a temporary installation should be no less safe than a permanent one. For the second part I feel that the CEB has indeed periodically examined this installation. It found at one stage that it was necessary to fit the yorkshire fuse. It was put in March. In May they installed a yorkshire fuse; they visited the box on numerous occasions as we have heard. This gave them every opportunity of seeing whether the fuse carrier, the contact and the terminals and the rest of the installation were in good order. I cannot think of more

frequent periodical visits to the temporary installation to receive more attention than the permanent one.

Q. Paragraph 7-6 of Mr Davidson's report, he gave the fuse:

"The 18 gauge fuse wire in double..... 100 amps."

He assumes in his previous paragraph that the figure given by the manufacturer should be preferred to the one in regulation 102. With 45 double it makes 90. In paragraph 7-c, he says double wire of 50 should amount to 100 amps. Do you agree. Mr Turner has agreed that it should be in the neighbourhood of 75 or 80?

A. He started with 50 amps. We prefer to follow the table in the IEE regulations and doubling 45 would be 90. When you twist the two together you do not get double. We agreed with Mr Turner that the figure of 75 to 80, after the 75 being half of the 150, but we agreed to 80 amps. being half, in the ERA test, of the two 45. I think when Mr Turner was in my position here, we settled on 75 amps.as being the two twisted.

Q. The conclusion drawn by Mr Davidson, page 8, is that there has been no less than 11 suggestions for that conclusion. The first one is "the henley fuse service unit..... due to over fusing." Let us first stop with the word 'called upon'. Would you think you are called upon?

A. No.

Q. He has referred next to the contamination of contacts in the fuse base, the fuse carrier, what do you understand by contamination of contacts?

A. I presume that he has referred to extraneous material and insects.

Q. Do you agree that insects or moisture of dust would cause contamination of contacts in the fuse base and the fuse carrier?

A. Not in the least circumstances because the conductors used through the edge of the box were exactly as they were when they were placed; this would serve the purpose of the work.

Q. Nest is the absence of non ferrous bushing. We have dealt with that. The next one severe over heating of one or more of the outgoing cables from the henley fuse box. Can you say that there has been at any time or there could have been at any time during the period under reference severe over heating of one or more

of the outgoing cables from the henley fuse box?

A. In my opinion there has been no overloading of the box and for that reason there cannot be any severe over heating.

Q. Paragraph (e) drop of PVC. "The damage to the cables passing..... leading to cause a short circuit". You have spoken of heat necessary to soften the PVC, a fortiori of the state of the copper conductors to allow them to come into contact and causing a circuit. The "method employed..... breakdown". No method of joining has been described by Mr. Mamdally. Can you understand that particular suggestion?

A. It is extremely farfetched; it was an 18 inch wire. If it has been so badly damaged one would have replaced the whole length right down from the terminal to the bimetallic conductor. There is no need for having trouble cutting it and joining it.

Q. "Damage to the fuse base terminal..... of the outgoing copper conductor"; am I right in saying that in your view if there has been anv expansion the expansion would be on the loose end and not at the base?

A. Yes.

Q. Paragraph (1) "Over heating of the contacts of the fuse base.....for the heating". What do you understand by that one?

A. This again is a fact which is conditioned upon over heating having taken place. If there has been no overheating, there has been no resulting loss of temper (?). It is over heating over a considerable period more so in the case of these contacts than in the case of the melting of the PVC because the loss of temper would require more time.

If in the case of melting of the PVC I referred to half house, necessarily this would require hours, possibly days of over heating.

Q. Over heating by bimetallic conductors. We have dealt with that already?

A. I do not think it has been raised at all.

Q. You have answered that by anticipation. By saying that there could not be over heating reaching the height. The final one which was introduced in course of re-examination of Mr. Turner was the sustained arching in the fuse box. This is why we have the term low current arching?

A. The only arching which could have been sustained

would be the arching in the hole which might have been the consequence of the softening of the PVC resulting in the migration of the course till they come into contact with the hole. This depends entirely on the over heating. No over heating then no migration, no current arching.

Q. In that case the PVC would not be the cause of the fire because it would not migrate and still will drop to the floor?

A. Yes.

Q. You have heard the evidence of Mr. Dorsamy Lowtun. The gentleman who was working on the day of the fire in the packing section and he has referred to a noise which he described as boom?

A. I do.

Q. In your ASTA report you stated that there was a slight report at the time of the arching. If the boom is the equivalent of the short report that he has reported at the time of the short circuit, could you explain how 10 minutes at least after the boom and perhaps more a three phase motor was still working?

A. It would be impossible, if the boom heard by Mr.Dorsamy corresponded with the report that we heard during the ASTA test it would indicate that there has been a weak short circuit in the box and now if there had been a short circuit in the box all three phases would have been disconnected in the box and the motor could not have run.

Q. If the phases have balanced, would even one phase stand or would one of the lights have gone out in the Imprimerie Ideale. If the phases were balanced, the witness said at Ideal Printing the three head lights were there after the alarm of fire had been given; all the three lights would have been visible if there had been a short circuit in the box?

A. Indeed no.

At this stage the case is adjourned to tomorrow Tuesday 14th March, 1978, for continuation.

Tuesday 14 March 1978 at 10.30 a.m.

Before the Honourable M Rault, Acting Chief Justice
Honourable P. de Ravel, Judge

Sir Raymond Hein, Q.C.:

I should like to inform the Court that we are arranging the test now and that during the recess we shall invite our friends if they could, to visit the spot during the recess where the test will take place.

Court: Thank you.

Sir Raymond Hein, Q.C. examines Mr John Sharples.

Q. Mr Sharples, yesterday I have apparently omitted to ask you in so many words whether in your opinion after all you have stated and set whether the box in the Bata warehouse could have been the cause of the fire?

A. My Lord, in my opinion the Henley box in the Bata Warehouse on the 6th July 1972 could not have been the cause of the fire.

Q. In his report, in the 6th chapter, Mr Woodcock had stated that PVC would ignite from an external source in an ambient temperature of 400°C and it will continue to burn, I understand it will continue to burn if the ambient temperature remained 400°C?

A. Yes my Lord. PVC can be ignited in a surrounding area as a temperature at a temperature of 400°C. To ignite it requires the applicqtionof an external source of heat. It will continue to burn if the ambient temperature remains at or about 400°C if it is taken out into normal temperatures, it will go out.

Thank you Mr Sharples.

Cross-examined

Cross-examination

Xed by Mr David, Q.C.

Q. We might immediately deal very shortly with this aspect of the case. Could we first of all consider a candle, if we take a 6-inch candle which is, I am given to understand 8 to the pound and you burn it, I am given to understand, that burning one inch an hour will give an approximate heat of a 100?

A. I can't say my Lord.

Q. Do you have an idea yourself?

A. No my Lord.

Q. Now you know that Mr Turner has been suggesting that the heat which would have been generated at the relevant time would have been of the order of 1 Kw?

A. Yes my Lord.

Q. Do you agree with this?

A. Yes my Lord.

Q. And Mr Turner has equated approximately this kw to a fire heater that would be burned?

A. Yes my Lord.

Q. In those circumstances as on the one hand you do not know the properties or you cannot say anything of the properties of the candles but you can about that of a fire heater, don't you think that the test made in the circumstances should be with a heater of 1 kw approximately?

A. My Lord my endeavour yesterday was to light the PVC, to heat the PVC with various available means of heating. I did not have 1 kw.

Q. Mr Sharples, let us understand each other. I am talking about the test which is proposed to make today during the recess. Today during the recess is proposed, if I understand, rightly to try and see whether the PVC will ignite cardboard or some such tests. Well I am asking whether the appropriate thing to do the closest end to the actual situation would be by using an element for a higher heater of approximately 1 kw.

Sir Raymond Hein: The test which we are trying to propose is to have the identical box with the identical cable and to be put at 140 am.ps, this is the average at Plaine Lauzun in order to try the duplicate the conditions which might have existed in the Bata Warehouse not with the heater.

Q. I take note of what my friend Sir Raymond has said but I am asking you whether the test which I am suggesting would, in the circumstances be helpful?

A. May I ask the question in a slightly direct way? The test is being conducted in such a way that should be the PVC soften and permit the migration of the copper cause so that they come in contact with the box, an earth fault will arise similar to that in the box, the earth fault will, as far as we can be limited to about 4 amps and this would be the current generated by the arc and would resemble the 1 kw which learned counsel is referring to. It will only occur if the cause of the conductor come in contact at the

top of the box as they are alleged to be done in the Bata Warehouse.

Q. Mr Sharples I quite understand what you are saying. There will of course be variables and you cannot guarantee to simulate the actual conditions on the 6th July?

A. Agree my Lord.

Q. Over and above that test that you wish to make and that you certainly may make, don't you think that it would be helpful to see whether cardboard will ignite when coming in contact with PVC that has been subjected to 1 kw of heat?

A. It will be helpful my Lord, if incandescent flaming PVC can be dropped on to cardboard from a height of 4 to 5 feet to see whether the cardboard ignites.

Q. Being given the attitude we shall attend the test made by the defendants but we shall invite the defendants to attend the test that will be made by ourselves?

Court: That would be a fair exchange.

Q. Now Mr Sharples, yesterday we were dealing with, at a certain stage of bi-metallic connectors and you were explaining how they were fitted. There has been said in evidence that these bi-metallic connectors were wrapped up in insulation take which apparently were of linen material?

A. I heard that my Lord.

Q. Would you consider that, a satisfactory installation?

A. As I understand my Lord these bi-metallic connectors were some 6 or 7 feet from the ground in the room within the Warehouse to which the public as a whole do not have access. Such insulated tape if properly applied would fall adequate protection against shock in an installation which is bolted to earth of which 230 ohms and which was not intended to continue in being for more than a few months.

Q. If it had been intended to continue for more than a few months, what would happen?

A. I think my Lord if it would mean intended as a permanent installation I would have at least made arrangements for the concentric cables which were joined to the vertical cables in the box to have themselves gone direct into the box. Inthe few moments that I am disposed I can't think of the precise but I would have endeavoured to have avoided a bi-metallic connection at all and it is not necessary to have a bi-metallic connection indoors because they protect against electrilitic action between

aluminium and copper which could only take place in moist conditions and indoors it was not really necessary to have a bi-metallic connection at all.

Q. You don't think that if, let's say the piece of wire we have that is the outgoing cable going from the top of the box to the bi-metallic connector let's say in fault at the connection of the cable with the connector and let's say they had been found, could not the linen insulation take fire?

A. It would depend on the type of fault my Lord.

Q. But if there were fire this linen would have caught fire?

A. Yes.

Q. And what could have been the consequences of this linen caught fire?

A. It would burn and disintegrate.

Q. Without consequences of repercussion on its neighbourhood?

A. It might have melted PVC within the immediate vicinity, I doubt it. In my opinion it would not set fire on the PVC either on the concentric cables above it or to the PVC of the cables below.

Court: Short circuit between the cables?

A. They are well separated. Well, should they have been tied in bundles, the insulation melted, there would be a short circuit between the bi-metallic connectors which will be of sufficiently high amperage approximating to the amperage in the box had there been a short circuit there over 2,000 amps and the fuses in the box would blow in a fraction of a second.

Q. The pieces of linen burning would have fluttered to the floor?

A. Fluttered is not a description I would use, it would have fallen. My Lord the linen tape around the connectors, it could have burnt to ash.

Q. Ash but not pieces of

A. I don't think so.

Q. Mr Sharples, I have already since yesterday given you a little sketch. If we look at point "W" from about "W" the cables should have been hanging loosely down to the bi-metallic connectors and would then have slotted in the top holes of the Henley box. Now what do you yourself think about this installation whereby these cables would have been allowed to hang loosely?

Document BJ produced

A. My Lord, the drawing doesn't show what sort of attachment there is at point "W" before giving my opinion I would like to know what the attaching point "W" and from W to Z.

Q. We have been told that from W to Z there would have been clipped by intervals?

A. And is there any indication as to the height of W about the bi-metallic connectors?

Q. Yes, the witness has stated that there may have been a clipping just after W that is downwards. He cannot be certain but that certainly 5 feet over, above the bi-metallic connector was loose that it was not clipped to the wall. I am speaking from memory.

A. In my opinion my Lord it could have been done better. I myself would have fitted in further clips at one foot intervals probably 3 clips between W and the Bi-Metallic Connectors that it would be a better job.

Q. Would it allow any bias on the part of those hanging cables?

A. If bias you mean lateral movements, yes my Lord, it would.

Q. Now, is it not of fundamental importance in electrical engineering to ensure that no strain is put on connections?

A. It is important.

Q. Do you agree Mr Sharples that the cables which left the Henley box the Bi-Metallic Connectors and the aluminium cables were not secure in such a way that strain would not be put on the connections?

A. As far as connections inside the box my Lord below the point Y there would be no strain imposed by the arrangement of the conductors above the box. As far as Bi-Metallic connections are concerned they are very substantial connectors and any strain imposed by those very relatively short free-hanging length would not in my opinion have endangered the connections in the sense of slackening the connections and giving rise to heating at that point.

Q. Would the bias which you have agreed would exist have any repercussion?

A. I think I have already said my Lord that this bias could permit the migration or decentralization of the copper falls within the PVC if the PVC has softened.

Q. Now Mr Sharples just one small point before we proceed to your report, the IEE Regulations specify a minimum bending radius of 6 to 8

times the diameter of the cable.

A. The IEE Regulations for the Installation in Buildings my Lord, consumers' installation in building they do not apply to public authorities unless there is legislation in that country to that effect and as far as I know the IEE regulations have no such authority in Mauritius.

Court: It's safety measure to protect consumers?

A. It's a code of practice.

Court: A code of practice which aims at protecting consumers?

A. It is a good practice to do so.

Court: What is good practice to the consumer is normally a good practice for the supplier?

A. Not always my Lord because in certain instances of bringing supply to two buildings are often such as to make the application of IEE regulations as they stand impractical and there are other aspects which have been mentioned in the plaintiff's case such as the fusing of short circuits to which the IEE regulations cannot apply to the authority.

Court: Do the regulations apply to this bending radius?

A. It would have been good practice to follow the regulations.

Q. We have a cable admittedly outside which is in Court now, do you accept now that a similar restriction should have been placed on the aluminium cables on the down-stream side of the box but if we look we can see the loops

Court: Which loops please?

A roll of electric cables produced

Q. What sort of wire Mr Sharples?

A. I would say fairly soft copper wire.

Q. These are aluminium cables are they?

A. Yes my Lord.

Q. Do you approve of this Mr Sharples?

A. My Lord, I don't think that the loop and the binding round them represent accurately the actual means of attachment to the external walls of the building. In order to dismantle them the loops must have been undone and have been very casually rewound like that, I cannot believe that that was the manner in which they were bound to the insulators. I did not see the insulators at the time and I cannot believe that that very casual binding is anything other than

a form of retieing the arc of the cables after they were dismantled.

Q. But if it were so, I cannot do otherwise than ask you if they were so Mr Sharples?

A. If they were bound like that it would be a very casual job indeed.

Q. Poor workmanship?

A. Poor workmanship.

Court: Is there any evidence of its original state?

Mr David: The only thing we have is that this cable has been put in by my friends and there has been no evidence as to what has been done.

Mr Sharples, if you look at the end of the cable, the end nearest to Bata, would you agree that the damage to the PVC at the end of the cable which was nearest to Bata is an actual example of the effect of heat on PVC?

A. Yes my Lord I would.

Q. Mr Sharples we turn to your report at page 2 you have already explained to my learned friend what you meant by subjective and objective but you agree of course that the object in Court is to establish the truth as to what happened in this incident using all the evidence available that is our common object?

A. Yes my Lord.

Q. Now you say that you have been attempting the object of this test which was to find and see whether the box could be destroyed?

A. I say my Lord this is how the box would re-act under substantial overload.

Q. Did you not yourself before doing this test, the short circuit test, do any calculation to establish the level of the short circuit in the actual situation?

A. At that time no my Lord but we knew that there was 150 kw transformer and as Mr Davidson himself did he use the 5% amp. and from that it is that the maximum short circuit would not be greater than approximately 3,500 amps and it was with that in mind that we established those tests not when we arrived in Mauritius did we have information accurately to calculate the short circuit which we now calculated at 2350 amps.

Q. Because it is quite clear that the test represents the actual situation?

A. We knew that it was much greater.

Q. Is it not a fact that devices which produced 3 burning uncontrolled arc internally are known to fail in the tests at reduced prospective current?

A. I am not sure of the question.

Q. Is it not a fact that devices which produced 3 burning uncontrolled arc internally are known to fail on tests at reduced prospective current?

A. I take it that the question is that if they passed a test at a high prospective current they may subsequently fail at a lower current.

Q. Are not for instance fuses and circuit-breakers known to fail at reduced prospective current after having passed the test at maximum level?

A. Circuit breakers which have been designed for certain prospective current have been failed, the reason for such failure I am not aware of.

Q. In the ASTA test don't you agree that the test had been satisfactory, there should have been no interphase within the box?

A. No my Lord.

Q. Would you care to give to the Court an explanation?

A. Because my Lord we have submitted the fuses to very much higher stress than they would design for. When one of the fuses blew, it ruptured the asbestos tube in which it was in this case and that I believed was one of the causes of the start of the arcing. I do not believe that that arcing would have commenced through the box not exceeding 4,000 amps through which the box was designed.

Q. We come to paragraph 2.7 of your report wherein you mentioned the flash which was accompanied by a small eruption of sparks and you also referred to the evidence of damage to the conductors and top plate you referred in the photograph.

Now, in that respect, I should like to refer to page 9 of your report paragraph 4.2 when you are dealing with arcing theories and there you referred to the two small and extremely dubious markings. Now, it is quite clear that by your own comments on the side arc which burns, you show that the ASTA test did not stimulate what happened in practice. It is obvious because the burns in the ASTA test were quite severe. I am referring to photograph 13937.

A. My Lord, at sheet no.5 of the ASTA test

marked 'B' at the foot of the page under the heading "General", there is a mark the cut out top plate bush holes were slightly damaged by arcing. The photograph gives the impression of a great deal of damage. The impression given in the photograph is because there is a lot of copper splashed about the plates, place, the cast iron was only slightly damaged.

Q. Even that damage is more substantial than the dubious markings on the object box?

A. The word 'dubious' my Lord is I think the plaintiffs' description. They were not sure themselves. I could not trace any marking which I can identify.

The whole aspect of the box has been severely affected by the heat to which it has been subjected.

Q. In one there is clearly visible damage, in the other you have great difficulty in seeing it?

A. Yes my Lord.

Q. Now in paragraph 2.8 of your report when you are talking about the fountain. The "sparking" from the points of contact was, in fact, small globules of molten copper in a state of incandescence. They appeared to form a small fountain for a fraction of a second but had lost their incandescence even before falling below the level of the top of the box. Are suggesting that because the fountain of incandescence copper globules was not incandescent, they have lost their incandescence when they had fallen to the level on the top of the box, are you suggesting that because of that they would not be capable of igniting materials that would be around, underneath?

A. That is what I was suggesting.

Q. Can you tell the Court what temperature is required to ignite materials such as paper and cardboard?

A. I was given to understand by Mr Davidson that a figure of 250^{o} I would not like to agree or disagree of that figure. I have no knowledge of the ignition of cardboard, paper etc.

Q. In fact I would advise to suggest $230^{o}C$?

A. I could not argue my Lord.

Q. Would that alter your opinion?

A. No, my Lord.

Q. Can you say what temperature globules could be at that moment, they ceased to be visible? They loose their incandescence.

A. By 600°C. The melting point of copper is about 800, they would be lower than that 5 or 6 this is my guess my Lord.

Q. Now if so it follows does it not that there would be a risk of igniting paper and cardboard so long as the globules remain about

Court: Above or about 200 or 230.

A. No my Lord because copper globules are still cooling extremely rapidly

Court: The question is: if its temperature was between 200 & 300, was it in a position to ignite cardboard or paper?

A. I still say No my Lord. The pin point mark on the cardboard or the paper there is no sufficient heat in a small globule of that sort to ignite cardboard.

Q. I am advised that I must disagree with you on that point.

A. May I try to explain my Lord. If I leave a cigarette burning on that it will leave a black mark across it, it is most unlikely to set it on fire a little globule of copper might leave a little black spot. There is not enough globule to spread on that spot.

Q. We didn't know in any way refer to paragraphs 2.9, 10, 11 because of the minor amendments that you made as a result of your conversation with Mr Turner but I should still in respect of paragraph 2.11 ask you what would you have expected if there had been a sustained arc dwelling on a point on the case at say 1500 amps?

A. I would have expected damage to the cast iron on the case at that point.

Q. In fact the sort of current that can be seen in the blue phase arcing to the case at about 13 m. SECS. after initial of the fault in the ASTA report?

A. Yes I know which graph you are referring to. There is obviously some current at that point and there is evidence that that line is not absolutely strict over a period from 13 m. secs to 26 milliseconds. There is wabbling on that line which indicates that some current was blowing and since it has 1 centimeter vertical measurement it represents 5,000 amps which is impossible for me to say that the current was during that period at not more than 100 amps.

Q. We have suggested 50 to 100?

A. I have said not more than 100.

Q. And this would have produced arcing?

A. Yes it is the current in the arc which was a current at time. It would have produced damage, it might have burned the whole if the arc remained fix if on the other hand the arc travelled across the metal the cutting effect which we showed but it would depend entirely on the thickness of the metal to which it was applied.

Q. Now at paragraph 2.12 you have stated your opinion, you referred to the conclusion that you drew from the test, you say that the Henley box is conservatively rated and constructed?

A. I have to correct if I may. I do not say this, it's the ERA conductor by the plaintiff which showed that it was conservatively rated and constructed they are not my words although I would agree with that.

Q. The box appears conservatively rated and constructed but you agree that the temperature attained by current sustained by 2 No.18 SWG wires are too high?

A. Yes.

Q. Now you agree that if currents of above 120 amps are sustained in the box for a sufficient time the cables will have this insulation in a flowing condition which will permit a conductor to move towards one side if it experiences some force in that period?

A. With that I would agree 2/3 of the way. If the PVC were softened but not necessarily in a flowing condition at 120 amps, 120 amps would certainly soften the PVC, it would not necessarily cause it to flow but I agree it would be in a condition in which the movement of the conductors decentralization or migration of the conductors would be possible.

Q. If it experiences some force like for instance if there were a bias towards the wall?

A. Yes my Lord.

Q. And eventually it would touch the case?

A. It could touch the case.

Q. Now we go to the load - potential and actual, chapter 3. I go directly to paragraph 3.2, would you go along with me if I were to remove the three nots:- if it is established that such persisting loads did arise then there could have been the overheating contended by the Plaintiffs and the box and its equipment could have caused the fire.

A. Yes my Lord.

Q. Once the contacts have deteriorated, will not a smaller overload current be sufficient to maintain an overheated condition?

A. Which contacts.

Q. The fuse contacts.

A. It is not distinct my Lord. The contacts between the fuse carrier and the fuse or the contacts of which are excluded into the fuse base.

Q. My instructions are any contact inside the box. I start with contact at the top terminal, once the contacts at the top terminal have deteriorated will not a smaller overload current be sufficient to maintain an overheated condition?

A. Yes my Lord.

Q. Now, when we come to paragraph 3.3. You refer to the fact that there has been no bad practice, no negligence on the part of the CEB. You have already agreed yesterday that for however short a time a temporary installation is installed it is still essential and it's a safe matter and earlier on today we had it that generally speaking although you give some exceptions what is sauce for the gander should be sauce for the goose. I am referring to the authority and of course to the consumer. Now since Mr Jean condoned the overfusing this must have been based on knowledge that the overload exceeded the 50 amps rating of the box fitted with one No.18 SWG?

A. Exceeded the 45 amp. rating of the fuse wire not the 50 amp rating of the box.

Q. Once more when you talked about the 45 amps you are relying exclusively on what you read in the IEE Regulations?

A. When I read, Mr Woodcock ascertained that figure of 45 amps referring to the Manufacturers Handbook which quotes the regulations.

Q. In the present instance we have the manufacturers' label that gives the reading at 50 amps.

A. Yes.

Q. And in the IEE Regulations we have a note to which I have already referred the use of..... is normally recommended where a new fuse is used. The figures given in the above label is .45 will in the absence of recommendation made by the meter of the fuse provide an approximate guide to the size of the wire required. Don't you therefore agree Mr Sharples that in view of

fact that we have the label put on by the manufacturer we should go by what the manufacturer himself has said.

A. No my Lord. The coils of fuse wire were supplied in bobbins and will have the gauge of the wire marked on those bobbins and probably the fuse rating. If the fuse rating was not marked on the bobbins, I would refer to table in my possession because I am looking for a fuse wire within the box miles away, I don't go out, open the door and if the label is still there, I'll go back and get the correct size of the fuse wire. I take with me a wire which is stated to carry 45 amps.

Q. But Mr Sharples here I am, a responsible authority installing a Henley fuse unit and having, I am sure, at hand all the requisites I can see a label here where the manufacturer has taken the precaution of putting 0.48 and we know that that refers to the one hinge it has here 50 and he goes on fusing current 102. I am referring to photograph 13958 and we can see it in photograph 13952.

A. My Lord I agree that in 13952 there is clearly visible a label in that box but if we look at Doc.D and photograph 13933 we have an identical box but not the same box which does not bear that label. Some of these boxes were fitted with the label and some were not. One must be guided by tables in the current capacity of fuse wires without having to look on every box.

Q. Mr Sharples in photograph 13933 you would not say that whatever was there have been burnt off would you?

A. I would not.

Q. But if there was the manufacturer's label would it not be the thing for the authority to stick to the manufacturers' recommendation.

A. Not necessarily my Lord I do not know whether this particular box was used by the plaintiffs as the label. I don't think so my Lord.

Q. Mr Sharples doesn't the fusing current of a wire increase when the thermal capacity of the fuse holder is greater?

A. I think it will my Lord.

Q. Now Mr Sharples whatever you think of the likely load I think you will agree that one should never overfuse above the level recommended as maximum by the manufacturer, you agree with that?

A. Yes my Lord.

Q. Is not one inviting overheating by sustained excess current if one still overfuses above that level?

A. One is making possible for sustained excess current to flow.

Q. This is a matter which you should be obvious to every professional engineer?

A. Yes my Lord.

Q. And a professional engineer who would have access let's say the case to the Faults Log Book should have seen that there was something wrong when he would have seen the various blowings of the wires?

A. We have seen on one sheet of paper the extracts from this log book which in fact covered many many pages. If this book was scrutinized by a professional engineer everyday he might have noticed that certain fuses were blowing very frequently and he might indeed have made inquiries.

Q. Should have started to notice them?

A. Yes, I think a trained professional engineer would have done so.

Q. Jumping now to something else I think you will agree with Mr Woodcock that the CEB should not have failed to bound the sheath and armouring to the neutral?

A. I certainly agree.

Q. Its common ground on the state of the evidence that the situation which has been depicted by Mr Woodcock is as was in 1972?

A. Yes my Lord.

Q. And you agree with Mr Woodcock and with Mr Turner as to the risks that this situation creates?

A. Particularly the risk to life my Lord.

Q. Particularly but also of the risk you said particularly so there are other risks?

A. There are other risks of minor character, the great danger was the risk to life.

Q. The great danger is the risk to life but there is the other risk of what?

A. It does low current arcing in the holes at the top of the box.

Q. With the result that we know?

A. No I don't agree with that part.

Q. With what possible consequences?

A. If there was already established that there were overheating and that low current arcing occurred it could accelerate the deterioration of the insulation and again under certain circumstances it could have ignited the PVC at the point of arcing. I described this yesterday as burning the PVC between the limited radius I said from the radius of perhaps 50 cents piece.

Q. We should now switch on to the potential load Mr Sharples, when you say at page 3 paragraph 3.4. the potential load is the maximum load and you go on, do you mean that this load is the most that one would expect?

A. That may reasonably be expected.

Q. Do you mean also after applying the various diversity factors you would eventually arrive at the maximum load for only a transformer to supply the demands of a factory complex such as the one which Bata Warehouse was situated?

A. Yes.

Q. Now you are surely aware of a British Standard for the loading of Oil Immersed Transformers?

A. I cannot quote there is some doubt of such a British Standard.

Q. Relating to the effects of overloading of transformers?

A. No doubt.

Q. Presumably this would enable one to select the transformer which can accept fluctuation for various duration of time?

A. My Lord after arriving in Mauritius I telex a colleague who used to work in the Electricity Board in England and I put to him the problem of the supply of electricity to a new factory estate comprising some 40 installations of a total, an aggregate installed capacity of 850 kw. I asked what size of transformer they would fit into the sub-station supplies in the estate. The answer to that was that they would expect a load rather in excess of the rated capacity of the nearest transformer 300 kw size. He remarked that this transformer could carry a sustained overload of 390 kw but because they would expect close in this factory area they would have installed a 500 kw transformer. I have the telex in my bag my Lord if you wished to see it.

The conclusion is that even a line for further

growth in this factory estate they would have put a transformer of 500 kw in spite of the fact that the aggregate load was 850.

Q. But your friend Mr Sharples is not here for cross-examination on the advice of Mr Turner?

A. I am sorry my Lord I cannot produce witness.

Q. Mr Sharples after applying your various diversity factors you have in fact an average demand not a maximum demand?

A. No my Lord. Even after diversity demand which has nothing to do with the average demand it is the maximum demand to be expected from this collection of factories.

Q. What you mean about average demand, maximum demand and peak demand?

A. Let's start with the after diversity demand. This is the demand which might be expected from an installation or from a group of installations for the purpose of estimating the capacity of the transformer, the fuses everything they supply to the installation or the group of installations and is the demand which might be expected to be recorded on a meter which normally would record the number of kw hours used in an half hour and double that figure to give you the maximum demand measured every half hour period. Those are of small importance when calculating the size of the equipment necessary because they last at such a short time they do not cause overheating in the service facilities that is the after diversity demand which is commonly used precising everything right back to the power station.

Q. And between the maximum and the peak demand perhaps you might make the distinction?

A. I would also call it the peak demand, the maximum and the peak demand it is not a specifically exclusive momentary demand.

Q. In paragraph 3.7 of your report at page 4 you have referred to an approximate connected load of 500,000 kw and to a total generating capacity of 100,000 kw. I suppose that using your notation the overall diversity factor for Mauritius is 5?

A. I would guess so.

Q. Now if we turn immediately to page of your report we go to paragraph 3.17. where we

have that little schema we see at 6th column what you called installation diversity factor. Would that be an after diversity factor?

A. That is the factor which when applied to the installed load produces the after diversity demand in the 7th column, divide $\frac{125.9}{1.57}$ and you obtained 79.7.

Q. And you give this installation diversity factor as 1.57 and you give the group diversity factor as 1.30?

A. Yes I do.

Q. How do you arrive at the 1.30 Mr Sharples?

A. Judgment based on experience.

Q. If we consider then those diversity factors we find that the products of those two that is 1.57 x 1.30 for those 3 consumers we would get an overload diversity factor of 2.05 so that the total number of consumers on that meter cable was we know 7. Would you apply a further diversity factor because of the 4 others?

A. If I were working with the group of 7 I might increase the figure at 1.3 slightly. I would increase it slightly.

Q. So that your 2.05 will increase?

A. 2.1, 2.2.

Q. But you'll have to take account from the fact that it will be 7 and not 3 consumers?

A. Yes.

Q. Now if we enlarge the group from those 7, we enlarge it to the 3-figure tables for that transformer, we would then reach a number of consumers which is about 20. I think some figure has been given - 17, 20 you would then have to increase again your diversity factor so that it will be by that time reaching a figure of about how much?

A. 2.7, 2.8.

We are now getting to this situation that I telex to my colleague when they have access the diversity factor for this industrial group at 3.

Court: We had better not record anything which might have been in the telex. The person in question is not in Mauritius.

Q. Yes. So that we see therefore that from about 20 consumers out of the 100,000 consumers in Mauritius they are reaching a diversity factor of 3 and for the 100,000 we have a diversity of 5?

A. Perhaps more.

Q. Does that appear reasonable to you Mr Sharples?

A. Yes it appears quite reasonable.

Q. This would not bring you to say that your estimation of 1.30 as your group diversity factor is on the right side?

A. Other engineers of equal experience and equally able to make a judgment might put a figure lower or higher, this is very much an individual matter. All I can say is that it is certainly greater than 1 and 1.25.

Q. Now would you agree that any over-estimation of diversity will result in disconnection of supply by blowing of fuses?

A. I cannot agree to that as a general state no.

Q. Would over-estimation of diversity, would it not have any possible effect?

A. It depends on the degree of estimation.

Q. Well I mean substantial over-estimation, significant over-estimation?

A. If that 1.3 had been 1, then we would have 80 amps instead of 79.7 amps, instead of 61.3 but this would be very sufficient to blow a single 18 fuse wire which over-rated at 45 amps fusing current which is of the order of 90 which is above the 80. In the course of time that 80 might have caused the fuse to blow.

Q. And the strengthening of the fuses would also lead to the components being damaged?

A. The strengthening of the fuses in itself make no damage but it would make it possible which in turn caused the damage.

Q. We come Mr Sharples to page 5 of your report paragraph 3.10. We have the Imprimerie Ideale, the application and the permission and installation and so on all contemplated the full load of all the articles that had been mentioned in their application form obviously.

The application form and Mr Jean's subsequent reckoning of it would have taken into account all the equipment mentioned in the application form.

A. I have not got the total. It would apply diversity, all those appliances would be in use at full power that is the whole meaning of diversity.

Q. At 3.12 you said you visited Textile Industries, how many times did you visit Textile Industries? You said you visited in the morning of 13th February?

A. Yes, in fact I visited on my previous stay in Mauritius in 1972 1973 and then on this occasion I visited it once.

Q. How long?

A. Approximately an hour, 3/4 of an hour.

Q. And during that 3/4 of hour you visited the whole of Textile Industries?

A. No my Lord, I visited a cutting room, sewing machine room and an iron room, the main sub-station within the building and the office.

Q. We come now at page 6 of your report paragraph 3.16. you referred in this paragraph to the year 1974 as being as one of the best years for Textile Industries.

A. In that sense I was looking at the records of consumption which are attached and I noted that during that year they had a number of occasions reach figures in excess of 200 kva demand whereas in subsequent years the figures seem to fall off and I was informed that in 1974 they have had cancellation of certain orders from the USA and they never really recovered their trade since then.

Q. In 1974 they would have been in full production?

A. With what they had in store I think they were in full production.

Q. And a well-developed factory at the time?

A. Yes it would appear.

Q. Therefore we have given you since yesterday a little sort of graph that we have tried to prepare of the information that the defence has put in showing for the months of May, June and July showing the period of rapid expansion up to January 1974 and then from January 1974 according to the figures put in by the defence, showing a period of stable production with very slight growth up to 1976 and after that towards 1976. Would you say that that represents a fair representation of all the figures put in by the defence?

A. No my Lord, it doesn't. It is not a fair representation. There are several peculiarities about this. To begin with in MAY we see that Textile Industries is showing here as having 20 kw installed in fact they applied for and received connection of 20 for 18,000 or 19,350 in June so that the figure shown as May

should be shown as June. June here shows that figure being increased to slightly under 40 kw. They applied for a further 20 kw towards the end of June, permission to connect was not given and therefore connection was not in fact made of that additional load until after the permanent arrangements were effect in July, so these two are incorrect.

Q. When you come to your figure of January 1974, is that correct?

A. This is correct. In January 1974 they were given permission to increase the load to 403 and again in 1976 they were given a further permission to make a further increase in plan but it is not a period of stable production because one finds when looking at the actual demands incurred that from the beginning of 1975 demands decline although they had put more plan in training the staff and does not make use of it, it would be incorrect to say that the period of rapid expansion was covered by a period of stable production with slight growth. On the contrary it appears as far as the consumption of electricity and output from the factory it declined. This is the reason why in 1974 is a good year because chosing good year gave the lowest diversity factor, had I used the biggest for 1975 I would have much higher diversity factors than the figures of 3 months. I have made a very fair choice.

Q. In June 1972 Textile was at the commencement of a rapid growth?

A. Yes.

Q. And you would use a diversity factor that would be applicable in 1974 to that situation?

A. I used it as a check on my judgment. I chose 3. I then visited the factory, I turned up a record as a verification of my judgment. My visit to the factory produced to me some of the astonishing figure of 5. I then turned up the record and find that my choice of 3 is much nearer the indication I received on that particular visit.

Q. At page 7 of your report paragraph 3.20 you see in hindsight the actual demand of a consumer or group of consumers may be verified by reference to the energy (kw hours) actually consumed over a recent period and the number of working hours during that period. Do we take then Mr Sharples that in your opinion this is now an actual method of determining the load after the event?

A. No my Lord. It is not an actual method far from it it was suggested that Mr Davidson's memorandum and it does show in hindsight what appears to the cabin in the previous month. There are so many assumptions that I would not regard it at all as an accurate one, the assumed number of hours worked is a guess and I have actually checked each factory, the number of kw hours consumed depend on the interval between the reading of the meters there may be 2 or 3 days shorter in one month consequently two or three days longer. I don't place a great deal of reliance on this particular month and it is only in the hindsight and therefore it is now used for casting what you should have put in to suppliers/consumers last month.

Q. Mr Sharples there is something I honestly don't understand. In paragraph 3.21 the average load of the 3 consumers for the month of June 1972, based on the actual consumption of each during that month and number of working hours, namely, 200 (a figure suggested by Mr Davidson in evidence). Therefore you are now dealing as much as possible with actual figures.

Now during those 3 consumers so far as we know were all working more or less the same hours, there is no question of working some during one night or working during the days. How is it then that the actual consumption having as far as we can say, actual hours you have thereafter to apply a further diversity factor which you mentioned at 3.22. This I can't understand.

A. Yes I must admit to an error here. That the application of the diversity factor in 3.22 should in fact have been done after the conversion of the averages into a maximum by the application of a further 15%. An average is an average and therefore one would expect at times to be lower and at times to be higher and it is in those times when the loads are higher which is diversed. We would in fact arrive at a precise and same figure of 45.4.

Q. At 3.21. you have given us for only the month of June 1972. That is so Mr Sharples?

A. Yes.

Q. But you have produced at the same time a certified copy of the meter reading for Textile Industries for the period February 1974 to July 1975.

A. Yes.

Q. Well let us look at the 12 months starting with

from February 1974

(Document RL produced)

This is a table of comparison of the average kw with actual kva. The 12 months February to January consumption kw hours plus the average kw the actual kva you use the same figure of 200 working hours per month to arrive at the average kw. Then in order to compare the average kw to the actual kva we have divided the former by the latter. When we look at this variation the average kw with the actual kva we see a very considerable variation. For October .449 and for January 1.002 if we added those 12 figures on the complete extreme right and we divide by twelve to make an average we reach a mean of .645 and in fact when we look at the monthly consumption January is more than double of October. Do you make anything of all that Mr Sharples?

A. I make first of all the observation that this figure of .645 if applied to my own figure for Textile Industries in paragraph 3.21, 4th column the figure of 11.7 if I divide 117 by .645 I got 18.1 kva and converting kva into amps I get 26.1 amps which is remarkable confirmation of the figure of 26.4 which I obtain for June 1972 table 3.21 last column against Textile Industries. You find the figure 26.4 amps. Using this factor which is worked out for 1974/75 I got 26.1, so I am extremely happy.

But now as to the variations, these variations are occasioned no doubt by the incidence of public holidays which will of course affect the number of hours at which one will divide, reduce the number of working hours. It would be occasioned by a longer interval than one month obviously February to March contains only 28 days if the readings were taken on the 25th of each month whereas on some occasions again the incidence of public holidays throws back the date of meter reading. The meter readers don't work on public holidays so the gap between readings is increased. This means that there are more hours than the 200 and this cause the variations. I'm very puzzled by the last point because it shows more than one in other words the actual for those average kw were converted into kva with the power of .7, we'll get something lower 200 towards the actual was only 80. What happened then I really don't know but there are very strange figures emerging from this table that I can't interpret without studying them and looking

back at the calendar and going asking when there were public holidays.

Q. If you turn to page 6 paragraph 3.17 you've got your little scheme which shows the total for the last 2 columns installation of the diversity demand the aggregate 79.7 but for Textile Industries you have 15 amps. What I want to ask you Mr Sharples, don't you think that you should rely on the facts and acknowledged that Textile Industries were on occasion drawing more than 100 amps because it blew a strand of 18 SWG fuse wire in the Yorkshire fuse?

A. No I don't know.

Q. I know yesterday you have referred to that. Could you now answer that question?

A. Firstly, the table in 3.17 is the potential load and the figure which might reasonably be expected the purpose of this exercise was to see whether it was negligent of the CEB to have authorised the connection of that load. In my view it was not negligent. Now the question what load actually arose is a first stage separated from the expectations and in allegations to negligence. What actually happened? Using the hindsight here it would appear that Textile Industries had an average load of 26.4 table in paragraph 3.21. Applying this factor I might remark that Mr Davidson had also the figure. If I would say right there might have been a maximum demand of 15% greater that would mean bringing up to about 30 amps. Now it would certainly appear that after the Textile Industries had its own single 18 to blow that there must have been current which exceeds 19 amps not a 100 because this figure which I still maintained unless there had been deterioration of that fuse in the meantime in which case there may be that figure of 90 could have been perhaps 80. I can see that the blowing of that fuse. Textile Industries was alone on this Yorkshire fuse there must have been occasion when the current gives rise if perhaps only for a very short time sufficient time to blow a single 18.

Court: above 80?

A. Yes abovw 80 I think would be the minimum requirement in a reasonably short time.

Q. And this happen how many times Mr Sharples? We have the 16th, 27th, 28th, 1st and 4th plus of course the Yorkshire.

A. My Lord this is the very reason why these fuses existed. During that period Textile

Industries was putting in its machinery starting at the Factory extension is being made to the part and I will have an opinion that those short circuits causing the blowing of the fuses and prevented currents in excess of 80 to 90 amps from persisting. It is difficult at this rank to say why they blew but certainly as they did not really commence operations seriously we have been told by Mr Davidson that even in the middle of July they had only 40 sewing machines, it is unbelievable that 40 sewing machines could engender 80 amps, per phase.

Court: If the short circuits in the internal installation were due to new machines being started, would you expect their own fuses to blow rather than the external one - the Yorkshire?

A. It would depend on the value of those fuses my Lord and consumers have a habit of blowing their own fuses and putting a larger one until they finished up the fuse which is larger than the cut out fuse. This is a regrettable habit of consumers.

Q. Mr Sharples are you forgetting the evidence in this case, are you forgetting that all workmen have stated that various fuse wires had broken but had not melted away. Therefore suggesting that it was not a short circuit.

A. A short circuit can be of different natures. You have a short circuit between phases, you have a short circuit from phase to earth, a short circuit from phase to earth passes through a very fairly high earth resistance and its appearance as seen at fuse can be more or could be no more than that of overloading.

Q. Even if there is an inadequate earthing?

A. We are not talking of the earthing now of this cable my Lord, we are talking of the consumers earth which provide that is the earth point on the consumers premises which feeds the current to earth which eventually comes back at the transformer.

R E C E S S

Tuesday 14th March, 1978

Bata Shoe Co. & Anor v. The C.E.B.

AFTER RECESS

Mr David continues the cross-examination of Mr Sharples (still under oath)

Q. Mr Sharples, their Lordships pointed out to

you an installation to the exterior of Ford(?) building showing a loop of 3 cables; a loop tied round with wire. Do you have any observation to make?

A. What I just referred is similar to this. I think it confirms what I said this morning. This has been undone in order to take the wires and has been rebound in a casual manner. What I have just seen is just like this but it is not as bad as that, I do not know how long it has been there, but it shows no sign that it has suffered by fire.

Q. We shall come to another aspect and later on I shall come back to my normal trend of cross-examination. First of all I would like to ask you to look at the first sheet of paper I put in this morning showing the henley box and the cables. We have Cable X, the incoming cable, you have the little cable twin 7064 between Y and the metallic and a cable between the bi-metallic and this goes out, the outgoing cable. Which of these three cables would according to you Mr Sharples be most vulnerable to attack by fire?

A. It depends on the source of the fire.

Q. Let us take an hypothesis of fire from a source other than the electric installation in room 4?

A. I have the source of the fire where materials were stacked on the floor of room 4. Not necessarily immediately under the box but within say 2 feet of the cable marked X. This is sheathed with impregnated hessien service; then regarding most vulnerable to fire either in direct contact of it or radiated by fire.

Q. Let us say for instance there would be fire, say 2 feet away from the wall?

A. I said that a fire within 2 feet at that cable could ignite that cable.

Q. The flames would be going upwards?

A. Yes.

Q. Is it not a fact that fire detectors are placed near the ceiling because temperatures build up very rapidly to the ceiling downwards due to congestion?

A. Yes.

Q. Ignoring for the moment the 7064 PVC and going to the incoming cable on the one end and the aluminium PVC on the other. You maintain that in a fire even two feet from the

X cable the incoming cable, the cable would fail before the cable of aluminium PVC?

A. I said the fire two feet from the cable X could ignite that cable. I said I would expect that cable to be the most vulnerable one. As regards the up going cables their vulnerability to fire would depend on whether it was small fire or flaming, going up the ceiling also the distance between the horizontal part and the ceiling. They would be affected more by combustion if there is a gap of 2 or 3 feet.

Q. After hearing what the witnesses have said and from your appreciation of what may have happened, which of those two cables would go first from a fire, which would have started first, the one within 2 feet of the incoming cables; would it be the incoming cable or the aluminium PVC?

A. If it was a fire which burned close to the ground I would think cable X. It would fail by burning all its servings. This would then keep the steel wire armouring but not burn it through. It would melt the inner lead sheath (you see the letters LC) and then finally one comes to the paper insulation PI and that is impregnated with insulating oils which are combustible and one paper insulation would fail very rapidly and then get short circuit in that cable. I would imagine unless the flames would keep high that failure would occur but the cable would remain untouched by virtue of the steel wire armouring.

Q. We have been told that there were boxes which were piled one top of the other in that room. Would this be of any relevance of any significance in order for you to decide whether the flames would be going up or not?

A. They would of course add height to the flames but again I understand these cables between W and Z, one witness described going along the top of the dividing wall. They would shield it.

Q. We have evidence that the whole of that cable had melted away because the CEB has not been able to retain any part of the cable from the henley box?

A. There was aluminium, the inner core, it was insulated. Aluminium is low melting metal. We have seen from the photographs that the construction was done with

corrugated iron sheets and I would be astonished if the aluminium cable remained at all.

Q. Within what time in a fire which you can picture that had taken place on the 6th July 1972? Within what time would you expect the aluminium PVC would fail?

A. I cannot even make a guess.

Q. What about the incoming cable?

A. It would not go in minutes if there were not materials burning. It suffered from radiation. There were materials under the box, so it could be by radiation.

Court: Before destroying the cable, how long would it take to cause a short circuit?

A. Up to half an hour.

Mr David: You say that the incoming cable would take up to half hour to feel the fire; so far as the aluminium PVC is concerned you would not even guess. You would agree at least that it would be within shorter time?

A. No, I could not agree nor could I deny it. It depends so much on the nature of the fire.

Q. Mr Maisei* put in a graph showing the time taken to reach various temperatures, great fire, moderate fire and he suggested the Bata fire has been of moderate type. Would you agree to that? *sic

A. I recall that the passage in Meyasei's* evidence. I cannot comment whether it was moderate. *sic

Q. Mr Meyseai* stated that in the severe case 500 degrees is reached in five minutes and in the less severe cases in 20 minutes would you dispute that or would you agree? *sic

A. I must agree to an expert's views, but I do not know where those temperatures occur. Are they on the site of the fire, are they five yards away or 20 feet away. I just do not know. I am not qualified to comment.

Q. I am giving you the opportunity of making any comment thereon if you have. Between 250 and 500 degrees centigrade will the conductors move together within seconds. I am talking about the conductors that are coming from the ceiling downwards?

A. I do not see why they should move together any more they move apart.

Q. But they could move together?

A. They were already bound. I cannot see how they can move closer.

Q. They would move together or closer away?

A. If bound together they cannot move closer together.

Q. By that time of course the PVC would have softened; we have heard that from Mr Woodcock; it comes to something like the chewing gum. Would it not be reasonable Mr Sharples to suggest that being given the way in which it is fixed the PVC insulation would be likely to fail at point W because of the bend?

A. I have no idea of the bend. I cannot speculate on that. The heat is going to be different along the length, either it may be hotter at W or between or at the end. The bend is not acute.

Q. If the court accepts Mr Meysei*'s figures, would you agree that the PVC insulation would fail within 5 minutes in a severe fire or 20 minutes in a moderate fire. If the court is prepared to accept Mr Meysei's figures?

*sic

A. I am still not clear what Mr Meysei*'s figures apply to. It may be different, very different part of the room depending on the materials burning there. If we have no material here, in the part where no material is stacked, it will be cooler. I do not know what is under W and Z.

*sic

Q. It was a relatively small room, it was a closed room; remembering what you have suggested about the fire, remembering what you have accepted in relation to congestion, the fire being two feet away of the henley unit?

A. I did not suggest that.

Q. When I say suggest I mean what you took into consideration, assuming all that Mr Sharples, are you not in a position to agree that provided Mr Meysei's* figures are accepted the PVC insulation would fail within 5 minutes?

*sic

A. I am not in a position to agree nor to contest that.

Q. At the time the PVC aluminium would fail, at that time obviously the supplies downwards would be cut off?

A. One by one, phase by phase. We have six conductors. They would not fail simultaneously. They would fail one by one and progressively. One phase would be lost and one group of consumer Textile Industries, and Ideal Printing another phase would fail;

positively affecting Diamond Co. only and the second phase would go finally the lot would go.

Q. The cables would normally be subjected to the same amount of heat?

A. But one would go before another.

Q. Would that lapse of time be great or would it just be like that. I am prepared to concede not simultaneously?

A. It would not be long, possibly 3, 4 minutes.

Q. We are talking about the outgoing cables, the aluminium cables, you will not put forward any time limit within which they could go. In respect of the incoming cables you have put a figure of about 30 minutes?

A. Up to 30 minutes.

Q. In fact we have some evidence that Mauritius Threads complained on the 6th July, at 1.45 p.m. that there was fire on line. Maurithread works is one of the consumers up stream?

A. On this particular cable.

Q. I do not mean one of the 3 consumers downwards but upstairs.

A. Is it on the same cable.

Court: It is before Bata?

Mr David: On the transformer?

A. The fire on line does not convey anything to me.

Mr David: I invite Your Lordships' attention to Mr Davidson's report, it is the first section, we shall see Mauritius Threads Works.

Q. Will you confirm this Mr Sharples, is that correct?

A. I see it.

Q. There is an entry in the CEB log book that at a quarter to two Mauritius Threads Works reported to the CEB that there was fire on line and that is when Mr Hugget was given instructions?

A. Not necessary at all, somebody phoned Mr Hugget at 13.45 it is not said that it is the first.

Q. The entry "Mauritius Threads Works, Plaine Lauzun, fire on line 13.45" the workmen set out at 14.45 and returned at 15.10 and the entry continues "phoned Mr Hugget at 14.45"?

A. That is the entry.

Q. Workmen sent on site Agathe, Jupin Doomun. You say that this does not show that that is the first time that Mr Hugget heard about the fire?

A. It is not necessarily the first. I understand that it is common when the Fire Brigade receives a call, as soon as they receive the call about fire, they would notify the electricity board saying that there is fire at such and such location. This is an ordinary safety measure so that electricity men may proceed to the fire and disconnect electricity supplies. If the Fire Brigade is notified before half past one, the moment has been precisely recorded, the electricity board would have received the call either from the Fire Brigade or a call at the same time.

Q. You would have expected an entry in the board's book?

A. Not necessarily. Reports of a fire are not necessarily electrical faults, but fire caused by any source would be recorded by the electricity board because electricity cables are a menace to firemen.

Q. Would you say that this entry at 13.45 from Mauritius Threads Works would indicate that the transformer supply had by then failed?

A. I would not say that that follows from the entry.

Q. Let us now go back to where we left off this morning. When we left off this morning Mr Sharples, to a question by me you were referring to the possibility that the yorkshire fuses would have blown not through an overload but on earth fault currents. Do I understand you rightly?

A. The question was put to me because in the course of evidence the CEB employees had said that the fuses had melted rather than blown and this gives an indication of overload conditions rather than short circuit. I then pointed out that a short circuit to earth as distinct between phase to phase, the value of the current flowing is limited by the earth loop resistence and this is notoriously high in Mauritius. Therefore, the earth fault current would appear as seen by the fuse as of the same order of magnitude as an overload specially if they were simply added to the existing load currents. In Textile Industries all the machineries I think without exception was single phase load, lighting the motors, they were of single phase; it would be impossible in such a condition for a phase to phase fault to occur when the workmen were installing that part, it would not necessarily be a fault of one phase to earth and

the value of that fault would necessarily be low. Sufficient either of its own accord to melt and not disrupt the fuse or to do so when added to the load already flowing. They cannot be an explosive short circuit. It was looked as though it was an ordinary overload.

Q. Do you know what was the consumers' earth fault resistence?

A. I have no idea.

Q. Would you go along with me if I assume that it had the same value as that of the supply authority, i.e. 9 ohms?

A. I agree that at the transformer the value would be the same, but we have to add the earth resistence at the point of the consumer's earth. It takes 2 points to complete one at the consumer's premises and one at the transformer and one at the transformer would be, as said by Mr Woodcock, the one at the consumer, undetermined and undeterminable at this stage, but it must have had some resistence.

Q. The total earth loop, earth resistence neglecting the conductor would be 9 ohms plus 9 ohms is 18 ohms?

A. At the transformer certainly 9 ohms; where the other 9 ohms come from I have no idea.

Q. If we assume that the value of the earth electrode at the consumers was the same as the supply authority, that is 9 ohms, would you agree then that the total loop fault resistence, neglecting the conductor, the fault itself would be 9 + 9 = 18 ohms?

A. If it is assumed that the consumers' earth resistence is 9, one could assume that would be 9 + 9.

Q. Now 230 divided by 18 would give us a current of 12.8 amps?

A. Yes, it is correct.

Q If such a current blows a fuse of 18 SWG?

A. If added to normal current, the ordinary load current of let us say 60 amps. or whichever the figure was plus 18, it is approaching the blowing value of a single 18 fuse.

Q. Which is?

A. It is approaching. If that earth resistence is then 9 ohms, they would naturally surpass it. We are assuming 9 ohms. We could assume 5 or 6.

Q. You do not for one moment accept that there must have been an actual demand of 100 or more

that must have taken place to blow the fuse of Textile?

A. I said 18 amps or more.

Q. For the reason that you rely on 45 amps. instead of 50?

A. Yes.

Q. If you bear with me Mr Sharples and the manufacturers, would be prepared to go along to 102 amps, if you were not to discard the manufacturer's recommendation?

A. The manufacturer of henley box has no relationship whatsoever to the manufacturer of the yorkshire fuse or fuse wire which is inserted in the yorkshire fuse. I do not know what the manufacturer of yorkshire fuse quoted. It has no relationship with what appears in the henley box.

Q. You have seen this?

A. Yes.

Q. Could you say what is on the lid?

A. It says 50 amps. It means the capacity of this particular appliance, the rating of it is 50 amps.

Q. You have evidence that it was wired with 1/18 SWG?

A. Indeed, but I do not co-relate with the wire put in with what is stamped here. It carries sometimes a single 18.

Q. Can you suggest a reason why the manufacturer has got to put on that yorkshire fuse?

A. It is an indication of the capacity of that particular design of the fuse box. An indication to the user that it should not be fused to such a point which would allow currents in excess of 50 amps to pass through that box.

Q. If one uses 1/18 SWG wire, it seems that one is making it?

A. One is within the capacity.

Q. You said just now when you were adding up, you mentioned the average demand for Textile has been how much?

A. I have a figure in table 3-17 of 15 amps.

Q. You said just now that one would be approaching the blowing value of the fuse, which would be?

A. I have stated 80 amps.

Q. To approach 80 amps by adding something like 12.5 amps. We have to get 67.5 from somewhere?

A. Yes.

Q. Where do you get it from?

A. The figures stated from an assumed value of 9 ohms. I felt that and I do not get the 80 amps.

Court: If your earlier figures are correct, you cannot accept the value of 9 ohms at the consumer's home?

A. No, if my 15amps. was the expected demand; it was the anticipated figure. If to that we only have 12 or 13 amps, then we do not approach the point where the fuse would blow. If on the other hand the consumer's earth would be of a lower value we would then get a higher value.

Mr David: Those fuses blew?

A. They blew on overload which could have arisen from the normal load plus an earth fault current of the value which we cannot determine because we do not know the value of the earth loop.

Q. How do you explain that overload and to what is it due and to what extent is it?

A. It is partially made up of the normal current and partially made up of the possible earth fault current. Witnesses have said that only 40 machines were operating. With 40 machines we cannot have a very large consumption.

Q. On the evidence which we have those fuses did not blow?

A. We must have had a very low earth loop resistence. The authorities made no attempt to earth their box.

Q. The earth at the transformer was good?

A. Not particularly; when we measured it it was 9 ohms.

Q. If again you will go along with me, if you accept my figure of 100 amps. or more required to blow a yorkshire fuse and you add to it the Southern Cross and Imprimerie Ideale, you can go immediately to your page 6; we have 23.8 and 40.9 for Southern Cross and Imprimerie Ideale. To that even if we were to add your group diversity factor which you say would have been added in a different way but with the same result?

A. I did not refer to the table at 3-17. My comments regarding the application of diversity factor was in respect of paragraph 3-22; this would have been after 3-24.

Q. Would we have to do anything to the 64?

A. If the current was 100 and we have 64, we have a total of 164, we have to divide by 1.3

Q. Do you think that the 64 would be divided by 1.3, it is a hard practice 100, if you go with me. We reach 64.7?

A. The calculation is not being done correctly. We cannot have group diversity until we have the group. The 100 may not occur at the same time at 23.8; we must add the three together and then divide by the group diversity.

Q. I see your difficulty. But I am assuming for the purpose of my cross-examination, it will be for the court finally to decide whether they accept my submission of 100 amps.or not; but for the sake of argument if you are prepared to say that 100 amps. was the value at which the fuse blew, then in order to know what would be the current at that time flowing I suggest, in my ignorance very humbly, that we could not proceed to use a diversity factor in relation to the aggregate, but we have to do some other perhaps corrected arithmetic?

A. It is now clearer. At the instant the fuse blew there might be at the same moment a load at Southern Cross of 28.8 plus 45.9 at Imprimerie Ideale. The same diversity factor would be applied, let us say 1.25.

Q. Which would give us 52.6; that would make a total of 152.6 I shall not ask you to comment on that unless there is a comment you would like to make yourself?

A. You are suggesting that the load on the henley box at that time would be 152.6. It would be sufficient to do full damage to that henley box because the 100 amps. is removed by the flowing of the yorkshire fuse and the load could drop, by dividing 64 by 1.25

Q. But the very fact that the fuse would have blown no damage would be done?

A. That is why the fuses are for

Court: What about the second, before the fuse blew?

A. There would be a total current in the henley box for one second. But in that time there is no sufficient time either to blow a fuse in the henley box or to earth the cable because the earthing of those cables requires an appreciably long time; it has

to be sustained overload current. We do not know how long this current of 100 amps. which I am assuming, has been flowing.

Mr David: It would take as long as four hours?

A. No, probably less than that. Our tests show that the high temperatures at 150 amps would be a matter of minutes.

Q. We are talking of 100 in the yorkshire fuse?

A. I have no idea where the 100 arises from. I was told to assume.

Q. If it is 100 amps, whether the fuse would take four hours to blow or take less?

A. If it is 100 amps on 1/18, it would blow very fast indeed, 2 or 3 seconds.

Q. You are telling the court that it would blow very quickly and it would take 2 or 3 seconds?

A. Seconds or 2 or 3 minutes. 100 amps to a fuse which carried 45 continuously which would flow at 90, it is now carrying 100, it would blow in a very short time indeed.

Q. We come to page 9 of your report (H) where you take Mr Davidson's figures. I am to ask you a specific question relating to this. The question reads as follows: 4 amps added to a persistent current which softens(?) the insulation may not cause the fuse to blow, but if there was a 4 amp arch to the conductor in a localised spot, would not that produce additional localised heat?

A. It would.

Q. 3-27(b) when you say that in actual fact the maximum load imposed on the box would not have exceeded 45 amps that is a matter of your opinion?

A. Yes.

Q. In fact you were there, the fuses were there?

A. It is my opinion, it is for the choice of words.

Q. Fuses were there, there were witnesses of the incident and they blew on several occasions. Would you not agree that in a condition near the blowing of a yorkshire fuse currents considerably in excess of what you term maximum load will pass for a time?

A. Yes my Lord.

Q. In fact in your statement at paragraph 3-27(b) were correct, then the one No.18 SWG wire rated at 50 amps. should never have blown?

A. It should not have blown under ordinary load. It would have blown under conditions which I believe I have stated in 3-28, conditions of short term overload caused by yorkshire.

Q. Paragraph 3-28 page 9(a). You say following the connection of Textile on 1st June the three phases each with 1/18 must be regarded as being under fused, therefore wires commence to oxidize. I am glad to see unlike Mr Woodcock you have heard of wires being oxidized, and develop: conditions which might be described as groggy as fatigue. Is it not a fact that a fuse which never oxidizes its rated current by more than a small margin does not deteriorate?

A. That is so.

Q. When you say the fuse wire groggy of fatigue, this means that in order to be deteriorating this way, they may be repeatedly heated up for extended period and temperatures near the melting point?

A. No, my Lord, but for extended periods. It is heated, but not for extended periods.

Q. The temperatures near the melting point, for short periods?

A. It depends how often it is repeated. It requires in total a great lot of time. If the additional current between 45 and 80 to 90 passes there. If they approach 85 then the excess current is considerable; we have to square it. If this is repeated 2 or 3 times a day, by the starting of a press motor through the striking of a welding set, that would be repeated frequently, therefore we do not need to have a long period of overload.

Q. Can we escape the fact that there were repeated overloads before the fuse blew?

A. I cannot escape that fact.

Q. If we go to 3-28(c). Between 28th June 1972 and 6th July each of the three blew in turn. You say demonstrating that at the henley box the loads on the three fuses were reasonably well balanced that up to 5th July 1972, a load of the order of 80 to 100 has persisted for a time at least sufficient to blow the fuse, i.e. in some seconds. If the fuse is at its minimum fusing current, do you not agree that it can take hours to blow and not seconds. I understand that minimum fusing current is defined as the current which will blow it in about four hours; is that so?

A. May I put it defined in multiple of rated current.

Q. I am told that it depends on the assessed rating current of the manufacturer?

A. At what multiple of that assessed rated current to give a minimum fuse current. If I have a fuse rated at 45 amps. the single 18, the fusing current as defined in books of reference for these rewirable fuses, it means twice 45, at that it will blow. A that value of 90 amps, it will blow in a reasonably sort time possibly 2 or 3 seconds, possibly as long as 2 or 3 minutes. At that current I would consider it will blow earlier than four hours. In the case of ERA at 160 amps, which is twice the rated current it blew in 3 minutes. In our test we blew the same fuse in 60 minutes. We are talking in terms of minutes and I maintain even seconds. It would be considerably lower than twice its value.

Q. That would be the minimum fusing current?

A. It is almost undefinable in such an unprecisable subject.

Q. In fact in order to ensure that a fuse blows in less than one minute, I am given to understand that three times rated current must flow; is that correct. Regulation D-22 reads as follows :

> "Earth leakage protection may be afforded by means..... the current rating in semi enclosed fuse."

A. That does not mean that earth takes three times the rated value of fuses to blow it in less than one minute.

Q. What is the reason for that regulation?

A. It concerns appliances as giving it a short circuit earth.The earth fault current flowing well below, to take the protective device. If you cannot give a good earth. It is a regulation which applies to consumers' premises and not to public electric supply.

Q. You do not accept that in order to ensure that a fuse blows in less than a minute, three times rated current must flow?

A. I do not accept.

Q. You do not accept that that is the meaning of Regulation D-22 of the 1966 edition?

A. No.

Q. At page 4 of the ERA report in respect of table 2 showing the maximum temperature etc.

in the third column we see that at 90 amps it blows it in 45 minutes?

A. Yes.

Q. The next column shows at 100 amps it blew within 2 minutes after the 45. Then it goes on to the 100?

A. I assume that is what happened, it does not say so in the report.

Q. First of all did you not see in Mr Turner's report that it takes 90 amps and 45 minutes to blow 1/18. When the current was increased to X in respect to the 17 SWG it would have a blowing time ranging from a few minutes to a few hours at 122 amps?

A. We did not use the 17 SWG wire in the ASTA report.

Q. You concluded at page 2 of your supplement report "Three single..... were reasonably cooling". Of course, we know that one of them had been over wired in the meantime. Could the fact that each in turn blew could this not be accounted for that the load was not balanced properly but was continuously increasing?

A. That could be another reason.

Q. At 3 you say that it has been established that such loads only momentarily exceed 61 amps. I have to ask you to define momentarily and whether in the light of what has been said here on this it could not mean several hours?

A. By momentarily I mean such work as proposed to be done by a welder; the work that he was doing, that time employed in the work which is not done continuously. It was being done to cut lexicon shelves material and such other works as joining the horizontal to the vertical by welding. First to cut then to weld; this may take 10 to 15 seconds. That would be the maximum I would say and that is what I mean by momentarily. The minimum would be just the starting of the 10 HP motor. Some time it could raise to 10 times its full load in a fraction of a second. By momentary it could mean from the fraction of a second up to 10 to 15 seconds.

Q. Paragraph 4-2, small and extremely dubious. Could these result from intermitent contact at 4 amps, one phase at a time?

A. Yes, they could result.

Q. Paragraph 4-3 page 10. You have expressed an opinion, you mention the short circuit

which would blow the fuse. I am advised that you have given no consideration to the other alternative of a neutral in the box, the arch returns by the contact with the base at earth fault?

A. I have not given any consideration because it seems to me that it is extremely an unlikely possibility.

Q. But possible?

A. It is possible when it is flowing around inside the box which was in close proximity to the metal inside the box, if that wire was attached to the neutral and if the neutral was displaced in the sense that its voltage rises to that of a phase conductor, then it might be. It is rather an unusual feature occurring simultaneously, it is not impossible one could imagine.

Q. Would that give a significance to the fact that this is near the place where the box lid was, let us say, cut. Would that be of any significance?

A. I agree that the part of the door which broke away is opposite to where the neutral terminals are. Therefore an arch, if such arch existed, would probably spring either from the right hand phase which is always equally closed or from the neutral. But to have sprung from the neutral seems very curious circumstances would have happened.

Q. Paragraph 4-5. When you say "I have calculated the current..... the temperature of the box to 300 degrees centigrade". I am going to put a slightly long question. Do you not think it really unlikely that a three phase fault would occur of the type you have simulated in the ASTA test which would require two things (1) the simultaneous connection of all three outgoing wires to the case within 100th of a second; (2) perfect clean contact with the top of the box?

A. I agree that it is unlikely that one would get the maximum fault current that we can calculate, it would probably be of a lower value, almost certainly of a lower value. But if it was at a lower value then the destructive effect of that arch would be reduced in proportion to the circumstances of the balanced current and the time it would persist would be longer and the destructive effect would be less.

Q. You would agree that the simultaniety of those two conditions the present of those two conditions would be almost impossible?

A. It is imaginable but unlikely.

Q. In paragraph 4-6 you say that you have "measured the earth loop resistence of the box.....the vapours". I am advised that the danger which was contemplated of the 4 amp arch is not to the door but to the load on the conductor before exit fault. Would that affect your opinion?

A. I am referring here to an arch to earth on the door. If we have now to consider an arch from some other point to the door then this is a matter which I have not yet considered.

Q. I would ask you to consider the four arch amperes to the spot on the conductor by the exit fault?

A. An arch of 4 amps. to the exit fault is not going to affect the door at all. But that paragraph does not refer to an arch of 4 amps. I might say that my reference to an arch of 4 amps to the exit door is dealt with in one of the supplementary paragraphs to section 4. Paragraph 4-14 deals with arch of 4 amps to exit door.

Q. Paragraph 4-8, page 10. "Over heating of the fuse carrier..... paragraph 4-1 and 4-4 above"; I am advised that shorter archs of this kind regularly occur in switching contacts and remain rooted before amps arch would dwell at the exit fault. Would you agree?

A. Yes, I must agree with that statement. It has no relevance to 4-8, but I agree.

Q. Paragraphs 4-10 and 4-13 "The processes leading to a condition.....as they are not exposed to air". I am requested to refer you to apparently a well known research by Dr Williamson on this effect producing failure of electrical connectors. Some running. I am informed that it can be very rapid?

A. I am afraid, I do not know the work which learned counsel is quoting. I do not know what Dr. Williamson means by fairly re-acted whether he is referring to seconds, minutes or hours.

Q. Do you remember when Mr Turner deponed, he gave his explanation of the crushing and he spoke of two surfaces about electric contact. He said that the points of contact are the high points on the surface crushed together by the contact force; the remaining space is filled with air. This is very small, but it requires only a few molecules of oxide twist to affect the electric contact

and is sufficient to take effect. This oxidization is greatly accelerated by rising temperature and Mr Turner says that this is shown by well known research publication by Dr Williamson in the field of electrical connectors?

A. I would not like to dispute Dr Williamson on this point. My point in this paragraph is that every time one inserts the fuse carrier into the fuse base there is an action which removes oxidation which may have occurred previously.

Court: Do you agree that there is not absolutely any possibility of air between the contacts?

A. By virtue of the fact that they are in contact they cannot have air between. But looking under high magnitude, in those spaces there must be oxidation, but where actual contacts are made there would be no oxidation.

Mr. David: In paragraph 4-10 you say that there could have been no such overloading, but you have agreed by now that it is not correct to say that there was no overloading before the fitting of the 2/18 SWG wires. There was overloading but which was successfully disconnected?

A. It was in my opinion that throughout overload. When I said this overloading I referred to overloading sufficient to cause damage.

Q. Would you as an electrical engineer advise, when a fuse repeatedly blows, the proper course of action is to double the thickness of the wire?

A. No.

At this stage the case is adjourned to to-morrow Wednesday 15th March, 1978 for continuation

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Wednesday 15 March 1978 at 10.00 a.m. — 15th March 1978

Before the Honourable M.Rault, Ag Chief Justice
Honourable P. de Ravel, Judge.

Mr John Sharples Xed by Mr M.David, Q.C.

Q. Mr Sharples, yesterday afternoon I was passing on to your supplement that's the new paragraph 4.14. I should like to go directly to 4.15 when such contact has occurred, it is averred by Mr Turner an arc

with a current of about 3.77 amps would strike and continue. Even at this value, local heating of the conductor and its surrounding insulation would be intense, sufficient to ignite the PVC which would flow, still in firce, over the end of the box whence pieces of flaming PVC could drop on to inflammable materials. Mr Sharples have you had the opporunity of engaging in or witnessing any test?

A. I have not witnessed the test. I have seen the results of test on the box which were subjected to test yesterday while the Court was in session.

Q. Have you examined the box and are you sufficiently aware of the experiment?

Court: Was the test carried out by the experts of the defence or by the expert of

Mr David: I would say by the defence.

A. My Lord I didn't watch the test, I have only seen the results and if I were to say that certain current passed I did not see myself the CEB instruments. I believe the experts of the plaintiff did visit the CEB laboratories in the course of the test and would make observations.

Q. I understand that my friends for the defence will be leading evidence as to the test that was done, carried out the test, so perhaps I shall leave this for the moment if it becomes necessary after then I might put one or two questions to the witness.

Do I understand you that this mechanism would ignite the PVC but that it would be only over an area of what you have called of 50 centimes, 50 cents?

A. My Lord I don't agree that it would necessarily ignite the PVC. Paragraph 14 is what I understand Mr Turner's theory to be, should fire be caused then I considered that the area of burning would be very limited in the manner I described.

Q. It would be very limited and it could not spread whatever the amount of heating of the material?

A. Not in my opinion.

Q. We come to 4.16 here again you discount sustained overloading but you agree if it is demonstrated to occur that insulation softened will occur?

A. I do agree.

Q. 4.17 here again you say it would ignite but it would probably extinguish?

A. That is what I say.

Q. But what would happen if it did not extinguush?

A. If it didn't extinguish then the spread of the burning would be upwards and as progress were made towards the bi-metallic connectors the PVC would have been on fire would turn to a form of ash which will be very carbonic to the touch but I would not see the conflagration. I would see a progress of the point of burning upwards. It is not a highly inflammable material, it continued burning, requires it to be in an ambient temperature in excess of 400°, of course immediately above the flame the temperature would probably be about 100° and therefore the flame below would support the continuing combustion above. Whether any draft at all where they could go out but in this particular side I don't think there would be any graph and it would get a progressive burning upwards leaving an ash behind. I think the progress would be upwards and not downwards. Again it is a poor theory but you have asked my opinion.

Q. In the last sub-paragraph of paragraph 4.17 you say: In my opinion the dissipation of the heat from the arc over this short distance will prevent the sustaining and spread of any burning which might arise at the point of contact.

A. Yes my Lord this is based on the fact that it's essentially a kw of heat applied at a very small point, it is not spread over the length of the cable. It is at the point of arcing, the heat at that point will be conducted up to copper cause towards upwards and downwards and make a point of contact and the area over which heat remains sufficient the burning of PVC will be very small.

Q. Your opinion depends on the extent of the pre-heating of the insulation?

A. Hardly because the pre-heating is only sufficient because it's softening and melting of the cable, the ignition of a high temperature is supplied by arc at a point of the arcing is very high indeed by comparison with the pre-heating. I would regard once the arc has started the pre-heating as a negligible effect on the progress of the plate.

Q. And the arc itself can go on restriking until it really does catch fire?

A. I did not really admit the arc restriking, I would admit almost the continuous process from the moment it strikes as continuing until finally the copper has been burnt through. It could extinguish earlier but under the worst condition it would continue until it would burn right through one or both cause.

Q. Shall we now Mr Sharples turn to your new paragraph 4.a. which forms part of your memorandum. You set out what you consider to be the theory of the plaintiff's experts. We go over to page 2 paragraph 4.a. (2). Could you take the lid of the burnt box and look at it inside and outside, do you find any traces of what you described yesterday as plaster on it.

A. Yes my Lord I do.

Q. How do you explain the presence of that plaster inside and outside?

A. I would explain it my Lord. If we assume that the lid landed that way up, that before it fell on the concrete floor plaster had fallen from the ceiling on to the floor and that accounts for the relatively thin layer of plaster on what I described is the ambit side after it fell further plaster would fall from the ceiling in the beams settling here and that will account on the plaster on the upper side.

Q. When you talk of plaster you mean exactly what?

A. I mean whatever rendering there was on the surface of the walls and the ceilings of the room.

Q. Probably cement itself?

A. It could be cement, it could be a softer form of plaster I don't know what that was. It could be cement rendering but it's probably a softer plaster I would say.

Q. Would you care to estimate the time when you say

Court: Before the lid fell, part of the plaster will be falling before the lid would come back to the front and the surface would not be contaminated with plaster.

A. The lid remained vertical until its supporting bolt had melted and fell some time after the start of the fire.

Court: In that condition sufficient plaster might fall from the ceiling.

A. It is a very thin layer my Lord much thinner than the layer on the inside.

Q. At paragraph 4.a.2. each of these facts demonstrate that the Henley box remained upright in position fixed to the wall for some considerable time. Could you give the Court an idea of what you have in mind when you say some considerable time?

A. Of the order half an hour. Possibly a little shorter time possibly longer but I would not say that with the fire described it could be very much longer than half an hour.

Q. At paragraph 4.a.4. you say: the broken edge of the main portion of the door is relatively thin. Its appearance is in fact similar to the damaged front right hand end of the top plate of the box. This comment seems to suggest that this condition was while the lid and the box was still together.

A. That was not my intention.

Q. But wouldn't it suggest that?

A. Not to me my Lord but it is the evidence of a degree of intense heat wherever they were relatively situated.

Q. Mr Sharples I am going to refer to photo 48 which was put in by Mr Halwachs. Now when you look at this sort of damage, the blacken part there which goes diagonally from the lower left part across towards the right. Doesn't this blacken area roughtly diagonally across the lid and the box suggest that damage took place whilst these 2 were together, that the lid was on the box whatever source of heat caused the damage took place?

A. I suppose that people could interpret it that way but looking at the box as it lies there I do not see any continuity between the marks on the lid and those on the compound chamber. Indeed as I said the marks on the lid are distinctly brown in colour while those on the compound chamber are grey. This photograph is not a colour photograph and so it is impossible to say what the colour was at the date when these photographs were taken which I understand to have been several weeks after the fire.

Q. Would you look at photo 49. This photo 49 would it show that the fuse carriers show damage increasing from the right in the photo towards the left?

A. The damage to the right hand fuse carrier is comfortable to that of the centre fuse carrier of the damage to the left hand is considerably less.

Q. Does that suggest anything to you?

A. Taking into account the general appearance of the box I would say that the heat has been very much greater on the right hand side. To that step I think your Lordships observed that there was some brass on the hinges on the door on the left hand side which had not completely melted and this will support the left hand of the door was for some reason or another not subjected to the same degree of heat as the right hand side. This photograph 48 shows very clearly the sagging of the top plate and it is rather difficult to understand how that sagging on the top part of the door if the door were still in position at that time.

Q. The sagging would occur at a heat eight hundred three thousand?

A. No less, probably more.

Q. And so far as the corner of the lid is concerned it would require for melting it temperatures of more than 13000, in order to melt the lid of the box temperature of more than 13000 would be required?

A. Yes.

Q So if the lid and the right part of the box were damaged at the same time extremely localized heat would have been necessary?

A. Not necessarily localized but in this photograph the degree of heat to the right both on the box on the lid appears to have been greater.

Q. But you wouldn't say that the heat would have to be extremely localized?

A. Not if it had reached a temperature of over 13000° not necessarily localized.

Q. I am now to refer to 3 photographs. I am going to refer to photographs 9, 19 & 39. Now if we look at 39 first this is the wall between rooms 4 & 5?

A. The box is behind the photograph rather than to the front left.

Q. Then look at photo 9 look at the damage in photo 9 which is the rear partition in room 4 between rooms 3 & 4?

A. The photograph is a continuation to the left of photograph 39.

Q. Yes, now, you see the extent of the damage in these places?

A. I cannot find photo 39 on the little plan at all.

Q. It may not. At photo 19 now Mr Sharples and that is where there was the Henley box, compare the damage to the wall on the place where the box was to the damage on the other walls, Would you say that there had been on the wall any localized heat?

A. My Lord this I think is a question for fire experts perhaps for Mr Cole not for me.

Q. You would not yourself conclude that if the damage on the lid occurred together that the source of the heat would not have been external because then otherwise the whole of that wall would have been severely damaged?

Court: It is the least subjected to temperatures over 1000°.

A. My Lord I cannot deduce anything from photograph 19 which would support or reject the theory.

Q. Alright. Now do I understand rightly your hypothesis to be that the lid of the box fell to the floor when it had been heated by fire to at least 800 to 1000°C?

A. I think the lid of the box fell to the floor when the brass bolts fixing it on one side and the brass hinge support the other side melted which is a temperature of more than of the order I think copper melted the 1000 brass is probably to 2 or 300°below that.

Q. So it would be between 700 to a 1000?

A. Of that order, yes.

Court: Would you still say that those bolts melted in the heat?

A. Yes my Lord. I believe the material part of the hinge fixed did melt otherwise the lid could not have fallen.

Court: Because one of the bolts seem rather to have been cut?

A. You refer to the pin my Lord, that would melt at a considerably higher temperature than the brass fixing of the hinge and it has the appearance of having snapped rather than melted. If it was the last item carrying the door before it fell off it, it was already warm low red heat perhaps it might then have snapped when all the means to support had gone. It is the only explanation I can give my Lord.

Court: So it would rather seem that it was soldering which held those hinges to the

cover and the body of the box that give way rather than the actual device holding the 2 together?

A. I think my Lord the progress because of the evidence of greater heating on the right the first support to go would be the fixing bolts which close the door. The next to go would be the brass hinge supports possibly one before the other. The door might then be suspended by one hinge probably the lower one which I think is the one which had the broken pin.

Court: Would you verify?

A. It is the upper one and it is the lower portion of upper one. It suggests that this one went first possibly because it's nearer where the source of heating was coming from leaving the door hanging here and under its weight this one remaining pin would be insufficient and that would be the final breaking point letting the cover drop.

Q. The pin is not of steel?

A. I think it is of steel.

Q. Would you try and test it to see whether it was brass or copper?

A. I doubt very much if it would be brass the other one is entirely entangled.

Q. Would you use a magnet to try and see whether it is steel?

A. Strange but I can't get the magnet to stick anywhere on this, I'm sure that this is not of brass but the magnet appears to have lost its power.

Q. Mr Maisey's magnet?

A. I'm afraid so my Lord. I think it has become demagnetized possibly due to heat.

Q. There's a key in the magnet.

A. It is not steel.

Q. So it must be brass or copper?

A. It must be brass. I think my theory remains unchanged, the brass snapped rather than melted.

Q. So the lid would have fallen at a time when the box has been heated to something between 700 and 1000?

A. Yes.

Q. When metals and I am speaking of cast iron heat as the temperature increases the metal becomes softer obviously?

A. Yes my Lord.

Q. Can you explain to the Court therefore how the lid could have suffered a brittle fracture at 700 to 1000° when the top of the box clearly shows the ductibility at that temperature?

A. I did suggest indeed that the photograph which I have just referred which shows the sagging and the door indicated that the door had already fallen before the sagging occurred. Therefore the temperature required to cause the sagging in the top plate did not arise until after the door had fallen.

Court: Could the door fall before the temperature reached 700° at least?

A. That temperature is required to melt its support. It is not the temperature at which the cast iron door could become melted.

Q. But by that time?

A. No my Lord I don't agree. I agree with you when you said that when the temperature rises it becomes softer but there was a definite point up to which the metal remains brittle beyond that point when it begins to glow it begins to soften. There is not a gradual softening from a temperature we are in now up to 1000° the metal will remain brittle.

Q. At what time would you say it will start?

A. My Lord, I am not a metallurgist. I cannot answer that question. I am constantly referring to papers given to me by Mr Davidson and others in order to agree to some of the temperature quoted to me by Counsel.

Q. The lid which is in Court after six years, it has been handled by experts, been taken to the Judicial Enquiries, left in store and so on, but if we turn to the photos which were taken at the time photos 45 & 46, you can see the odd shape protrusion at the cut edge of the lid. This is not so apparently now with the lid whereas in the photograph it is very apparent, it can be seen.

A. Yes.

Q. Does the configuration of the edge not dissuade you from the opinion from a brittle fracture on impact?

A. Not at all because after the impact obviously the lid was subjected to a considerable amount of heat which caused the serrated edge rather than the thin break which were the situation

immediately after it snapped. After falling, breaking it was subjected to very considerable heat which caused the serration. The serrations are greater here than there but one will observe similar formation in the top plate.

Court: These jagged edges would not be caused by the lid breaking as a result of the fall?

A. No my Lord, posterior to the fall, these jagged edges are visible in the top plate as well and it is not claimed to the top plate which was subjected to any arcing. Indeed my Lord they are visible in these photographs. If I may refer to photograph 46 above the gap in the door the missing part of the door you will see the top, the lower right hand corner of the top plate and some very odd serrations can be seen there and can still be seen in the box itself on the table here This is why I have described the condition of the top plate as not being dissimilar from that of the door.

Q. So that you agree that by falling in brittle fracture of the lid would not show it in that condition?

A. It would not.

Q. Now Mr Sharples I am trying to understand something about that lid. Your suggestion is that it fell perpendicularly?

A. Not necessarily particularly after the comments this morning, that it probably broke away finally from one corner both at the right hand side with one hinge finally a second it would then have a twist as it fell and could laid in almost any position, on its edge, on its back, on its front.

Court: But it would swing laterally and not towards the front, away from the wall?

A. I did not think it might go on swinging laterally and of the swinging some distortion could occur so that I would not like to say exactly what part of the lid hit the ground first.

Q. But where it would land, how far from the wall?

A. It will land very nearly vertically below the box possibly towards the right hand side and it will bounce.

Q. It would bounce to over a distance of 5 feet from the wall?

A. No a foot.

Q. We have evidence to the effect that the lid was found 5 feet away from the wall?

A. I have suggested my Lord that the firemen entered this room after the fire died down. The pressure of the fire hose is very great indeed, it is not just a pressure in the mains it is usually supplemented by the pumps of the fire engine it is often necessary for 2 firemen to come to counteract the thrust of a hose when its jets being played that jet is sufficient to move an object such as the top plate quite a distance. It could almost float on the jet of water and could be moved thereby to any part of the floor.

Q. If I understand rightly your explanation Mr Sharples would it not mean that the firemen's hoses removed rubble, ash, burnt shoes half burnt souls and so on removed all the rubble over a certain depth, cleared the floor of any rubble, landed the lid on to the cleared floor and then covered that lid all over again with something like 4 or 4½ feet of rubble?

A. No my Lord it need not necessary to be so. They did not just come and play the hose on one part of the room, they would spray it around the place, washing materials here and there. I merely advance that a simple reason for the displacement of the lid from the position where it fell to the position where it was found,

Court: But normally would you not expect a fireman to stand somewhere at the entrance of the room on fire and direct his jet of water towards the wall rather than stand with his back to the wall and direct the jet away from the wall?

A. The room is very small. He would probably play around the room. I've suggested as a possible means whereby the lid was moved.

Court: It would be far more likely for the jet to remove the lid closer to the wall than away from the wall?

A. Away from the door my Lord. If it fell close to the wall it would fall in, fell off the box. The jet would move it further away towards the back at a further corner of the room one would expect.

Q. Mr Sharples at around 1800°C the cast iron will be of what colour? I'm asked to suggest to you that at the temperature of 800°C it would be cherry or bright red and at 1000°C it would be then be white colour?

A. I cannot deny it.

Q. Mr Sharples if it was stated in evidence by Mr Woodcock so far as I can remember that the lid was so constructed of cast iron and so that it always be able to close properly and that the CEB people always closed it properly. I would like with force permission, I'm sorry I have not been able to give any warning of this. A few photos have been taken this morning of a Henley box visible outside a public office in Port Louis just taken. I am going to show you this photo of the Henley Box, would you have a look at it?

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This photo is taken from underneath the Henley Box, will you look at the lid, at the bolt, is the lid properly closed and the bolt fully in position?

A. It is not.

Q. I put it in my Lord.

A. Where the box was relative to the ground and whether it could reach of passers-by or workmen from the box which is in the building.

Q. I am informed by Mr Cole it is of a height of 10 to 12 feet from the ground?

A. May I have the address, I would like very much to see it, just to satisfy my curiosity.

Q. Mr Sharples, as soon as you are free Mr Cole will take you. It's only 200 yards from here, at the Ministry of Works, Port Louis. Now, would you look at the same Henley box taken at different angle and tell the Court what you think of the installation?

Document "BN" produced

A. I don't have to look long my Lord, it's terrible.

Q. Mr Sharples as I think the photos need not verbal comment I shall just put the remaining 4 and invite your comment?

A. The only comment that I have to make is that the first photograph that I saw did not indicate that the door was properly fastened in one corner and not in the other. My impression was that the door was not properly fastened by either bolt. There is no distortion, no flexing from the door that I detect. The only other comment I would like to make apart from the door not being properly closed there is nothing with the box in the installation apart what I

described there is nothing I can tell.

Q. Before I pass on finally to your conclusions Mr Sharples there is just one point. Yesterday you took when comparing the average kw with actual kva you took the average at which we arrived of .645 as being a diversity factor in order to reach your figure?

A. No I did not take it as a diversity factor. It takes it as a factor which converted the average kw to actual kva that is not what I mean by a diversity factor. It is not a diversity factor.

Q. It only remains for me Mr Sharples

Sir Raymond Hein QC: Could we have an opportunity to look at the photographs?

Mr David QC: I don't know whether if your Lordships will bear with me or not. Could we give Mr Sharples just five minutes to see the installation for himself with Mr Cole before my winding up will take place. It is only 200 yards from here.

Court: It seems that one of the sides of the door is secured by means of a piece of wire. There is no bolt, it appears that it is secured with a piece of wire.

Mr. David QC: I don't know whether if I may invite the Court to visit it but otherwise Mr Sharples.

Court: Mr Sharples will visit it.

Mr David QC: Thank you very much my Lord.

Sitting of 15th March 1978

AFTER HAVING GONE TO VISIT THE HENLEY BOX AT THE MINISTRY OF WORKS MR SHARPLES REPORTS AS FOLLOWS :

Mr David: Mr Sharples, these photos represent in fact the installation?

A. Yes.

Q. Without in any way condoning an installation such as the one I saw, I would say that it is 12 feet, perhaps, off the ground and it constitutes no danger to life and there is no danger of fire. Is it an acceptable installation, would you accept it as an installation?

A. No my Lords.

Q. Thank you. We come finally to your conclusions. In so far as para 5.1 at page 11 is concerned, if the assumption that the combined demands

would not exceed the maximum rated capacity of the box had been correct, as you suggest, then Mr Sharples, it would not have been necessary to fuse at a greater cross section than one No.17 SWG tin copper wire?

A. That is so, my Lords. I understand that there was no No.17 in stock and the CEB stock only the even numbers; this is not entirely unusual.

Q. Is not that odd?

A. Not odd. It is unfortunate that in this case 17 should have been the rating for that but they don't stock every size of everything so one sometimes finds in a shoemaker's, they just don't stock the half size.

Q. The fact that the fuses were blowing should this not have been a clear indication that the permissible currents were being exceeded?

A. No my Lords, not in that sense. One would expect fuses to blow under certain circumstances; the box itself describes a 60 amperes fuse which the box itself says would blow at 122 amperes. It must be understood that the fuse for 60 amperes would never blow at 60 amperes and will blow at some figure around about 122. All that the defendant has done is to raise the 60 amperes to approximately 75 or 80 and raise the 122 to approximately 140 to 150 but in either case currents could pass even if correctly fused which would exceed 60 amperes without the fuse blowing but they went too far and the statement by learned counsel is not strictly correct.

Q. We go to para 5.3 at page 12 of your report. You say "the loads actually carried by the henley box did not exceed the manufacturers' rating" but you must surely agree that the peak loads considerably exceeded this figure or don't you?

A. Yes, I consider not your term peak, I think you probably mean momentary, short term loads such as I described as arising from a welder starting up motors.

Q. Could they be sustained for a quarter of an hour or more?

A. No my Lords, much less than that.

Q. What is the maximum you would say?

A. For welding 15 seconds, for motor starting, anything from a fraction of a second to two or three seconds.

Q. What about other overloads?

A. I can't think of any other overloads in this case, if you will let me know what you have in mind.

Q. I am speaking of the fuse blowing?

A. I attribute the blowing of the fuses to transient overloads.

Q. Para 5.4 "short circuits in one or other of the consumers' installations caused the blowing of the yorkshire", we have done with that yesterday, and I have referred you to the evidence of the workmen and you have given an explanation, so I shall not say more than to put it to you that this conclusion of yours is disproved by the evidence of the workmen in relation to the way in which the remains of the fuses showed that they had been blown on overload and not on short circuit?

A. My Lords, the workmen were referring to the blowing of fuses, the blowing of particular fuses on two or three occasions at a time when on every shift those same workmen must have been repairing innumerable accountable fuses day after day, they had no particular reason, they did not know there was going to be a fire, they had no particular reason to take note of the manner in which those particular fuses blew whether they melted at the centre over a distance of half an inch or disappeared altogether. The event happened six years ago and I can only suggest that the workmens' memories were at fault.

Q. You would agree that in the log book should have been described the details of actual faults attended to and remarks if any?

A. No my Lords,the log book provided for these entries to be put in, I would not expect workmen returning from a round or possibly more than one fault to be able to report to the man who kept the log book all details of the fault, nor do I think that it would be particularly relevant to give a description of each fault attended to. There are spaces provided but I do not think they were all relevant for the purpose for which that book is kept.

Q. So you find nothing wrong in the way in which this book is kept?

A. I think that as much information was recorded in that book as was necessary for its purpose.

Q. There is a column which says "state size of

fuse renewed if any" and there is only one entry in the extract that has been given us?

A. That does not surprise me. What does surprise me really is that even if one found it'sway in, it was probably done because somebody instructed the workman to put that size.

Q. We turn to para 5.5 p.12 "uprating the henley box fuses to 2 x 18 SWG twisted wires did constitute a technical over-fusing by approximately 33% and a potential overheating of various elements of the box by some 75%". You mean that with the excess current flowing that would be permitted by two No.18 SWG, this potential overheating would occur?

A. Yes the fitting of two No.18 fuse wires permitted overloading to occur if there was an overload. Their very presence enable currents to give rise to excess of heating to be applied.

Q. Para. 5.6 - unfortunately, Mr Sharples, I have again to put it to you that the fuses blowing were overloads and this is made clear not only by the workmen's evidence but by the opinion expressed by both Messrs Turner and Woodcock?

A. I don't recall Mr Woodcock attributing the blowing of these fuses to overloads other than short term overloads such as I have already described.

Q. I seem to remember Mr Woodcock stating that short circuits blow the fuse very quickly so that the whole length disappears?

A. I understand now, my Lords, what is being asked. Short circuits can be of varying values. Yesterday in the course of my cross-examination I agreed that a short circuit which took the form of an earth fault when added to the normal load would not have been sufficient to blow the single 18 fuses because the current in such an earth fault would have been limited by the earth loop resistance to a fairly low value. That is not the only short circuit, you can have short circuit between phases, you can have short circuit from phase to neutral and the amount of current which flows in such short circuits is limited by the impedence of the circuits in which it flows. In the case of the henley box my colleague calculated that a three phase short circuit could reach a value of 2350 amperes. I myself, without indulging in calculation, estimated that the phase to neutral short circuit would

be about two-thirds its value. From that box to the yorkshire fuses is the further length of these aluminium cables, I don't know their precise length, nor their characteristics, but a rough estimate is that the phase to neutral short circuit at the yorkshire fuses is of the order of 1200 amperes. There is an attenuation as one proceeds from the power station to the transformer through the henley box to the yorkshire fuses, the amount of short circuit current attenuates due to the impedence of the circuits which increase as the distance from the source increases. From the yorkshire fuses to the consumers' installation we are getting more and more impedence. The value of that impedence depends upon the size of the wiring in the consumers' premises right down to the appliances if the fault occurs in the appliances, there is an impedence of the fault itself, so it is impossible to say what the current would be in a phase to neutral and if I repeat phase to neutral, my Lords, that is the most likely form of short circuit in the Textile Industries where most of the loads was single phase and the three-phase fault is very remote. But I again would estimate a maximum figure in the consumers' installation of around 1000 amperes and a minimum figure of perhaps as low as 200 amperes. Now a degree to which the fuse protecting that circuit will blow or melt depends on whether it is the 1000 amperes fault or the 200. If 200 little more than melting at the central point would have occurred similar to the degree of melting from an overload. On the other hand if a 1000 amperes had blown, a considerable portion of the fuse wire would have disappeared. When Mr Woodcock referred to a short circuit causing disappearance of a large portion of the fuse wire I am sure he had in mind a substantial current.

Q. We go to paras. 5.7 and 5.8. I am advised to put it to you that the fact that reignition to a total of nine loops occurred in your single test scarcely bears out your conclusions in those paragraphs and if the arc to neutral via the box was established the more limited current would be sustained much longer.

A. My Lords, when I wrote these conclusions, I had not heard of the theory of an arc from neutral to the lid of the box. The comments here refer to interphase arcing and earth arcs. I still maintain that the dimensions of the box are favourable to self-extinction and in our test the ASTA test (Document B) the arc

did extinguish in 8/100th of a second without having to be cut off by HRC fuses or, in the case of the test, the master circuit breaker. We had an arc which was sustained under much more arduous condition than this box in situ could have incurred. We got a major arcing condition which might have develped into Mr Turner's runaway condition, it did not so develop, it went out of its own accord in 8/100th of a second.

Q In a single test?

A. What do you mean by a single test?

Q. You did not repeat?

A. No my Lords, that particular arcing came something as a surprise to us. It was a bonus to the test which was the test: what happened to the fuses under short circuits. We learned that an arc could and did develop but did not go out.

Q. Para. 5.9 "The high earth loop resistance would either not permit an arc to earth to sustain itself or restrict it to very low levels at which no significant damage could be caused". Do you not agree that localised arcing at 4 amps to the conductor would overheat the conductor at that point?

A. My Lords, this para. 5.9 related to an arc to earth; at that time we were thinking of an arc on to the door. I do agree that an arc within the hole on the top plate could intense local heating and that I have referred to in my paragraph 4, it is not covered by my conclusions which were written prior to that.

Q. Para. 5.10 "design of the fuse holder contacts are such as to exclude any possibility of low current arcing arising in the short period....." I am advised in respect of that paragraph to ask you again: Is not the evidence of arc markings round the rim of the part consistent with the 4 amperes arc level and the cut edge of the box lid consistent with arc current, an order of magnitude greater that is, about 50 amps?

A. I am sorry, my Lords, I don't follow the question.

Q. Is not the evidence of arc markings round the rim of the part consistent with the 4 amps arc level, whereas the cut edge of the box lid is consistent with arc current, an order of magnitude greater, that is about the order of 50 amps, all other evidence having been burnt in the fire?

Court: I think you can put it if he accepts that it was cut.

A. My Lords, I am a little confused as to relationship of this test or its double question to five-tenths, but if we just deal with the question out of context, the first part of it: do I agree that the markings in the holes are consistent with the 4 amperes arc to earth, I would say I cannot agree because I have not identified those markings.

Q. At para. 5.10 "moreover the plaintiff has produced no evidence at all in support of his theory that low voltage did occur"?

A. I have not seen evidence nor heard any evidence to that effect.

Q. In respect of paras. 5.12 and 5.13 of your conclusions will you not agree that although experience indicated that the box was of generous dimensions the manufacturers' limits as to use were borne out by both ASTA and ERA experiments?

A. No, my Lords, I consider that the box was designed to withstand successfully considerably greater currents than the 60, I put an oblique 60 to 122 amps, meaning that even when correctly fused it could stand up to 120 amps without damage but it could indeed stand currents greater than those figures. As regards the short circuit test it stood currents substantially greater and I still maintain that that box was capable of withstanding considerably heavier loads than the manufacturers specify. I would be very surprised if any box manufactured by a reputable maker did not.

Q. But heavier currents do damage the cable ends?

A. If the cables themselves are inadequate.

Q. The blowing of the fuses having to our mind - it is for the court to appreciate - demonstrated that heavier currents were flowing, I put it to you that overwiring of the henley box was misuse of that box?

A. Not the overwiring in itself; it permitted misuse to take place had these excess loads been applied.

Q. And therefore the overwiring was misuse?

A. It was not good practice.

Q. I put it to you also that lack of adequate earthing permits dangerous earth leakage currents to be sustained?

A. It permits continuous earthing currents to be sustained whether or not they are dangerous would depend on the position at which the arcing

of those currents persisted and whether or not they were although limited by an earth loop resistance whether or not they were greater than the current at which the fuse will blow.

Q. I put it to you that a combination of what I shall call these two mal practices that is, the overwiring on the one hand and the lack of adequate earthing on the other, created a situation which led to the fire?

A. Taking the two together they created a situation where excessive currents could flow in the sense of sustained overloading; they also permitted earth leakage currents to continue to flow. At the values measured for the earth loop reistance that danger would have existed even though the box had been correctly fused because at 61 ohms it was not possible to pass more than 4 ohms to that.

Court: 61 ohms?

A. 61 ohms was the earth loop resistance.

Mr David: My Lords, I have done with Mr Sharples.

A. I have not finished my Lords.

Mr David: Sorry, please go on.

A. These currents, my Lords, would be excessive, they could cause overheating. Tests which we have done show that such overheating could not have caused the fire in the way suggested by the plaintiff. I therefore, my Lords, cannot conceive that either the overwiring or the fuse or the inadequate earthing arrangements of the cable sheath led to this fire.

Re-examination

Re-examined

Sir Raymond Hein re-examines:

Q. Mr Sharples, after hearing the suggestion made by my friend I should like to ask you whether your estimate of potential loads that you gave at p.3 of your memo is the maximum?

A. They do.

Q. With particular reference to Textile Industries would you give us those loads?

A. My Lords, in para 3.17 of my memorandum I have estimated the potential load of Textile Industries in the 7th column from the left at 15 amperes. This compares with a figure of 27 amperes calculated by Mr Davidson in para. 6.20 of his memorandum which I have in fact repeated in the 7th column of the

table of 3.18 in my memorandum. Mr Davidson's figure of 27 is higher than my 15 because he used a smaller diversity factor.

Q. We have it in evidence from the plaintiff that when Mr Davidson visited Textile Factory on the 18th July there were only 40 sewing machines in use. Would that still affect your figure or Mr Davidson's figure?

A. My Lords, the 40 sewing machines using the figures which Mr Davidson himself obtained from the named plates of those machines, if they were all running simultaneously they would generate a current of approximately 23 amperes in each phase.

Q. You have stated that it is an absolute impossibility that those 40 machines were in use at exactly the same time?

A. It goes far to say an impossibility, my Lords, it is highly improbable, that is why we applied a diversity factor. If I applied a diversity factor, as I have done in my chapter 3, it would reduce the 23 amperes to about 8 amperes per phase in respect of the sewing machines, allow two-thirds amperes for lighting and ironing which would normally accompany the processes and we would get 10 12 amperes.

Q. Do you think that, in any case, there could possibly have been a higher normal loading at Textile than the figure of 27 quoted by Mr Davidson himself?

A. I do not think so.

Q. My friend questioned you yesterday in connection with that table appearing in the I.E. Regulations book?

A. Yes.

Q. I should like you to give us the very precise bit of information, the note to the relevant passage of that book that my friend has called special attention to reads; "the figure given in the above table will in the absence of recommendation made by the maker of the fuse", will you make a distinction between the maker of the fuse and the maker of the box?

A. There is a distinction yes. The table relates to fuses not to the box which contains the fuses. It is a general table referring to fuse wires and the figures quoted in that table would be subject to any information that the manufacturers of that wire had to communicate.

Q. Did you happen to know whether Henley also manufacture fuses or boxes?

A. They certainly manufacture the cast iron box, they probably contract out the manufacturer of the porcelain contacts, the fuse wire which is fitted to those fuse carriers, it is up to the user to purchase from whatever source he sees fit.

Q. Your attention has been called to that loop not an earth loop but an aerial loop in that cable?

A. Yes.

Q. Does it, in your view, constitute a danger?

A. No I can see no danger in it.

Q. It was suggested to you that it was again an unfortunate practice?

A. It is unfortunate practice, it is not one that I would advocate but in itself it constitutes no danger to life in that any damage to the outer sheathing which I could not detect outside your chambers, my Lords, but there is some evidence here of damage to the outer sheathing, that would merely expose the neutral to contact by some person climbing up on the latter and if he did not come in contact with the neutral it would not hurt.

Q. My friend has passed to you in the witness box that yorkshire fuse and has called your attention to the fact that the figure of 50 amps appeared on it. Does that connote anything in connection with the use of the wire which would be used inside?

A. To us it connotes the same meaning as 60 amperes capacity of the henley box namely that it should not be wired with fuse wires whose rated value exceeds 50 amperes. It does not preclude the wiring of the yorkshire with the wire whose fuse rating is 45 amperes, 20 or 30 amperes, any lower figure than 50.

Q. You have also been asked about that intermittent contact which may have been taken place at the outgoing hole on the top plate and you explained that unless the two holes were in contact with the outgoing cables simultaneously it would necessarily cause the big bang?

A. Correct.

Q. The whole phase would blow, it would not cause the phase to phase fault which would cause the short circuit? Would you imagine that one could blow and then the other in a sort of tic tack manner, one should blow

at a time, another one should blow at another time, they should never meet?

A. It is conceivable that the core of the conductor passing through one hole if the insulation has been softened in the manner suggested by the plaintiff came in contact with this hole and caused arcing; that arcing could persist for a short period or even a long period. If during that period a similar situation developed in the other hole then you would have this interphase short circuit but it is also conceivable that before the second one develops the first one had ceased; this alternating one could imagine as happening frequently, or at intervals a week or so, it is a theory, I would think, most unlikely that you would get a tic tacking but the plaintiff is very anxious to avoid the situation where the two do coincide because that would immediately rupture the fuses, he cannot contemplate the two things occurring simultaneously.

Q. If there was a phase to earth fault at the top of the box at the same time there was a neutral to earth fault which would cut the lid, what would be according to you the result of that total fault?

A. As I see it the plaintiff has developed a new type of arc and the mention of the figure 50 amperes suggests that the value of that current in the arc might be 50 amperes which would be sufficient to cut through cast iron. For a current of that level to flow, it clearly cannot be an arcing to earth because that would be limited to 4 amperes so, he has evolved a theory that a low current arc has developed at one of the phase holes in the top plate. This puts that phase down to earth and the neutral if it comes in contact with the lid of the box, the neutral would have risen, because of the phase fault, to 230 volts. An arc could develop between the neutral and the box, the neutral now taking the place, so to speak, of a phase because the phase has gone down to the box, the neutral has risen, I think this is the theory. Let us assume that the plaintiff's theory of an arc between the neutral and the box has been struck and I can't see how it could have been struck other than by, perhaps, a strand of a neutral conductor having come adrift and come in contact with the lid. Let us suppose the strand did come adrift and the cutting process as envisaged by the plaintiff commenced to cut the corner of that box, I think, I would like to have the green box, my Lords, for a demonstration of what I am about to say if I may.

EXHIBIT 14 IS PASSED TO THE WITNESS

The arc envisaged would strike from the neutral terminals here to the box at approximately this position and the cutting action would start across here following the outline of the henley box in question. That arcing is taking place inside the box with the lid closed. It is sawing its way through here; with the box closed and nobody denies that this corner was properly fastened, this part of the lid is in intimate contact with the main body of the box, so when sawing arcing is completed here, the arc should continue and one would get signs of the cutting continuing here and as it progressed this way, the cutting would continue here. It is inconceivable and I mean inconceivable that the cutting should continue just sufficient to detach this bit without damaging any phases inside the box. There is no evidence whatsoever in that box there, my Lords, that there were any arc roots, any arc cutting inside the main portion of the box, it is unbelievable that the cutting arc should have ceased at the instant when it reaches this end and again when it reaches that end. I just cannot imagine it. It is also to be observed that the theory of an arc causing this whole portion to vanish as in a flash has now been dropped, we go back to cutting not even melting.

SIR RAYMOND: Before we close our re-examintion of Mr Sharples we should like Mr Sharples to demonstrate to the Court, to make proof of the statement which he said yesterday about the burning of the PVC. We shall call another witness to talk of the experiment which had been carried out. May I ask Mr Sharples and Your Lordships if we can leave the Court for a moment to have that experiment carried out. There is another experiment which I should like to demonstrate to the Court; it has been put to Mr Sharples in cross-examination forcefully that those sparkling metals dropping onto cartons would set fire to the box. We propose with the Court's permission to demonstrate that it cannot do; we have the necessary installation made and the equipment provided for a demonstration along that line.

COURT ADJOURNS TO THE SPOT WHERE DEMONSTRATION IS TO BE CARRIED OUT

AFTER DEMONSTRATION COURT RESUMES AND MR SHARPLES REPORTS AS FOLLOWS:

A. The first experiment that of the incandescent copper globules demonstrated that even though the copper globules fell on to the cardboard

whilst they are still incandescent, they did no more than spot the surface of the cardboard. In my earlier evidence I stated that the globules had shown their incandescence before they passed the top of the box and then descended the floor level, so the experiment which Your Lordships had witnessed is more arduous than in our test of the box. The second experiment is that we endeavoured to persuade the PVC to flow down the conductor and drip flaming particles on to the cardboard. Although we heated the PVC to the point where it actually caught fire, we were unable to persuade it to flow and I endeavoured to knock flaming pieces on to the cardboard, again unsuccessfully. The flaming of the PVC persisted for so long as the blow torch was held against the PVC, as soon as it was removed the flame went out because they were no longer in an atmosphere of 400°C and over. It has to be admitted, of course, that the test did not apply the heat in the manner that would come from first heat of current flame through the conductor supplemented by heat from arc of 1 kw power but it was the nearest we could demonstrate in your presence, my Lords.

Mr David: Mr Sharples, in the demonstration as we could see the cables were heated by external heat?

A. That is so.

Q. The copper conductor was quite cold?

A. I don't know. If you mean it has not been preheated yes.

Q. Do you not think that the result would have been different if there has been the electrical heating that we have been discussing in the course of this case?

A. Different yes because the heat would come from inside but in the end the results, I think, would be very similar.

Q. If the cardboard is brought to the PVC which is of course blazing, surely the cardboard does catch fire?

A. Of course.

Q. Did not the flame go out because of the cold copper.

A. It went out because the ambient temperature surrounding the PVC was less than 400°C than that applied to the air externally and to temperature of the copper internally.

Q. If it had been very hot copper from electrical

heating would it not have continued to burn?

A. In none of our tests did we exceed a temperature in our case of 204°C and in the case of the plaintiff's test 216°. We do not know what would have happened had the internal temperature been greater.

Q. We don't know what would have happened?

A. We do not know.

Q. So we do not know about the question of flowing or not.

A. Flowing occurs at about 120°C, it certainly exceeds that temperature and I observed no flowing.

Q. Earlier on you mentioned that the note to A1, it is quite clear that a fuse is in your regulations defined as a device for opening a circuit by means of a fuse element, in other words, when one talks of the fuse one talks of the entire device?

A. My Lords we.....

Q. Excuse me, if you remember, earlier on when you were examined by Sir Raymond you stated that the note to Table A1 referred to the fuse as distinct from the box?

A. Yes.

Q. I am referring to the definition of fuse in the regulations as being a device for opening the circuit by means of a fuse element designed to melt when an excessive current flows, in other words, when one talks of the fuse, one talks of the entire device?

A. When one is talking of the rating of the fuse wire one is talking of the wire not of its container.

Q. You are not talking of the container?

A. Not in Table A1. It was the only table to which I was referring.

Mr David: That is all.

No. 53

EVIDENCE OF JEAN HENRI

MR HEIN CALLS AND EXAMINES:

Mr Jean HENRI (Sworn) of Quatre Bornes

Q. Will you tell the court what is your work at the CEB?

A. I am in charge of the Meter Laboratory of the CEB.

Q. Yesterday at my request you carried out a test with what type of equipment?

A. With a henley box fuse of 60 amps 3 phases.

Q. What type of fuse wire did you put?

A. My fuse wire was No.17 SWG twisted per phase.

Q. Why did you use No.17.

A I used No.17 because No.18 normally fuses at a high amperage whereas for the amperage we are going to pass through is 140 so as not to have any break during my test.

Q. Your test was carried out during what time?

A. The current was switched on at 10.45 and we finished at 15.45.

Q. 5 hours?

A. Yes.

Q. The outgoing cables were of what type?

A. The outgoing cables were 3 PVC of twin 7.064.

Q. Insulated and sheathed?

A. Yes.

Q. What was the test measurement used?

A. I used my test..... with maximum rating 150 amps.

Q. What is the current that you passed during 5 hours?

A. The continuous current passed was 140 amps per phase.

Q. How did you check that continuous current 140°C?

A. I have an ammeter for our test and a..... to counter check our check.

Q. Did you put earth resistance?

A. Yes I put the earth resistance of 61 ohms in series with the earth to the cable box.

Q. What is the ambient temperature at the start of your test?

A. When I started the ambient temperature was 31.5.

Q. You recorded the various temperatures at various times described as well as the state of the PVC at the various stages, you have the box and you have the outgoing cables produced to the court?

A. Yes.

Mr David: You did not simulate any test with two No.18 SWG?

A. No.

Q. The two No.17 SWG, I am given to understand, has 1.36 times the area of 2 No.18 SWG?

A. I have no specification, I am not able to answer that question.

Q. If the two No.17 SWG has 1.36, the cross section of two times 18 SWG the resistance of the 2 No.17 SWG would be only .735 times that of the two No.18 SWG wires so that the heating at the same current would thus be less than $\frac{3}{4}$ times what it should be for comparison?

A. I have not the specification, I can't answer.

Q. What were you simulating?

A. I have been asked by Mr Hein to get through a cable box and a cable 140 amps, this is what I did.

Q. For what purpose?

A. He asked me to do that.

Court: Where did you get that temperature from the room?

A. I got a special thermometer.

Court: Where did you take it?

A. From room temperature in the area of the cable box.

Court: Nothing to do with the temperature on the cable?

A. No.

Cross-examination

Cross-examined

Mr David: Was the henley box in this test a new unit or was it removed from service?

A. It was a new unit.

Q. The neutral was not connected through in this experiment?

A. No.

Q. In your experiment the box was not filled with compound, or was it?

A. It was not filled with compound.

Q. Was the bottom hole, in any way, closed?

A. The cables were full of holes but it was not closed.

Q. When you were using a new box you did not attempt to simulate any contact deterioration or similar fault that could have materially increased the temperature of the wires?

A. I had to make a test on the cable, my only

concern was the cable.

Q. The balance was on a 3-phase load?

A. Yes.

No. 54

EVIDENCE OF JOHN SHARPLES (continued)

MR SHARPLES IS RECALLED

Mr David: Do you agree that two times 17 SWG wire has 1.3 times the area of the two times 18 SWG?

A. I take your word for it, I don't dispute that. I am sure this is based on fact.

Q. So that its resistance would only be .735 times that of the two No.18 SWG?

A. I don't dispute that.

Court: The resistance would be more.

A. No my Lord, the resistance would be less.

Court: The one 17 or the one 18?

Mr David: The resistance of the two 17 would be less than $\frac{3}{4}$ that of the two 18.

A. The resistance of the two 17 would be approximately $\frac{3}{4}$. I am sorry, my Lords, the resistance of the two 17 would be greater than that of the two 18.

Court: This is what I am saying.

A. The two 17 are thicker than the 18, therefore the resistance will be less and it would be about $\frac{3}{4}$ of that of the two 18, the higher the number the thinner the wire.

Mr David: So that the temperature of the cable would not rise to the same value as it would with a two 18?

A. I must qualify that, my Lords. The temperature of the fuse would not rise to the same value

as had the fuse been two 18 and to that some of the heat conducted on the fuse to the conductors would have been less but, my Lords, it would not have been possible to have used two 18 because they would have blown at that current.

Mr David: I asked you about the temperature of the cable, what about cable terminations?

A. You mean the terminals.

Q. Yes.

A. They would have been at a lower temperature. We did not measure these temperatures because all these temperatures have been measured in the corresponding ASTA and within limitation the ERA test. This is a rough test to show what would happen. At your suggestion, my Lords, we were asked to do that test.

Q. You were not purporting to simulate the exact condition?

A. No, my Lords, the conditions were simulated in the ASTA test which were accurately measured and temperatures at numerous points were measured.

Q. What, in your opinion, would be the value of this test?

A. Certainly to demonstrate in our experiments the behaviour of the PVC when a current of 140 amps was passed through it for 5 hours. We hoped that it might show the degree to which PVC would flow. I have inspected that box after the test there is some sign of flowing at the bottom very close to the terminals, there is some sign of softening; we did put a resistance in the earth circuit against the possibility of the course of the conductors migrating or decentralising to the point when they came in contact with the metal top plate, they did not do so, therefore that resistance served no purpose because the fault which we thought might occur which according to the plaintiff's theories did not occur.

Court: If no resistance, there is no heating, how many amps would a cable of this size carry without melting?

A. A single conductor of .0764 would carry, without reference to tables, probably 60-65 amps, two of them would carry 120 amps and be within their capacity.

Court: Two of them.

A. As they are here paired, they would carry out 120 amps without overheating, that is

to say, they would be within the normal temperature rise.

Court: Unless there is a fault probably simulated in the box you don't expect it to melt at 140?

A. At 140 we would expect some heating to take place, it is the maximum amperage that we can counteract.

Court: I don't blame your experiment, but does it show very much?

A. I am afraid it does not, if the ASTA tests show that.....

Court: The question is if there is a fault somewhere which is going to increase the heat, it is most unlikely that it would melt at 140?

A. It is the plaintiffs who suggest that it might cause migration at cores.

Court: You would not expect it to melt unless there was a fault somewhere creating overheating?

A. True.

Mr David: Finally the result of what I would term an unrepresentative single experiment could not be accepted as example of what happened or rather what we suggest happened in what we believe is a deteriorating situation in a poorly engineering temporary site of Bata?

A. No it does not provide conclusive evidence of anything.

Mr. David: Thank you.

Re-examined

Re-examination

Mr Hein: There is one question arising through Your Lordship's question. Mr Sharples could you evaluate the heat generated by that blown up, would it compare with what amperage if any comparison is possible?

A. No, my Lords, I can't answer that question. The temperature would undoubtedly be of the order of 140°C, but how that would compare with the current of 4 amperes I don't know.

Sir Raymond: Thank you.

SIR RAYMOND HEIN CLOSES THE CASE FOR THE DEFENCE

MR DAVID HAS NO EVIDENCE IN REBUTTAL

COURT ADJOURNS FOR ARGUMENT TO TUESDAY 21ST MARCH

In the Supreme Court

No.55
Judgment
12th June 1978

No. 55

JUDGMENT

Record No.19194

IN THE SUPREME COURT OF MAURITIUS

In the matter :

1. BATA SHOE COMPANY (MAURITIUS) LIMITED
2. EAST AFRICA BATA SHOE CO. LTD. (MAURITIUS DEPARTMENT)

Plaintiffs

v.

THE CENTRAL ELECTRICITY BOARD Defendant

JUDGMENT

In and around 1972, various industries were moving into the industrial zone of Plaine Lauzun. The Plaintiffs (hereinafter referred to as "Bata") rented from the Development Bank of Mauritius a warehouse which was composed of two entirely independent units. It used the first unit as a Finished Goods Department, (which we shall call the "Department") and the second unit as a Raw Material Store (which we shall call the "Store"). There was no direct entry from one unit to the other: to go from the Department to the Store, it was necessary to go out of the Department, and enter the Store by an independent door. There were Bata Employees at work in the Department, but no one was employed in the Store. The keys of the Store were in the custody of the storekeeper, Mr Dauharry, and no one could enter the Store unless Dauharry himself opened it, or entrusted the keys to somebody else to open the store. In the Department, there were electric bulbs to give light, but no other electric appliances (except, possibly, electric fans). In the Store itself, there was neither light nor any other electric appliances. For the purpose of supplying light to the Department, the defendants (hereinafter called the C.E.B.) set up one Henley Fuse Box (subsequently referred to as Henley I) in the Department. A main cable ran from a nearby transformer fitted with H.R.C. fuses, fed three consumers (The Mauritius Knitwear, the Mauritius Thread Work, and the Jet Industries) on the way, and finally reached Bata which was the last supply point on that line. With the intention of supplying energy either to Bata or to other prospective customers "downstream", they also fitted a second

and independent Henley Fuse Box (subsequently referred to as Henley II) in one of the rooms of the Store. For the sake of convenience, we shall refer to those rooms by the number they bear on the sketch, annexed to the statement of claim, and marked "B". Henley II was never used by Bata, who had no need of it. But as further industries were being set up in the vicinity, the C.E.B. used Henley II as a section fuse to supply energy to those industries.

In March 1972, the C.E.B received an application from a new customer, the Southern Cross, and in April 1972, they received a further application from a second customer, Imprimerie Ideale. To supply energy to those two consumers, the C.E.B. set up a temporary installation consisting of cables run from Henley II which went through bi-metallic connectors to the ceiling of room No.4, and ran thence across room No.3 into the courtyard, from which it reached the consumers by means of a overhead cable. It should be noted that although the wiring was secured to the ceiling along its horizontal path, it hang loose from the ceiling to the top of Henley II. On the 25th May, 1972, the C.E.B. received an application from a third customer, Textiles Industries. This third customer was not supplied directly from Henley II: instead the C.E.B. used the device of installing a tributary line off the cable feeding Imprimerie Ideale, but the result was that any energy supplied to Textile Industries would be added to the load already existing on Henley II.

On the 6th July, 1972, while the Store was unoccupied Witness Lowtun and others were working in the Department, when at about 1.15 p.m. Lowtun heard what he described as a "Boum" or a bang which came from the direction of the room in which Henley II was. About 5 minutes after, he noted wisps of whitish smoke coming through the hardboard partition which separates the Department from the Store: that smoke came from a spot in line with Henley II. He warned the storekeeper, Mr Goder, and rang for the Fire Brigade. Mr Goder in turn called Mr Bigaignon, the Factory Manager, who rushed to the spot, and opened the main door of the Store. He noted that room No.1 was full of blackish smoke, but saw no flames in it. As he could not enter he went to the side-door in room No.3, opened it, and there also he noted smoke, but no flames. He next climbed on to the slab of the Department, and smashed panes of glass between that slab and the higher slab of the Store. From there he could see inside the Store, and noted that there was a glare coming from room No.4, where Henley II was. He vainly tried to put out the fire

by using extinguishers. Shortly after the Fire Brigade arrived, and took over. They were unable to extinguish the fire, which went out in the afternoon after destroying most of the goods inside the Department and the Store as well as doing extensive damage to the building.

The main issue which the Court has to decide is what was the cause of the fire. We agree with Mr Cole that an important step in deciding the cause is to ascertain the point where the fire started. Luckily enough, on that issue all the evidence points in the same direction, and there is general agreement among the experts that the fire started in room No.4. That results clearly from the facts observed by Lowtun and Bigaignon, from the investigation carried out by Mr Cole, and from the damage to the building, which is more considerable in room No.4 than elsewhere.

Now this heavier damage to room No.4 might be explained in two ways: either the fire burnt longer, or it burnt with greater intensity in that room. An examination of the materials legitimately present in each room leads to the conclusion that the fire-load was about evenly distributed in the Store. No one has suggested that wind or an extra supply of oxygen could have fanned the flames in room No.4: indeed its inside position makes that hypothesis unlikely. It follows that if the fire reached greater intensity in room No.4, it could only have been because highly inflammable materials in fairly large quantities had been clandestinely introduced into it. For reasons which we shall give later, we reject that possibility. In our view, the true reason why room No.4 was more heavily damaged than the rest is that the fire started there, burnt longer and reached a greater development there before the Fire Brigade arrived: from that moment it is reasonable to infer that even if they failed to put out the fire, they had at least some effect in damping the flames and diminishing the damage to the structure.

At the start of the case, there were 5 possible causes of fire:

(a) Spontaneous ignition of the materials in the Store;

(b) Some negligence or imprudence on the part of Bata's employees or others, resulting in the fire;

(c) A deliberate criminal act;

(d) An electrical fault arising in Henley II or the electric installation connected to it;

(e) Some other unknown cause which has remained completely unsuspected.

After all the evidence has been heard, we can safely discard hypothesis (a). No one has suggested that any of the materials in the Store could ignite spontaneously, and those experts who examined that question positively ruled out any possibility of spontaneous ignition.

As for hypothesis (b), we are satisfied that the "no smoking" rule in the Store was stringently enforced and applied. All the Bata employees who deponed on that issue were unanimous that no one ever smoked inside the Store. It is also significant that none of the C.E.B. inspectors or workers who visited the Store ever suggested that there was any exception to the rule either on the day of the fire, or on any other occasion At the close of the case there is neither evidence nor indeed suspicion that the fire could have been started by an act of negligence or imprudence.

The defence made a strenuous effort to show that one could not exclude the possibility that the fire was due to a deliberate criminal act on the part of Witness Dauharry. It was most ingeniously submitted that he had not only opportunity, as he was the last man to leave the Store before the fire started, but also a motive, as the evidence tended to show that he had been guilty of embezzling the articles entrusted to his custody.

We agree that he was an unsatisfactory storekeeper, and suspicious entries in his books do not permit us to exclude the possibility that he may have been a petty embezzler. But the evidence as to the security measure concerning the stock rule out large-scale embezzling over a prolonged period.

If, as suggested by the defence, the embezzlement, or at least part of it, was carried out on the morning of the fire, that leads us to an accumulation of improbabilities. We consider that the entries in the C.E.B. Faults Log-book are as questionable as the entries in Dauharry's books, and there is nothing to show that Dauharry did not reach the Store and leave it at the times he states - viz. between 9 a.m. and 11.25 a.m. As it is reasonable to assume that a storekeeper of 15 years' standing does not commit arson to cover a trifling fraud, one must assume that during that time he found means to remove a fairly large amount of goods from the Store, and then complete his preparations for setting fire to it: that would have been a fairly

arduous process if, as suggested, he spread large quantities of plastifix in the room. One must further assume that subsequently he found means of disposing of the proceeds of the fraud without being detected, returned to the factory, resumed work without exciting suspicion and replaced the keys on their stand before the alarm was given.

After carefully considering all the evidence we are satisfied that he was not guilty of arson. We are driven to that conclusion by a convergence of probabilities amounting almost to a certainty, which may be summed thus:

(1) The first factor is the personality and character of Dauharry as revealed by his behaviour in the witness-box and his conduct at all material times. He is not a bold criminal: on the contrary, he is suggestible, easily flustered, and prompt to panick under pressure.

(2) The second factor is to be found in the material circumstances surrounding the fire. It must be remembered that Dauharry had the keys to the store, and could gain access to it at any time of the day or night. If he had summoned the nerve to set fire to the Store, it is highly probable that he would have selected an hour when -

(a) no witnesses able to incriminate him were present;

(b) the fire would have time to burn for long enough and reach sufficient violence to make it impossible to put it out.

We find on the contrary that the fire was started in broad daylight. It is certain that there was no fire in the Store on the morning of the 6th of July until the C.E.B. workmen left. Further, Dauharry from the start admitted that he had been in the Stores until 11.25 a.m. Now everybody knew that the fire had started before 1.20 pm. (which is the time at which Lowtun gave the alert to Goder). Dauharry added that he had locked the Store before leaving. The result is that if there was any suspicion of arson, Dauharry would in effect have been volunteering for the role of Suspect No.1. Even if he had heard of the value of the Double-Cross System, we consider that if he had had a guilty conscience such an audacious bluff would have been thoroughly out of character for him.

Further, Dauharry knew that the C.E.B. men

could give evidence that he had met them at the Store, and had stayed behind in order to lock it, so that they would be likely to give evidence implicating him.

Besides Dauharry was well aware of two facts which might lead to premature detection of the fire. First there were Bata employees working in the Department, next door to the Store, and unless he were a fire expert, he could not work out how soon smoke or smells might penetrate through the partition and give the alarm: there would in consequence be a serious risk that the fire would be discovered and extinguished before it could have achieved its purpose. Secondly, in the period preceding the fire, Dauharry was being repeatedly pestered by the C.E.B. men to unlock the Store to give them access to Henley II. He could not run the risk of their calling in at short notice to repair another fault on the circuit. That risk would be heightened if, as suggested by the defence, he had remained a fairly long time on the spot in order to spread inflammable material in preparation for the crime.

(3) There is also evidence which although negative is not devoid of significance. We know that the Police were on the spot that very afternoon, and that by the next day at latest a Police Enquiry was started by two Senior Police Officers, acting under the supervision of the Forensic Science Laboratory Expert, and in presence of representatives of Bata and of the C.E.B. That Police Enquiry was followed by a Judicial Enquiry, and it must have been clear from the start that very important damage had been caused, and that it was of the utmost importance to determine who was responsible for the fire. Yet no one seems to have been suspected of arson, so that it is reasonable to infer that neither the Police nor the interested parties found on the spot any clue which might have pointed to a criminal act. Further, Mr. Cole, a claims adjuster with considerable experience in fire investigations arrived on the spot on the 10th July, and as from the 11th July proceeded to a thorough inspection of the premises. We are satisfied that Mr. Cole has not merely experience, but also considerable ability in his field, and it is clear from the evidence that he found no clue suggestive of arson.

In analysing the evidence of Dauharry, one must not overlook that through a totally involuntary, but unfortunate error, this witness was the victim of a confusion for which he is not responsible. In cross-examination, Sir Raymond Hein suggested to him that he had previously said

(a) that he was accompanied by a workman named France, and (b) that he had stayed in the Store until 11.55. It is now admitted that Dauharry had never made any of those statements, but when the questions were put to him with Sir Raymond's inflexible politeness, it never occurred to him (any more than it then occurred to the Court) that there might have been a misunderstanding. He obviously assumed that what was suggested to him was a fact which the defence could prove, and that caused him to doubt his memory, and in turn increased his agitation. In analysing some of the unsatisfactory answers which he gave as a result, one must make allowance for the confusion of mind which was induced in him.

Further, it was put to him as suggestive of guilt that in a sketch of materials which he had prepared he had deliberately omitted one single item, which happened to be an inflammable substance called Plastifix, and that the omission tended to show that he had used the Plastifix as a convenient primer to start the fire. Now, two things are clear: the list in question omits many articles other than Plastifix, and in the list attached to the Statement of Claim Plastifix did occur under the name of Plastic Cement. In the circumstances we are satisfied that there was nothing sinister in the omission, and that it in no way indicates a guilty mind on Dauharry's part.

(4) There is a fourth reason which makes us discard any possibility of Dauharry's guilt, and that is the evidence which tends to show that the cause of the fire was electrical. But as that question to a large extent involves a discussion of the electrical installations in and around the Store, we shall reserve it for subsequent treatment.

But before examining that question, it is first necessary to determine the degree of credibility which we may attach to the various witnesses who gave evidence as to the events previous to the fire. That exercise is rendered the more necessary as the very able experts who were called before us sometimes base their deductions on the assumption that the witnesses on their side give an accurate picture of those events. Unfortunately we are unable to share their optimism in all cases.

We have no doubt that several of the witnesses were both honest and accurate: among those one may quote Messrs. Bosquet, Lowtun, Goder, Bigaignon, Bathfield, Huggett, Georgette, Monty and Henri. The position is different when we come to Messrs Hiss, Mamdally, Dauharry,

Jean, Juste, Mungroo, Jupin and Nahaboo. The stories told by those witnesses form an intricate jungle of half-truths, part-remembered facts, and downright inventions in varying proportions: the result is that their evidence which is often in contradiction with their previous statements must be carefully sifted, and, as a rule, cannot be acted upon, unless either it is corroborated by an admission from the other side, or presents such an inherent probability that trust can be placed in re, if not in persona. In the third, and lowest category, we place Messrs. Moosaheb and Chung Choi, whose evidence appears to us thoroughly unreliable. We reserve the case of witness Rosalba for separate consideration.

It appears from the above list that the category of doubtful witnesses includes most of those whose evidence would have been most illuminating, if they could have been thoroughly trusted. For that reason, their evidence must never be dissociated from the expert evidence which will often provide useful pointers as to when their stories ought to be accepted or not. (Reciprocally, any expert opinion founded on doubtful testimony must be discarded).

On the whole we find that the Bata employees tended to exaggerate the electric faults in and around Henley II, while the C.E.B. employees strove hard to minimise those faults: the truth lies somewhere between the two extremes, although on the whole we find the "global" version given by the Bata witnesses tobe more probable than the version of the C.E.B. witnesses.

At this juncture we would like to express our appreciation of the expert witnesses who were called by both parties. They are all men of integrity and learning who showed mutual respect for their opponents with whom they did not always agree, but whose competence in their respective fields they never challenged. They differed as to the conclusions to be drawn from certain sets of facts but did their best to put to the court what in conscience they believed to be the technical aspects of their client's case. We must also praise the patience of those gentlemen who spared no time and effort to guide the court through the uncharted lands we had to cross in order to arrive at the truth.

One thing appears certain to us: from the start the installation of Henley II was marked by crude workmanship.

In the course of his cross-examination Mr Davidson was informed that at the C.E.B.'s request Mr Woodcock had carried out an experiment to

ascertain the earthing system at the transformer and the earth fault loop and measure the resistance. Documents AL and AJ were produced on the same occasion. In document AJ there was the first intimation that the lead sheath and armour of the cable was not bonded to neutral earth at the substation.

Mr Turner on his return from overseas was recalled and examined regarding the earthing as represented in document AJ. He showed his amazement and in no uncertain terms described the installation as a dangerous one for two reasons, firstly as a source of electrocution and secondly as a risk of fire. This witness also explained how one would attain a combined resistance of 61 ohms in the circle and how a leakage current to earth of 4 amps was able to run through poor connections in the system and create arcing and overheating which could be a source of fire.

Such a fault could persist undetected for quite some time. Mr Turner also explained how according to regulations the earth leakage impedence should have been a maximum of 1.35 ohms instead of 61 ohms.

We consider it advisable to reproduce here the following remark of Mr Turner :-

> "We had not previously considered this as a cause of fire because it is known to be a dangerous situation which is always obviated by these regulations which were specifically made by the institution of electrical engineers to avoid such dangers of electrocution and fire."

Mr Woodcock himself agreed with the calculations of Mr Turner regarding the leakage impedence to earth and admitted that a current of 4 amps could be circulating unnoticed.

Mr Sharples was referred to the I.E.E. regulations which specify a minimum binding radius of 6 to 8 times the diameter of the cable and asked whether he agreed that a similar restriction should have been placed on the aluminium cables on the downstream side of Henley II. When those cables (Ex.VIII) were shown to him, his answer was the following:

> "I do not think that the loop and the binding round them represent accurately the actual means of attachment to the external walls of the building. In order to dismantle them the loops must have been undone and have been very casually rewound like that; I cannot believe that that was

the manner in which they were bound to the insulators. I did not see the insulators at the time and I cannot believe that that very casual binding is anything other than a form of retieing the arc of the cables after dismantling. If they were bound like that, it would be a very casual job indeed."

The witness was then asked by the Court to examine the extension cables supplying electricity to the Supreme Court. He made a brave effort to conceal his shock, but could not say more than that the existing wiring shown to him was just like the one produced, but not as bad.

We can only add that to our inexpert eyes our installation looked almost as bad as Exhibit VIII. /C.E.B. please note/.

We also note that even before Textile Industries were linked to Henley II, the system showed a tendency to break down repeatedly. As from the time Textile Industries became operative, the breakdowns occurred with alarming frequency, and ought to have put the C.E.B. on guard. But it is clear that instead of looking for the causes of the break-downs, they were content to treat the systems. It is all very well to say that the purpose of a fuse is to blow in order to protect the system, but when fuses flow so persistently, it is not sufficient merely to replace them: one should investigate to find out why they blow.

What is worse is that the C.E.B. adopted a method of treating the symptoms which consisted in an effort to suppress them rather than to trade the cause of the evil. Thus on the 28th of June, 1972, finding that one of the fuses of Henley II was blown, workman Jupin, (who had no professional qualification) hit on the device of replacing the one 18 S.W.G. fuse wire by two 18 S.W.G. fuse wires.

Here we shall describe what a Henley fuse box was. The box in question contained fuse carriers (one for each phase) and was designed to carry a normal load of 60 amps per phase and the fuse wire recommended for each fuse carrier was a 17 S.W.G. fuse wire, the rating being on the conservative side. The C.E.B. had originally used 18 S.W.G. fuse wires in Henley II; the 18 S.W.G. fuse wire is normally recommended to carry a load of 45-50 amp. per phase. It is worth noting that before blowing a fuse wire can stand 1½ to 2 times the load for which it is recommended. This is called the fusing factor.

The doubling of the fuse wires by the C.E.B. would of course allow a heavier load to pass through without blowing the fuse, but the grave disadvantage of that method was that in future the fuse would not blow even if an excessive load was placed upon it. Jupin duly reported what he had done to Jean, an entry was made in the faults log-book, and Jean, adopting the device as his own, issued directions that whenever a single 18 S.W.G. wire in Henley II should blow, it should be replaced by a double 18 S·W.G.wire. In the course of the eight following days, the two remaining single 18 S.W.G. wires inside Henley II were replaced by double 18 S.W.G. wires. It is highly significant that the last of those replacements was made on the morning of the 6th of July, a few hours before the fire.

In our view Henley II and the Yorkshire cut-outs downstream from it had been emitting distress signals for some time prior to the fire, but those distress signals were ignored by the C.E.B. What occurred to Henley II on the 6th of July was in the nature of an S.O.S., but the response of the C.E.B. can only be compared to that of a doctor who to stop his patient from howling in pain would think of no better treatment than to press a gag on his mouth.

Although, as we have said above, it is not possible to accept the evidence of Hiss and Mamdally unreservedly, yet when what they say is read alongside the faults log-book and in conjunction with admissions made by the workmen, one is led to believe that the Henley II was the victim of sustained and repeated overloading.

It is in this conjunction that a piece of the evidence of Rosalba becomes important. What he says about the condition of the fuse of the Yorkshire cut-out which he repaired on the 1st July distinctly points to overloading, and not to a short-circuit. But although Rosalba was a witness for the defence, it was eloquently urged that his evidence could not be accepted on this point on the ground that he had done numerous such jobs and could not, after nearly six years, remember the details of what was to him only a routine job. Now between us we have half a century's experience at assessing credibility; to that experience - not to put it too high - one may add a few hours' reflexion about the problems related to that exercise. When we are told that Rosalba could not remember the details, our answer is that a distinction must be drawn. If, indeed

he had been doing a large number of routine jobs over six years, and nothing special had occurred to fix his attention to one particular job, we should have viewed with active suspicion his claim to remember the details. But if five days after the event, when the facts were still fresh in his mind, a dramatic event occurred, he would naturally go back over what he had done, so that the facts would become engraved in his memory, and once this has been done there is nothing surprising if he remembers them long afterwards. /Thus one of us once conducted a preliminary enquiry in the case of a taxi-driver charged with involuntary homicide. While the case was pending, the driver was killed almost at the same spot, and in circumstances almost identical to those in which he had killed his victim. Although the case is now over twenty years old, the enquiring magistrate vividly recalls every look, gesture, and word of the accused./ Having thus found that there is nothing inherently improbable in Rosalba remembering the details of the job, we must next ask: does he really remember them?

We are familiar with various classes of witnesses: the deliberate liar, the person who answers recklessly to get rid of an importunate counsel, the person who tries to be honest, but whose memory is at fault, and the person who vividly remembers an incident and gives a true account of it. Our opinion is that on this issue Rosalba, who answered without undue haste or undue hesitation, belongs to the last class, and that his account should be accepted.

One may add that other pointers suggest that the repeated faults which occurred either at Henley II or on the circuits fed from it were due not to short-circuits, but to overloading. In several cases, the blown fuses were replaced, and did not blow again: if the fusing had been due to a short-circuit, in all probability the new fuses would have blown as soon as they were placed in position. In the case of overloading, one may expect the fuses to hold at least for a while, for two reasons: the first is that the overloading which caused the old fuse to blow may have temporarily stopped, and the second is that the fuses being new, might be more robust, and able to bear the strain until they had started in turn to deteriorate.

The oxidisation noted by some of the witnesses and registered in the faults log-book points to the same conclusion.

In this connection, we wish to point out that both the ASTA and ERA tests give valuable information as to the behaviour of fuse-boxes subjected to

excessive currents, and the resulting electrical, chemical and physical phenomena caused by high amperage, with special reference to the heat generated in various parts of the box during those tests. We have accordingly carefully studied those results, and given them the weight which they undoubtedly deserve. All the same those experiments carried out in a laboratory do not give a complete reconstruction of the concrete conditions which existed on the site. In particular, the tests lasted only a few hours, and were not repeated day after day. On the contrary, the installation with which we are concerned was in operation over several weeks, and, especially after Textile Industries came on the scene, was subjected to strain and stresses over a far longer peiod. It is not unreasonable to infer that such strain and stresses would have a cumulative effect which would cause gradual deterioration with effects which in the long run would tend to aggravate themselves. On that view, the behaviour of the fuse-boxes used in the tests would bear the same relation to Henley II on the morning of the fire as the performance of a boxer in the first round to his condition in the fifteenth round after he had received heavy punishment.

On the issue of overloading, we have carefully studied Mr Sharples' brilliant expose on diversity factors. We agree that, as a rule, the principles referred to by him are sound. But they only provide information as to what happens in general, and do not necessarily apply to an individual situation or to a particular group of consumers. For instance, it is obvious that conditions in a going concern where a variety of jobs are distributed among the personnel does not necessarily correspond to what takes place in a new venture where the staff if made up almost entirely of trainees. In the first case, diversity would have full play. But in the second case one may easily visualise an expert teacher putting all the trainees through the same drill at the same time, in order to make them learn one particular aspect of their jobs. In an undertaking like Textile Industries, that might result in the forty trainees operating all the forty installed machines at the same time. We do not say that that occurred, as that would be to speculate. We merely wish to point out that Mr Sharples' theory need not at all times correspond to the facts.

In any case, none of the experts were present at the relevant time, and they can only theorize. But the fuses were there, and by blowing at an alarming rate they supply unquestionable evidence that something was wrong.

We shall now discuss what are in our view possibly the two most significant clues found after the fire: the position of the lid of Henley II on the floor, and the state in which that lid was found after the fire. Before the fire, Henley II was fixed to one of the walls of Room No.4, at a height of about 4 feet above the ground. Near it were various cardboard boxes containing raw materials used by Bata to manufacture shoes. After the fire, the floor of Room No.4 was covered with burnt or partially burnt debris of the raw materials, and about one feet underneath the debris, and lying on a stratum of debris about two feet high Henley II was recovered, but the lid was missing. The lid itself was found about 18 inches further away from the box, lying directly on the concrete floor, and about two feet lower than the box. The debris were sifted, and it was found that the first layer of 12 inches from the floor consisted of partially burnt soles.

It seems to us that the most reasonable inference from the different strata at which the lid and the box were found buried in the debris is that the lid was blown away from the box before the box itself fell to the ground. This is confirmed by a fact which escaped the notice of the experts, and was pointed out to them by the Court. It seems clear that one of the retaining pins of the lid did not melt, but was snapped, and in our view the most reasonable explanation for this condition is an explosion within the box.

The second significant feature of the lid is that a fairly large chunk of its top right hand corner is missing, and presents an intricately serrated edge. None of the theories put forward by the defence seems capable of suggesting an explanation of this phenomenon. We agree that the cast-iron of which the lid is made is brittle, and could break on falling on a hard floor. /We must note, however, that on any hypothesis, it must have been heated to a fairly high temperature before it fell, and that would tend to diminish its brittleness./ But in our view if a fall caused the missing part of the lid to break away, it would have broken along a line of least resistance, and would not have presented the curious indentations which can be observed on the lid in its present state and which appear even better on photos O 44 and O 45. We also reject the possibility that those indentations might have been caused by part of the lid melting while it was on the floor. If the missing part melted on the floor, the police officers who conducted the enquiry, or an astute observer like Mr Cole would have been bound to find some traces

of molten metal in the vicinity. Further, to cause the lid to melt in that way would have required a very high temperature at the level of the floor: if that had been the case, the soles forming the first twelve inches of debris would have been completely consumed, and not partially burnt.

Incidentally the presence of those partially burnt soles is another sign which tends to negative arson. If, as suggested, a highly inflammable liquid had been poured on the floor, the raging flames that would have resulted would have reduced the soles to an unidentifiable heap of ashes.

In our view the irregular dents on the lid very strongly point to uncontrolled arc cutting within the box before the lid blew away. Further, to reduce the lid to its present state, one must infer sustained arcing within the box. Now, if the fire had started at floor level, in the normal course of events the flames would have reached first the bottom cable which ran from the floor to Henley II. That would have quickly destroyed the insulation of the wires inside the cable, thus leading to a short-circuit which would have blown the H.R.C. fuses at the transformer, cutting off the main supply, and putting a stop to all electric activity inside the fuse-box. In other words, there could not have taken place that sustained arcing which we must postulate to explain the state of the lid.

We consider that the only explanation which takes all the proved facts into account is the following:

(1) the overwiring of the fuses in Henley II permitted overloading which in turn led to overheating of the cables and of the metallic parts of the fuse-box.

(2) This overloading, occurring repeatedly over a prolonged period led to a gradual deterioration of the contacts and other components inside the box.

(3) This in turn would increase contact resistance and lead to higher temperatures than would have occurred if the contacts were clean.

(4) As a result of accelerated deterioration of the system, the combined build-up of ionized gases and high temperatures inside the box would bring about a runaway condition.

(5) One effect would be sustained arcing within the box.

(6) The reprehensible way in which the fuse-box was earthed would permit at the outset a low amperage arcing within the box going on undetected.

(7) The pressure caused by the ionised gases at high temperatures would build up until it was strong enough to blow off the lid.

(8) That lid itself, as shown by the damage it suffered from the arcing, would by then have reached such a high temperature that when it was blown off, part of it would have evaporated in a fine shower of incandescent particles, while the bulk of it would be in a molten state and would set fire to the cardboard boxes or any other inflammable material on which it would land.

(9) It is probable, although not certain, that the bang heard by Lowtun was caused by the lid being blown off.

(10) The broken pin also supports the theory that the lid was violently blown off its moorings.

The above reconstruction adequately accounts not only for the indentations on the lid, but also for the fact that it was found on the floor, in a lower stratum, and further away from the wall than the rest of the box. /The suggestion of Mr Sharples that the lid might have been washed to the spot where it was found by the firemens' hoses appears to us unrealistic: it savours less of an attempt to deduce a theory from the known facts than of an effort to force the facts to suit a preconceived theory./

But it was said that there are three pieces of evidence which are incompatible with the theory that the fire was started by an electrical fault within Henley II. Those pieces of evidence are that after the fire had started and the alarm was given -

(a) the lights went on in the Department until Goder switched them off;

(b) the lights and machinery went on at Imprimerie Ideale for about ten minutes afterwards;

(c) the lights, and possibly the machines, went on at Textile Industries.

We find it proven that the lights were on in the Department as stated in (a) above. But in our view that is perfectly reconcilable with our conclusions. For the lights in the Department depended on an independent fuse-box (Henly I), "upstream" from Henley II. The fault we have in mind would not prevent the current from reaching Henley I until the H.R.C. fuses on the transformer had blown.

On the other hand, if the facts recited in (b) and (c) were proved, we should have felt bound to look for some other explanation. In our opinion the fault in the box was bound to prevent the three-phase motor in Imprimerie Ideale from working in the way claimed, and in spite of Mr Turner's ingenious explanation, it is probable that the lights as well would have gone out. But we need not pursue the matter further, for we have no hesitation in rejecting the evidence of Witness Mosaheb. Early in his cross-examination he deliberately tried to deceive the Court by asserting that there never was an electric welder at Imprimerie Ideale. But what showed him as a clumsy liar in his claim that after people were shouting "Fire" at a distance of less than 20 yards from his workshop, and smoke was already coming in, he went on working with complete unconcern. Now cries of "fire" raise a primeval fear and curiosity in almost all human beings, and in Mauritius in particular. We have seen and heard Mosaheb, and are completely unable to visualise him in the stance of the boy on the burning deck - although in his case his splendid isolation would have been slightly marred by the fact that he was surrounded by a bevy of workers as intrepid, and incurious, as himself.

Witness Ah Chung Choi was a rather more cautious liar, but after closely watching his demeanour in the box we have come to the conclusion that his evidence is equally unacceptable. He had been employed at Textile Industries since the 21st of June, and he claims that up to the date of the fire there was no outside electrical fault requiring them to call in the C.E.B. Yet we know that in fact they were called at least on the 27th and 28th of June, as well as on the 1st and 5th of July, and on the morning of the fire. He also makes a claim to the same iron nerves as Mosaheb: when he heard people call "Fire", he went out, saw the fire, glanced at it, and returned to his office, where he (very conveniently)observed that the lights went on burning. We may also note that he apparently never gave a statement concerning that important bit of evidence prior to December, 1977.

There are two final clues which confirm us in our view that the fire was caused by an electrical fault: the date and the time of the fire. First the fire occurred on the day that the last single 18 S.W.G. wire was replaced by a double 18 S.W.G. wire, viz, when all the conditions for overloading had reached their peak. Secondly, the fire started soon after the three consumers supplied by Henley II had resumed work after the lunch break, so that a fresh strain would be imposed on the system which as we have found, had been giving signs of imminent break-down. If Dauharry had picked that very day to set fire to the Store, one would have to credit him either with a knowledge of electrical faults which he gave no sign of possessing, or with remarkable luck in choosing the time for his crime.

We accordingly conclude that the fire was caused -

(a) by electrical faults connected with Henley II

(b) that those faults themselves were the result of faulty procedures (notably the overwiring and its consequences, the bad earthing, etc.) combined with the negligence of the C.E.B.'s servants and their failure to treat the causes rather than the effect of the repeated break-downs.

Having been able to ascertain a definite cause for the fire, there is no longer any need for us to examine hypothesis (e) - viz. that the fire was due to an unknown cause.

We have asked ourselves the question whether the unauthorised use of an electric welder by Imprimerie Ideale would be any defence to the C.E.B. /Incidentally, this unauthorised user may partly account for the attitude adopted in Court by Messrs Razack and Mosaheb/. Apart from the fact that it had not been pleaded, we are clear that this is not a case where the fault of a third party can be set up as a defence. As we have seen, the repeated break-downs gave ample warning to the C.E.B. that their installation was not working properly. They made no effort to investigate the causes of the break-down, and for this failure they must be held responsible. In any case, there is no reason to believe that the welder was more than a minor and occasional contributory cause of the persistent overloading, and at the most, if a fault were established against Imprimerie Ideale, the C.E.B. would be entitled to claim a minor contribution from them. But that

would not prevent them from being liable in solidum to Bata.

We therefore find that the plaintiffs have established -

(a) that there was a fault committed by the defendant;

(b) that as a direct consequence of this fault, damage was caused to the plaintiffs;

(c) that the defendant is bound to compensate the plaintiffs for the damage caused.

Now the acts of negligence relied upon were contained in paragraph 7 of the Statement of Claim, and we find that subparagraphs 2, 3 and 4 were proved as averred. But the defendant asked for further particulars of the negligence averred, and in his very able argument learned counsel for the defendant has raised a technical objection to the effect that the answers supplied with reference to subparagraph 1 did not, in view of the evidence, establish any fault. It is true that the plaintiffs did state this in their answers: "the excess loads allowed to be imposed on the Henley fuse-box were in excess of 60 amps/phase and the potential excess loads allowed by the defendant to be imposed were of the order of 79 amps/phase."

We note at once that this answer contains two averments (a) that the loads were in excess of 60 amps/phase, (b) that they were of the order of 79 amps/phase. Now the first part clearly raised the issue of overloading, and from the start learned Counsel for the plaintiffs made it clear in his opening speech that he intended to fight the case on the basis of overloading. Abundant evidence was led to establish the nature and extent of this overloading, and at no time was any objection raised that the plaintiff was going beyond his pleadings. On the contrary, the defendant clearly faced the issue, and did its best to rebut the plaintiff's evidence. It would be a parody of justice if at the end of this interminable and highly complicated suit we were to base our decision on such a technicality. The injustice would be even greater when one bears in mind that the figure of 79 amps was apparently based on information supplied to the plaintiffs by qualified servants of the defendant.

Having reached the conclusion that the defendant is liable for its negligence and that of its servants in terms of aa.1382 & 1383,

C.Nap., and of that part of a.1384 which deals with the liability of employers for their servants' acts, there is strictly no need for us to enquire whether it is also liable as "gardien de la chose" under a.1384. We shall say merely this: for the purposes of the present case we shall assume that we are bound by Mangroo v. Dahal (1937) M.R.43. But we note that one of the reasons why the Court in Mangroo v. Dahal refused to follow the Cour de cassation was that at the time the jurisprudence of that Court still met some resistance from some Courts of Appeal in France and from some learned commentators, and our Court held that in view of the existing controversy it was free to adopt its own interpretation of the enactment. Forty years have elapsed since, and the opinion of the Cour de cassation is now unanimously accepted by all Courts in France and by all commentators. The result is that in adhering to Mangroo v. Dahal regardless of what has taken place elsewhere we are driven to make the invidious claim that everybody is out of step except us. In the circumstances, we are not prepared to stray further away from the mainstream of the jurisprudence by extending Mangroo v. Dahal beyond what is expressly decided. Now although the judgment is 53 pages long all it says is this: When a motor-vehicle driven by a human being causes damage to a person or to property, the victim cannot recover unless he proves some fault against the driver under a.1382 or 1383; it is not permissible to rely on a.1384 and make the custodian responsible merely by proving that the damage was caused by the vehicle.

Obviously the ratio decidendi does not apply to a case like the present. The fuse-box was not being directly manipulated by a human being at the time the fire started. The damage was caused by "un vice inherent a la chose", and a.1384 clearly makes the custodian of the fuse-box responsible to the victim.

We are now left with the question of damages. Thanks to the spirit of understanding and conciliation shown by learned counsel on both sides, what might have been a prolonged controversy can be immediately disposed of. It has been agreed that if liability was proved, the defendant should pay Rs 860,000 to the first plaintiff, and RS 1,035,000 to the second plaintiff.

We accordingly order the defendant to pay Rs 860,000 to the first plaintiff, and Rs 1,035,000 to the second plaintiff.

It follows from the above that the defendant would be liable to indemnify the plaintiffs in

In the Supreme Court

No.55
Judgment

12th June 1978

(continued)

respect of any claim by their landlord arising out of the fire. The defendant will pay the costs of the case.

(Sd) M. RAULT
Chief Justice

(Sd) P. de RAVEL
Judge

12th June, 1978

No.56
Application for Leave to Appeal to Her Majesty in Council: Judgment

14th July 1978

No. 56

APPLICATION FOR LEAVE TO APPEAL TO HER MAJESTY IN COUNCIL: JUDGMENT

Record Nos.31103 and 21136

IN THE SUPREME COURT OF MAURITIUS

In the matter of :-

BATA SHOE COMPANY (Mauritius) LTD. & ANOR.

Plaintiffs

v.

THE CENTRAL ELECTRICITY BOARD

Defendant

A N D

In the matter of :-

THE CENTRAL ELECTRICITY BOARD

Applicant

v.

BATA SHOE COMPANY (Mauritius) LTD. & ANOR.

Respondents

A N D

In the matter of :-

BATA SHOE COMPANY (Mauritius) LTD. & ANOR.

Plaintiffs

v.

THE CENTRAL ELECTRICITY BOARD

Defendant

A N D

In the matter of :-

THE CENTRAL ELECTRICITY BOARD

Applicant

v.

BATA SHOE COMPANY (Mauritius) LTD. & ANOR.

Respondents

In the Supreme Court

No.56
Application for Leave to Appeal to Her Majesty in Council: Judgment

14th July 1978

(continued)

JUDGMENT

of C.I.Moollan (Ag.Chief Justice)
V.J.P. GLOVER (Judge)

The plaintiffs sued the Defendant before this Court claiming damages for prejudice suffered as a result of a fire which broke out on their premises. They claimed interest from the date of entry of the action to the date of judgment, interest from the date of judgment to the date of payment, and costs.

At a certain stage of the proceedings counsel on both sides informed the Court that the parties had agreed that, if judgment went in favour of the plaintiffs, the amounts to be awarded as damages should be in the sum of Rs 860,000 for plaintiff No.1 and Rs 1,035,000 for plaintiff No.2.

It is accordingly not disputed that the question of interest from the date of the fire to the date of judgment has, by necessary implication, been settled.

The trial Court eventually ruled that the Defendant was liable in damages and on the 12th June, 1978 gave judgment for the plaintiffs in the respective sums agreed to by the parties.

On the 26th June, that is within the time limit of 21 days provided by the Mauritius (Appeals to Privy Council) Order 1968 (in this judgment referred to as "the Order"), the appellant applied for leave to appeal against the judgment to Her Majesty in Council. The matter was called before the Chief Justice (Rault C.J.) and Glover J. and, after the respondents had, through their counsel, indicated that the motion was not opposed, the Court indicated that the motion would be granted and that the necessary written order would be made in due course.

On July 3rd, before judgment had been delivered

and filed in the application referred to above, the respondents moved that the Court should, in the exercise of its powers under sections 5 and 6 of the Order -

(i) make an order allowing interest on the sums awarded from the date of judgment of the Supreme Court to the date of judgment of the Privy Council in case the decision of the Supreme Court be maintained;

(ii) in the alternative reserve for determination of the Privy Council in case the judgment of the Supreme Court is maintained, the decision as to whether interest should be paid from the date of the judgment of the Supreme Court to the date of judgment of the Privy Council.

The affidavit in support of the application recites that (a) the appeal to Her Majesty in Council is unlikely to be finally determined before quite a long time and (b) great prejudice will in the meantime be caused to the respondents.

That application was made before Rault C.J., and Moollan S.P.J., (as he then was). Counsel for the appellant prayed for time to consider his stand and the matter was adjourned to July 10th.

On July 10th the matter came before Moollan AG.C.J., sitting alone, and counsel for the appellant indicated that the application (regarding interest) was resisted. We should point out that, as the office of Governor-General had become temporarily vacant, the Chief Justice (Rault C.J.) had, on July 8th, assumed office as acting Governor-General by virtue of section 29 of the Constitution of this Country.

When both applications were again called on the 13th July, that is yesterday, the Court was composed of Moollan Ag. C.J., and Glover J. By consent of parties, it was the Court as so constituted which undertook to dispose finally of the application for leave to appeal and also heard argument on the merits of the application regarding interest. We propose to deliver one judgment in both matters, as we are of the view that it is quite in order to proceed in this way. We do not, in Mauritius, have the equivalent of the English Order 4 Rule 8 (Annual Practice 1976 R.S.C. 4/8 which takes care of some of the problems which may arise in such a situation. There is ample authority regarding the English practice in cases where a Judge dies after partially hearing a case /See Halsbury, Laws of

England, 3rd Ed. Vo. COURTS at p.356 and in particular The Forest Lake 1967 2 W.L.R. 13 and the other cases referred to therein7. We see no reason for not adopting a similar attitude in cases where a Judge retires or is, as in the case of the Chief Justice, temporarily unavailable to sit on the Bench. This Court has, by section 15 of the Courts Ordinance (Cap. 168), all the powers vested in the High Court of Justice in England and it has also constantly held that, when our laws are silent on a point of practice, it will follow the English practice.

The appellant is, by virtue of section 81(1)(b) of the Constitution, undoubtedly able to go on to appeal to Her Majesty in Council as of right. We now have to consider the application regarding interest. It was said, in the motion paper, as we have seen, that we may grant one of the two prayers under sections 5 and 6 of the Order. Section 6 provides that, when granting leave to appeal to Her Majesty in Council, this Court may either direct that the decision of the trial Court shall be executed (the winning party being required to give adequate surety in case it eventually loses) or that execution thereof shall be suspended. It seems quite clear to us that this section, worded as it is in very clear terms, gives this Court two alternatives, and two alternatives only, in relation to the decision of the trial Court. Now the decision of the trial Court related to the payment of certain agreed sums of money as damages and of the costs of the case. Learned Counsel for the respondents conceded at the hearing that we cannot, on the strength of that section, make an order relating to interest which may accrue after the decision of the trial Court has become executory.

With regard to section 5, counsel for the respondents indicated that he was relying on paragraph (b) thereof which empowers a single judge of the Court -

> (b) generally in respect of any appeal pending before Her Majesty in Council to make such order and to give such other directions as he shall consider the interests of justice or circumstances of the case require.

The first point which occurs to us is that this paragraph deals with incidental matters which may arise when the appeal is pending. These may relate, inter alia, to the preparation of the record, the correction of errors in the trial court's record (a point already alluded by counsel and by the Chief Justice at one of the earlier sittings), the

furnishing or replacement of security. But it seems to us that those are powers which are to be exercised after leave to appeal has been granted and the condition as to furnishing security has been fulfilled. We have observed that whilst in section 6, the words used are "the Court shall have power, when granting leave to appeal, either to direct.....", the language of section 5 refers to matters "in respect of any appeal pending before Her Majesty in Council". We are accordingly of opinion that the respondents' application cannot be granted under section 5 either.

But let us go a step further and look at the merits of the application. We think that prayer (ii) should not be considered in any event. It is not our province to make any order which is in the nature of a directive to the Judicial Committee. Whether or not the respondents are entitled to apply to the Committee for an order relating to the payment of interest and, having so applied, are entitled to the relief prayed for is a matter to be determined by the Committee and not by us.

With regard to prayer (i), we have also formed the opinion that it should not in any event be granted.

In Boulanger v. Martin (1880) M.R. 13, the winning party in a suit in respect of which an appeal was pending before Her Majesty in Council under the provisions of an earlier but similar Order in Council, moved this Court for an order to provisionally execute the judgment by ordering the losing party to deposit in the Registry "such a sum as the Master shall report to be the balance of account due by defendants on the remit made to him the said Master for the recasting of his report as per directions contained in the judgment of the Court".

The Court had this to say :

" By the terms of the Royal Order we are empowered either to authorise the plaintiffs on finding security to perform the judgment of the Privy Council to execute the judgment of this Court, that is to enforce it, as if no appeal has been allowed; or, on security being found by the defendants, to direct that the judgment of this Court shall not be carried into execution, but that pending the appeal, things shall remain as if the judgment had not been pronounced. But the application now before us does not ask us to adopt either of these alternatives."

.....

" We are satisfied that what the plaintiffs ask us to do is not to follow one of the two alternative courses clearly defined by the Royal Order, either of which we are empowered to adopt, but to steer a middle course for taking which there is no warrant to be found in the Royal Order. As our powers are limited to exercising the discretion vested in us by that enactment, we must accordingly refuse the application as now made."

Another decision which has also assisted us in reaching our conclusion is referred to in the English and Empire Digest Vol.16, Vo. COURTS at p.162, in Note 304 of the Scottish, Irish and Commonwealth Cases, as follows -

" If a party is entitled to appeal to the Privy Council as of right, that is upon only such conditions as the rules prescribe."

We accordingly grant leave to the appellant to appeal to Her Majesty in Council against the judgment delivered by this Court on the 12th June, 1978, in the suit between the parties on condition that -

(a) the appellant shall not later than the 31st August, 1978 enter into good and sufficient security to the satisfaction of this Court in the sum of ten thousand (10,000) rupees for the due prosecution of the appeal and the payment of all such costs as may become payable by the appellant in the event of the appeal being dismissed for non-prosecution or of the Judicial Committee ordering the appellant to pay the costs of the appeal, as the case may be; and

(b) the appellant shall within six months from the date of this judgment procure the preparation of the record and the despatch thereof to England.

Costs of these two applications to be costs in the cause.

A copy of this judgment will be filed in each record.

(Sd) C.I. MOOLLAN
Ag. Chief Justice

(Sd) V.J.P. GLOVER
Judge

14th July, 1978.

In the Supreme Court

No.57
Order granting Conditional Leave to Appeal to Her Majesty in Council

14th July 1978

*sic

No. 57

ORDER GRANTING CONDITIONAL LEAVE TO APPEAL TO HER MAJESTY IN COUNCIL

IN THE SUPREME COURT OF MAURITIUS

On Friday 14th July 1978.

Before Hon. C.I.Moollan, Ag. Chief Justice and Hon. V. Glover, Judge *21103 & 21136 - THE C.E.B. v. BATA SHOE CO. (MTIUS) LTD & ANOR

M. David Q.C. together with J.Piat for the Respondent.

The judgment of the Court is read out and filed of record (Hon. C.I.Moollan, Ag. Chief Justice and Hon. V.Glover, Judge).

The Court grants leave to the appellant to appeal to Her Majesty in Council against the judgment delivered by this court on the 12th June, 1978 in the suit between the parties on condition that :

(a) the appellant shall not later than the 31st August, 1978, enter into good and sufficient security to the satisfaction of this Court in the sum of ten thousand (10,000) rupees for the due prosecution of the appeal and the payment of all such costs as may become payable by the appellant in the event of the appeal being dismissed for non-prosecution or of the Judicial Committee ordering the appellant to pay the costs of the appeal, as the case may be; and

(b) the appellant shall within six months from the date of this judgment procure the preparation of the record and the despatch thereof to England. Costs of these two applications to be costs in the cause.

(Sd) A.Y. IP HEE WAI
for Master and Registrar

No. 58

REGISTRAR'S CERTIFICATE
dated 23rd August 1978

In the Supreme Court

No.58
Registrar's Certificate dated 23rd August 1978

S.C.R. 19194

IN THE SUPREME COURT OF MAURITIUS

In the matter of :-

Central Electricity Board acting by and through its Chairman Mr Maurice Paturau (Applicant) versus 1. Bata Shoe Company (Mauritius) Ltd., acting by and through its Board of Directors and having its registered office at Plaine Lauzun, Port Louis. 2. East Africa Bata Shoe Company Ltd. (Mauritius Department) acting by and through its Board of Directors and having its registered office at Plaine Lauzun, Port Louis (Respondents)

BE IT REMEMBERED that the Central Electricity Board acting by and through its Chairman Mr Maurice Paturau, hereby acknowledge to be indebted to the Respondents in the sum of Rs 10,000 (ten thousand rupees) and which has been duly deposited in cash this day with the Cashier of the above Court (CB No.794 of 22.8.78).

WHEREAS on the 12th day of June 1978, judgment was given by the above Court ordering the Applicant to pay Rs 860,000 (eight hundred and sixty thousand rupees) to the first Respondent and Rs 1,035,000 (one million and thirty five thousand rupees) to the second Respondent, and to be liable to indemnify the Respondents in respect of any claim by their landlord out of the fire, and to pay the costs of the case.

AND WHEREAS by a judgment of the above Court made on the 14th July 1978, it was adjudged that the Applicant should have leave to appeal to Her Majesty in Council against the judgment delivered by this Court on the 12th June 1978, in the suit between the parties on condition that -

(a) the Appellant shall not later than the 31st August 1978, enter into good and sufficient security to the satisfaction of this Court in the sum of ten thousand rupees (Rs 10,000) for the due prosecution of the appeal and the payment of all such costs as may become payable by the appellant in the event of the appeal being dismissed for non-prosecution or of the Judicial Committee ordering the Appellant to pay the

In the Supreme Court

No.58
Registrar's Certificate dated 23rd August 1978

(continued)

costs of the appeal, as the case may be, and

(b) the Appellant shall within six months from the date of this judgment procure the preparation of the record and the despatch thereof to England.

NOW the conditions of this obligation are such that in case the abovenamed Applicant do prosecute the above appeal and in case the abovenamed Applicant do pay all costs that may become payable to the Respondents in the event Applicant not obtaining an order granting him final leave to appeal or the appeal having been dismissed for non-prosecution or of the Judicial Committee of the Privy Council ordering the Applicant to pay the costs of the appeal (as the case may be) then this obligation to be null and void, otherwise to remain in full force and value.

Good for the sum of ten thousand rupees (Sd) ?

TAKEN AND ACKNOWLEDGED by and before me after the Applicant has satisfied me that he has this day deposited cash with the cashier of the above Court the above amount of Rs 10,000 (CB No.794 of 22.8.78).

Chambers.Court House, Port Louis, this 23rd day of August, 1978

(Sd) A.M.G. AHMED - Master and Registrar, Supreme Court.

Registered at Mauritius on the 24th day of August 1978. Reg. C 318 No.2110.
(Sd) Jean Pierre

No. 59

ORDER GRANTING FINAL LEAVE TO APPEAL TO HER MAJESTY IN COUNCIL

IN THE SUPREME COURT OF MAURITIUS

On Wednesday the 10th of October, 1979 in the 28th year of the reign of Queen Elizabeth II

In the matter of :-

The Central Electricity Board Applicant

v.

1. Bata Shoe Co. (Mauritius) Ltd.
2. East Africa Bata Shoe Co.Ltd.

Respondents

UPON hearing R. Hein Q.C. of Counsel for the applicant, C.P. Ruchpaul replacing M. David Q.C. of counsel for the respondents; and after consideration;

IT IS ORDERED that FINAL LEAVE BE and same IS HEREBY GRANTED to the Applicant to appeal to Her Majesty's Privy Council against the judgment of this Court delivered in the above matter.

BY THE COURT

Sd. (V.Koolomuth)
for Master and Registrar

Registered at Mauritius on the 23rd October 1979
Reg B 122 No. 3482

A true copy

Master and Registrar, Supreme Court.

IN THE PRIVY COUNCIL No. 36 of 1979

ON APPEAL

FROM THE SUPREME COURT OF MAURITIUS

BETWEEN:

THE CENTRAL ELECTRICITY BOARD	Appellants (Defendants)
- and -	
BATA SHOE COMPANY (MAURITIUS) LIMITED	1st Respondents (1st Plaintiffs)
- and -	
EAST AFRICA BATA SHOE COMPANY LIMITED (MAURITIUS DEPARTMENT)	2nd Respondents (2nd Plaintiffs)

RECORD OF PROCEEDINGS

VOLUME II

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