

IN THE HIGH COURT OF JUSTICE
CHANCERY DIVISION
PATENTS COURT

Royal Courts of Justice, Rolls Building,
Fetter Lane, London, EC4A 1NL

Date: 29/01/2016

Before:

THE HON. MR JUSTICE BIRSS

Between:

**UNWIRED PLANET INTERNATIONAL
LIMITED**

Claimant

- and -

(1) HUAWEI TECHNOLOGIES CO., LIMITED
**(2) HUAWEI TECHNOLOGIES (UK) CO.,
LIMITED**
(3) SAMSUNG ELECTRONICS CO., LIMITED
(4) SAMSUNG ELECTRONICS (UK) LIMITED

Defendants

- and -

UNWIRED PLANET, INC.
UNWIRED PLANET LLC

Ninth Party
Tenth Party

- and -

TELEFONAKTIEBOLAGET LM ERICSSON

Eleventh Party

Richard Meade QC, Isabel Jamal and Janni Riordan (instructed by **EIP Europe**) for
Unwired Planet

Daniel Alexander QC and James Abrahams (instructed by **Powell Gilbert**) for **Huawei**
Mark Vanhegan QC and Nicholas Saunders (instructed by **Bristows**) for **Samsung**

Hearing dates: 2nd, 3rd, 4th, 7th, 9th, 10th, 14th and 15th December 2015

Judgment

Mr Justice Birss :

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Introduction

1. This is another judgment in a mobile telecommunications patent case involving Unwired Planet as claimant and Samsung and Huawei as defendants. It arises from the second of five technical trials scheduled to take place between 2015 and 2016. All six technical trials relate to Unwired Planet’s patent portfolio, most of which it obtained from Ericsson. In the context of the wider dispute between the parties, this trial is referred to as “Trial B”. The judgment in the first technical trial (“Trial A”), [2015] EWHC 3366 (Pat), was handed down in November 2015. The issues in the two trials are entirely distinct.
2. Trial B concerns two patents, EP 2 119 287 (287) and EP 2 485 514 (514), both entitled “Self configuring and optimisation of cell neighbours in wireless telecommunications networks”. 514 is a divisional of 287. The patents are based on an original application filed on 28th February 2007. No earlier priority is claimed. The patents were granted on 13th November 2013 (287) and 18th December 2013 (514).
3. The patents are concerned with a scheme relating to neighbour cell lists. In fact some of the claims may be broader than that but the case has focussed on this aspect and it is convenient to consider it in those terms. A neighbour cell list is a list relating to one cell which identifies the neighbouring cells in a cellular network.
4. Telecommunications networks are comprised of a large number of cells. Each cell has a base station connected to the overall network on the land side. The mobile telephones transmit and receive radio signals to and from the base station. In the recent standards the phones are referred to as the “User Equipment” or UE. I will use the word “phone”, recognising that in modern telecommunications networks some UEs are not phones at all. For the purposes of this case that does not matter.
5. The identity of cells can be characterised by different “identifiers” which may be unique or non-unique. Broadly the difference between non-unique and unique identifiers is obvious. As the name suggests a unique identifier is one which distinguishes each cell from every other possible cell whereas a non-unique identifier does not. One might wonder why anyone uses non-unique identifiers at all but there are good reasons for it.
6. In order to illustrate the point, imagine a simplistic example of a cellular system in which the base station in a cell transmits its main control channel on a given frequency and in which there are 30 possible frequencies which may be used. The operator will plan the cells in the network so that adjacent cells always use different frequencies. If each cell has no more than six neighbours (imagine a simplistic hexagonal arrangement of cells), then with luck and careful planning the availability

of 30 possible frequencies will be enough to avoid problems. Across the network as a whole, with hundreds of cells, these frequencies will be reused many times and so the frequency cannot uniquely identify the cell. The network as a whole will no doubt use a serial number to uniquely identify each cell but, from the point of view of a given cell, the base station control channel frequency is sufficiently unique in its local environment to unambiguously identify each neighbouring cell. A phone in a cell can readily detect the neighbouring cells by tuning its radio receiver to the right frequency and a phone can be instructed which neighbouring cell to connect to by being told which frequency to tune to. So the frequency in this example is a simple and practical way of unambiguously identifying neighbouring cells locally. This kind of identifier can be called a PCI or physical cell identifier. In a CDMA system like UMTS (3G) the PCI is a primary scrambling code (PSC) rather than a frequency but the principle is the same. In the LTE (4G) system the PCI is a synchronisation code.

7. A useful neighbour cell list can be simply a list of PCIs. The fact they are strictly non-unique does not matter. In this simplistic example neither the phone nor the base station needs to know what the unique serial number of the neighbouring cell is. A cell might broadcast its unique serial number in its control channel but a phone wanting to read the unique serial number would necessarily already have had to find out the control frequency or other PCI on the way to doing so. Therefore obtaining such a unique serial number will always be a more involved exercise than obtaining the PCI (there is a dispute about how much more effort is really required and its significance).
8. The invention described in the patents operates in the following way. A list of neighbour cells for a base station is stored in the network. However local circumstances around this first base station might change so that new neighbours come to light. One example could be that a building has been demolished so that the signals from a nearby base station which were hitherto blocked by the building are now strong and high quality in the first base station's cell. Another example is that an entirely new base station has been installed nearby and it has started working. In both examples the new base station is not on the first base station's neighbour cell list but is or has become a feasible neighbour to which phones could be handed over. The invention allows the first base station to update its neighbour cell list taking into account these new neighbours. It allows the network to configure itself in that respect. This sort of thing did not happen in GSM (2G) or UMTS (3G). The neighbour cell lists were provided to base stations from the network.
9. In the LTE (4G) system base stations (called eNode Bs) are all present in an IP network and they can have direct connections between one another in order to facilitate handover. These are called transport connections and operate across the X2 interface in LTE. In order for one eNode B to set up such a transport connection to another, it needs to know the IP address of the neighbour and to find that out it uses the unique identifier.
10. The patents require the mobile phone to "determine parameters for the surrounding cells", such as by measuring the transmission power and quality of the surrounding cells it can detect. When the phone reports these to the base station the relevant non-unique identifiers are used to identify the cells. If the mobile phone reports a non-unique identifier to the base station that is not on the base station's list of neighbouring cells, the base station instructs the mobile phone to retrieve the unique

identifier of the neighbour cell. The mobile phone retrieves the unique identifier and transmits it to the base station. The base station can use the unique identifier to find out the IP address of the new neighbour, set up a new transport connection to that neighbour and can update its list of neighbour cells accordingly.

11. The patents have been declared as essential to the LTE 4G telecommunications system. Unwired Planet alleges that Huawei and Samsung infringe the patents by manufacturing and selling equipment that operates in accordance with the LTE standard specified in 3GPP TS 36.300. The relevant functionality is referred to as “Automatic Neighbour Relations” or “ANR”. Unwired Planet contends that the patents are essential to the standard and, therefore, Huawei and Samsung’s compliance with the standard means they infringe. By the closing there was no dispute that for any of the claims alleged to be independently valid by Unwired Planet, if that claim is valid then it is infringed and essential to the standard.
12. Huawei and Samsung argue that the patents are invalid. Before trial the arguments advanced by the defendants differed to some extent but by the closing they were identical. The defendants’ grounds of invalidity narrowed very significantly in the period up to trial. A number of citations were dropped just before trial. Citations which had been relied on but were dropped were two versions of the 3G RRC Protocol Specification (Release 1999), being 3GPP TS 25.331 v3.3.0 and v3.4.0, and two patent applications WO 02/43430 (Jansson) and WO 99/17571 (Olofsson)
13. The case at trial focussed on obviousness over two starting points:
 - i) Document R2-062303 (“Qualcomm”) which had been proposed by Qualcomm as part of the LTE standardisation discussions. It was presented to the 3GPP TSG-RAN WG-2 meeting #54 which took place in Tallinn, Estonia between August 28-September 1 2006.
 - ii) Common general knowledge alone.
14. There are also the following further allegations which need to be addressed:
 - i) *Sufficiency*. To the extent that the patent is found to be non-obvious, Huawei and Samsung argue that the patents merely teach the concept of using the phone to read the unique identifier and report it back to the serving base station. This assumes that the skilled addressee has sufficient skill to produce a whole system in order to put the invention into practice. Huawei and Samsung allege that, if the skilled team could not produce that system on the basis of the prior art and common general knowledge (or on the common general knowledge alone) then the patent must be insufficient in this respect.
 - ii) *Added matter*. This is alleged in respect of the unconditionally amended claims 11 and 17 of 514, and the claims which are dependent on them.
 - iii) *Lack of clarity*. Samsung and Huawei allege that the following amended claims lack clarity:
 - a) claim 1 of the conditionally amended claim set of 287;

- b) claims 1 and 6 of the conditionally amended claim set for 514.

The claims

15. Annexes 1, 2, 3 and 4 set out the four sets of claims which were live at trial. Annexes 1 and 2 are the claims of 287 and 514 respectively which Unwired Planet seek by way of unconditional amendment. Unwired Planet does not seek to maintain the patents with claims in their granted form. Annexes 3 and 4 are conditional amendments sought by Unwired Planet to 287 and 514 respectively. Although other amendments had been sought during the proceedings, the narrowing of the issues led to further proposed sets of claims being unnecessary from Unwired Planet's point of view.
16. Unwired Planet alleges that claims 1, 6, 7, 12 and 16 of 287 and claims 1, 2 and 6 of 514 are independently valid.
17. It is convenient to focus on claim 12 of the unconditional amendments set for 287 (annex 1). If that claim is obvious then that conclusion applies to all the claims in issue. If that claim is not obvious then that result applies to all relevant claims save for two allegedly wider claims. The two allegedly wider claims are unconditional claim 1 of 287 and unconditional claim 1 of 514. In the end it did not prove necessary to consider them.
18. Unconditional claim 12 of 287 is set out below without reference numerals. The defendants labelled the integers to identify them:

Claim 12

- A A method for controlling resources in a wireless telecommunications system which defines a plurality of communications cells, the method comprising:
- B communicating with a mobile terminal operating in a first communications cell;
- C receiving non-unique identifier information and parameter information relating to at least one operating parameter for a second communications cell from the mobile terminal; and
- D defining a neighbour cell list for the mobile terminal, the neighbour cell list including the second communications cell,
- wherein the method further comprises:
- E determining, from the non-unique identifier information, whether unique cell identity information is required for the second communications cell; and, if such unique identity information is required:
- F transmitting an instruction to the mobile terminal;
- G receiving unique cell identifier information relating to the second communications cell from the mobile terminal; and
- H defining a handover candidate cell list for the mobile terminal, the handover candidate cell list including the second communications cell.

The witnesses

19. Unwired Planet called Dr Jonathan Moss as an expert. Dr Moss is a telecommunications engineer. He has a Masters in Engineering Science and a D.Phil. in mobile telecommunications, both from the University of Oxford and is a member of the IEEE. Between 1998 and 2003, he worked as a 3G network optimiser for a number of telecoms companies, including O2 UK and O2 Ireland. Dr Moss subsequently worked for i-mate Dubai, managing a team of engineers in Europe and Dubai concerned with designing mobile phone handsets. More recently, Dr Moss has worked as a consultant, providing training courses in relation to various aspects of mobile telecoms. He is also involved with delivering telecoms training at the University of Oxford. There was a suggestion that Dr Moss was not well qualified to give evidence in this case. I do not agree. He clearly understood and was able to explain the technical issues and was doing so from the perspective of an expert in this field. He had not attended any of the particular standardisation meetings relevant to this case but neither had Prof Saunders (see below).
20. Huawei called Professor Simon Saunders as an expert. Prof Saunders has a BSc in Electrical and Electronic Engineering and a PhD from Brunel University. From 1996 to 2006, he was Chief Technology Officer first at Cellular Design Services Ltd and, following a merger, Red-M Group Ltd and was responsible for research and development of products and services for the design and implementation of current and future wireless networks. Prof Saunders was a member of the Ofcom Spectrum Advisory Board between 2007 and 2014. He was also the Founding Chairman of the Small Cell Forum, which was a forum for mobile operators and equipment vendors looking to develop small cells for UMTS and LTE. Since 2007 he has acted as an independent expert and consultant in the field of wireless telecommunications and a member of the Ofcom Spectrum Advisory Board. He is currently an adjunct assistant professor in communications systems at Trinity College Dublin. Prof Saunders was a knowledgeable witness. He did not attend the relevant standardisation meetings either (see Dr Moss above). Both men were in as good a position as the other to help the court on the technical issues in this case.
21. Each side criticised the other's expert. The defendants criticised the manner in which Dr Moss gave his answers (reluctant to answer pertinent questions, gave poor reasons for his answers, was concerned to make a different point rather than answer the question, and was prepared to speculate). I did not detect any of this in Dr Moss' testimony and I reject that. Samsung's counsel chastised Dr Moss in cross-examination for failing to mention a particular draft standard document TS 36.600 version 0.5.0 in his first report. There was nothing in the criticism. Samsung's expert had not mentioned it in his first report either (the point relating to the document, which involved an issue about the track changes aspects of it, struck me as unmeritorious in any case).
22. Unwired Planet criticised Prof Saunders. The first point related to views expressed about common general knowledge on two issues, one about whether certain tools were or were not fully automated, which had a bearing on an abandoned piece of prior art (Jansson), and the other about whether phones would have neighbour cell lists. I did not detect anything untoward in the Professor's answers about the automation point. On the issue of neighbour cell lists, the substantive point is addressed in more detail below. Again however I can find no basis for criticising Prof Saunders here. The second point was a counterpart of the point put to Dr Moss about TS 36.300

v0.5.0 and track changes. There was no reason to criticise the Professor about this. At most the point illustrated why the defendants' criticism of Dr Moss was unwarranted. The third point was a submission that Prof Saunders' views were influenced by hindsight. I will address hindsight in context below. The fourth point was a submission that Prof Saunders made fundamental errors. This arose in the context of an argument which had been dropped by the defendants before trial, that the claims were anticipated by certain 3G standards. I did not have to consider the argument in any depth but from what I did have to consider, it was pretty convoluted. A question asked in cross-examination led to the Professor giving an answer which related back to that issue, about 3G phone states and cell IDs reporting in 3G. The next day Prof Saunders sought to correct something he had said before. I am not surprised. It was an indication that the Professor was seeking to assist. It does not indicate that his answers were a ground for criticism. I am not at all surprised that Prof Saunders had misremembered aspects of this anticipation point.

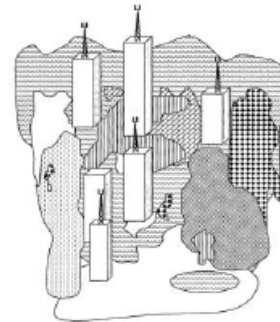
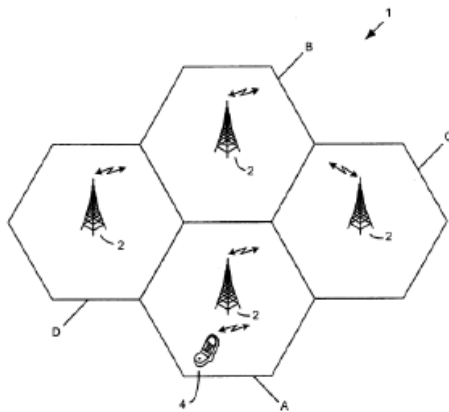
23. Overall in my judgment both Dr Moss and Prof Saunders gave their evidence entirely fairly.
24. Samsung served two expert's reports from Professor Thomas Kürner. In a perfect world it would have been better if it had been possible for Huawei and Samsung to serve expert's reports from a single individual and in the summer the deadline for service of the first expert's reports from those parties had been set, taking into account the possibility that they might be able to do so. However that did not happen. Given the differences which then existed between the cases advanced by Huawei and Samsung, that approach was probably inevitable. However, as events unfolded the issues narrowed in the period up to the trial and the cases advanced by Huawei and Samsung aligned so that once Prof Saunders had been cross-examined, the two parties' cases were identical. If Prof Kürner had been called his evidence would have covered the same ground as the evidence given by Prof Saunders and would have been in support of an identical case.
25. After a number of case management discussions during the course of the trial Samsung took the decision that they would not call Prof Kürner and would instead rely on the evidence of Prof Saunders in support of their case. This was a pragmatic and sensible decision. For many years the Patents Court has sought to manage the cases in its list to ensure that duplicative expert evidence in support of the same case is not called. It is obviously undesirable, needlessly costly and can be very unfair to the other party. In retrospect I think it might have been better if a pre-trial review had been conducted some weeks before trial since that might have triggered the narrowing of the issues which ultimately led to there being no need for two experts on the defendants' side, but that is hindsight.
26. Since Professor Kürner's reports had been put to Dr Moss and Prof Saunders, it was common ground that the Professor Kürner's reports and exhibits should remain as part of the materials in the case to which the parties could refer. A point arose on certain documents about a project called SOCRATES which the professor had worked on. Unwired Planet submitted that they showed that a group working on the problem missed the invention but I am not satisfied that is a safe inference to draw from the documents alone.

The skilled person/team

27. There was no real dispute between the parties as to the identity of the skilled team. Although Dr Moss and Prof Saunders did not describe the skilled team in precisely the same terms, it is common ground that the patents are addressed to a team of wireless telecommunications engineers comprising a radio planner, network optimiser and standardisation engineer. The latter is particularly important, as the invention requires implementation in a standard that supports the relevant messaging required for the phone to be able to detect and report the unique identifier. The skilled team would clearly be interested in the configuration and optimisation of telecoms networks.
28. A point which arose in cross-examination of Dr Moss was whether or not it should be assumed that the skilled standards engineer attended every standards meeting of the two committees (Working Groups 2 and 3). Although the person skilled in the art is a legal construct, he or she is supposed to reflect reality (See *Teva v Leo* [2015] EWCA 779 (Civ)). I am sure real engineers attended very many meetings but there is no evidence in this case that any single individual engineer attended every meeting of both WG2 and WG3. I find as a fact that the standards engineer member of the skilled team would not have attended every meeting of both WG2 and WG3.
29. Absent very strong evidence, the law will not require the relevant member of the skilled team concerned with standardisation to be taken as having attended every standards meeting and to have read and retained every proposal discussed at those meetings. That would be entirely unrealistic. No real person would do anything like that. While standardisation engineers would no doubt aim to attend all the meetings for their group and would aim to read all the relevant proposals for that group, it would be unrealistic go further than this. Even if real engineers did attend every meeting that does not mean that every proposal and every discussion at every meeting is necessarily part of the common general knowledge.

The common general knowledge

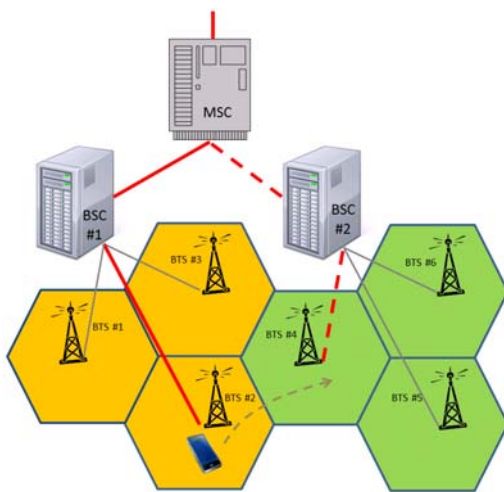
30. Arnold J summarised the law on common general knowledge in *KCI Licensing v Smith & Nephew* [2010] EWHC 1487 (Pat) at paragraph 105-115. This summary was approved by the Court of Appeal ([2010] EWCA Civ 1260, see paragraph 6).
31. The left hand diagram below shows a simplified hexagonal arrangement of cells in a telecommunications network. Real systems are more complicated. This is nicely illustrated by the diagram on the right in which different cells are represented by shading:



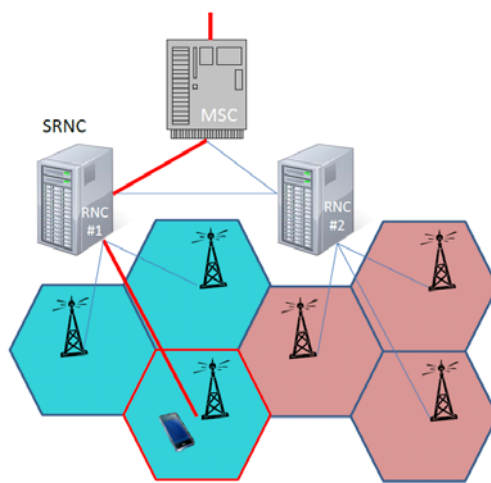
32. The coverage area of a cell is influenced by factors including the location of the base site, the orientation of its antenna, environmental obstructions (such as buildings), radio interference, and transmission frequency. The goals of a network operator include avoiding blackspots in network coverage while minimising rollout costs, and supporting as many users as possible in a given area.
33. In a mobile network, it is necessary for each cell in the network to know its neighbouring cells, so that a phone with an active connection to that cell (called the serving cell) can be transferred to a neighbouring cell if it would be better served by that cell (typically because signal strength or quality is better). This is handover. The goal is to ensure call/data continuity despite, say, movement between cells. A related but different process is cell reselection in which a phone searches for and “listens” to a neighbouring cell.
34. The patents are not specific to a particular type of mobile network. The main types are GSM (2G), UMTS (3G), and LTE (4G). GSM stood for “Groupe Spécial Mobile” but now means “Global System for Mobile communications”. UMTS stands for Universal Mobile Telecommunications System and LTE stands for Long Term Evolution. GSM is a TDMA (time division multiple access) system, UMTS is a WCDMA (wide band code division multiple access) system and LTE uses further different access techniques (OFDMA – orthogonal frequency division multiple access, and SC-FDMA – single carrier frequency division multiple access). Nevertheless the core networks in all three types of network perform the same essential tasks of routing calls and data between cells and connecting to other networks, such as the internet. The core networks include an Operations and Maintenance Centre (“O&M” or “OMC”) which manages the network and controls cell configuration at least to some extent. The Radio Access Network (“RAN”) links mobiles to the network over the air via a base station. Today in GSM the RAN is called GERAN (GSM EDGE Radio Access Network, in which EDGE stands for Enhanced Data rates for GSM Evolution). In UMTS the RAN is called UTRAN (Universal Terrestrial Radio Access Network). In LTE the RAN is called E-UTRAN, for Evolved-UTRAN. This paragraph illustrates a commonplace problem with explaining anything about mobile telecommunications, that alphabet soup is unavoidable.

35. The structure of the core networks in GSM and UMTS are related in that there is a central element (the Mobile Switching Centre (“MSC”)), then there are intermediate units called Base Station Controllers (“BSCs”) in GSM and Radio Network Controllers (“RNCs”) in UMTS, and then there are base stations in the individual cells. The base station in GSM is called a Base Transceiver Station (“BTS”) and in UMTS it is called a Node B. In fact the GPRS and EDGE aspects of GSM complicate the picture for GSM but that does not matter. Pictorial representations of the GSM and UMTS core networks are set out below. The base stations are depicted as antennae, one in each cell. These images are taken from my judgment in *Vringo v ZTE* ([2014] EWHC 3924 (Pat)). They provide convenient representations of the relevant networks although the diagrams include some irrelevant details which mattered in *Vringo* but do not matter here.

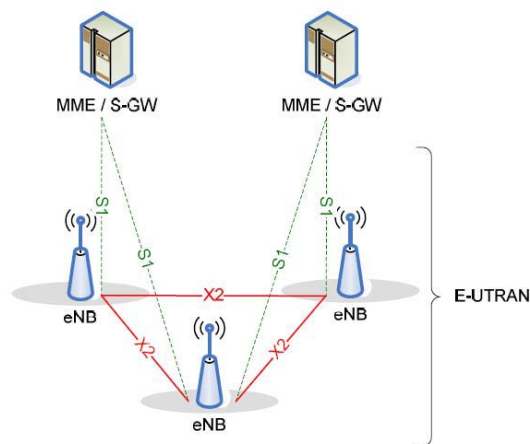
A GSM core network



A UMTS core network



36. The core network in LTE is different. There are only two kinds of elements instead of three. The network elements are an MME /S-GW and a base station. The term MME / S-GW stands for Mobile Management Entity / Serving Gateway. There are other kinds of gateways but these details do not matter. In other words, as compared to UMTS, in LTE the element which was the RNC in UMTS has been abolished. In LTE the base station is called an “evolved Node B” or eNode B. A depiction (again from *Vringo*) of the LTE core network is:



37. A point of significance is that the eNode Bs in LTE can have direct connections to one another (see the lines marked X2 in the diagram) as well as connections to the MME/S-GWs. All these connections in the LTE core network are over an IP network.
38. The idea of unique and non-unique identifiers for cells was mentioned in the introduction section. The particular identifiers in GSM and UMTS are:
 - i) In GSM the identifiers are the Base Station Identity Code (“BSIC”) and Broadcast Control Channel (“BCCH”) channel number. There are a variable number of BCCH channels (typically 18), and up to 8 BSIC values for a given network operator, giving 144 (8x18) identifiers in total. There may have been a point of detail about whether more identifiers were available in GSM but it does not matter. The combination of BSIC and BCCH does not uniquely identify a cell in the network. There was also a unique ID provided in the GSM standard.
 - ii) The identifiers in UMTS are the Primary Scrambling Code (“PSC”) and Cell Global Identity (“CGI”) (also called the cell identity). The PSC is a physical cell identifier or PCI. There are 512 PSCs and the PSC does not uniquely identify a cell in the network. The CGI is a 28 bit number and is a unique identifier.
39. To allow for handover and for other reasons, the phones in GSM and UMTS measure parameters such as signal strength and quality for the neighbouring cells that they can detect. The parameters reported are standardised and can be configured by the network. The results of those measurements are reported back to the serving cell in a message called a measurement report. This may happen periodically or on the occurrence of a predefined condition.
40. For present purposes there are two sorts of reporting in UMTS: monitored set reporting and detected set reporting. The “monitored set” is the set of cells on the phone’s neighbour cell list. In monitored set reporting the phone makes measurements for all the cells in the monitored set, i.e. all the cells on its list. These reports are made relatively frequently and are used to facilitate handover. The “detected set” consists of cells which a phone can detect (with a signal above a given threshold) which are not in the monitored set. A phone can be instructed to undertake detected set reporting. It is not necessary to do this as frequently as monitored set reporting and generally phones are instructed to do this less often. Detected set reporting will find neighbours (with sufficient strength) which are not on the neighbour cell list. These could be completely new cells as well as cells which have become prominent perhaps as a result of a change in the local environment. In UMTS both monitored set reports and detected set reports are provided based on the PCI of the cell. In UMTS the data from the measurement reports was passed up to the RNCs by the NodeBs and then on to the central OMC system for use with network monitoring, maintenance and optimisation.
41. In UMTS a phone could be in either Idle Mode or Connected Mode. Within Connected Mode it could be in one of four states, two of which were Cell_DCH and Cell_FACH. In effect Idle Mode is the state a phone is in when it is switched on but not doing anything else. The phone needs to be associated with a cell so that, for

example, it can ring when an incoming call to the phone is made. Then the phone goes into Connected Mode, specifically Cell_DCH state, for the actual call. In this state the phone has an active connection to the network. Cell_DCH state also applies if the phone has a heavy data connection, e.g. streaming video from the internet. In Cell_FACH the phone is still in Connected Mode but only small amounts of data are capable of being transferred as there is no dedicated channel assigned to the phone. One of the simplifications in LTE was the proposal to have only two states – Idle and Connected, and no sub-states.

42. If a phone in Idle Mode moved to a new cell, the process was called cell reselection. If a phone moved to a new cell in Connected Mode that is called handover. The two processes differ because the nature of the states themselves differ. In UMTS in Connected Mode a phone could have an active data connection with more than one cell. This is called soft handover and the set of cells with which a phone maintains an active connection in this way is called the active set. Another of the simplifications in LTE was the proposal to have no soft handover and so no active set.
43. LTE was under development at the priority date. Much of the basic structure of how LTE would work had been agreed, including the aspects described as common general knowledge above. Nevertheless there was still a very large amount of work to do. It was common general knowledge at the priority date that in LTE a cell would have a physical identifier. It would be the synchronisation code. It is referred to as the PCI. There would be 504 PCIs and so it is not a unique identifier. It was common general knowledge that there would be a unique ID code which would identify the cell uniquely across all networks. Today that number is called E-UTRAN Cell Global Identifier (“ECGI”). It is a 52 bit number composed of the “CellIdentity” (28 bits, which identifies the cell) and “PLMN Id” (24 bits, which identifies the network). These latter details were only defined after the Priority Date.

Common general knowledge - SON

44. This case relates to the idea of having a self-configuring or self-optimising network. The latter is called SON although the term SON is often applied to the general concept without distinguishing between configuration and optimisation. In order to explain what this is about one needs to step back and consider radio network planning and optimisation in general. This is the process by which operators select base station sites and adjust their base station characteristics over time, to provide and maintain an appropriate level of coverage, capacity and service quality. The process was described by the experts in their reports. The aim of the process is to ensure that each base station in the network delivers an adequate level of performance; and to integrate newly installed base stations into the network. This usually involves both setting the initial parameters and adjusting the parameters of the surrounding base stations to accommodate it.
45. Until the end of the 1990s planning GSM networks was typically done manually or with the assistance of software based radio network planning tools. In particular it was necessary to plan the correct allocation of GSM frequencies and BSIC codes to the base stations. One method of investigating interference and other problem areas was drive testing, in which special phones and other specialist test equipment is sent to particular locations to report on the signal strength and interference levels from

cells in the surrounding area. Data from drive testing was used in the optimisation process.

46. In December 1999, the first release of the UMTS standard was frozen. When UMTS was introduced, it was expected that network planning would be easier than GSM but in practice it became harder. The details why this occurred do not matter.
47. An issue between the parties was the state of the common general knowledge relating to SON at the priority date. Unwired Planet made the point that SON was not new at the priority date and that the use by UMTS network operators of software tools to plan, maintain and optimise their networks was well established at the priority date. I agree with both points. There was a dispute about the extent to which automated tools were used without manual intervention but I will address that in context.
48. By the priority date, it was part of the common general knowledge of the skilled team that network operators wanted the LTE standard itself to specify some SON features. I do not think, stated at this general level, there was any dispute about this but if there was, Prof Saunders gave clear evidence on the point and I accept it. The draft standard document setting out the overall description of the EUTRAN, designated 3GPP TS 36.300 V0.5.0, which was published close to the priority date, includes a brief discussion about support for self-organisation and self-optimisation in section 22.
49. An important point is that what the network operators were understood to want was for a degree of standardisation to be introduced. One problem they were concerned with was that this sort of thing was not standardised in the UMTS standards at all and so there were a variety of different tools and approaches to network maintenance and optimisation in existence which were not necessarily interoperable.
50. What was not part of the common general knowledge however was any real detail about any of these matters. SON covers a wide variety of different things and little was known about what would or might be incorporated into the LTE standards. The text in the draft standard TS 36.300 is general in nature. What was known was that the operators wanted some sort of SON features. The skilled team knew it was wanted and understood why. That is not the same as saying that the operators would be successful in their objectives in having any particular expedient included in the standards.
51. As part of the attack based on common general knowledge alone the defendants referred to a document called the NGMN White Paper. The paper is dated 5th December 2006 and is entitled “A White Paper by the NGMN Alliance: Next Generation Mobile Networks: Beyond HSPA and EVDO”. NGMN stands for next generation mobile networks. The NGMN Alliance was a lobby group of leading network operators seeking to influence the development of the next generation of mobile standards after UMTS. The operators included T Mobile, Vodafone, Orange and NTT DoCoMo.
52. The evidence does not establish that the NGMN White Paper as a document was common general knowledge. I will not spend long on this. Prof Saunders had not read it at the time. He did know of the NGMN Alliance itself but that makes no difference. There is no suggestion that the NGMN White Paper is in that sometimes

tricky class of documents which a skilled team did not know but might look up. It was simply not common general knowledge.

53. Moreover I reject any suggestion that its entire contents represented the common general knowledge even if the document itself was not. It is 71 pages long and full of technical material and proposals. There is no evidence all that was common general knowledge. It contains a few general statements consistent with the findings above on common general knowledge but that is all.

Common general knowledge – neighbour cell lists

54. The defendants submitted that by the priority date it was common general knowledge that there was a debate about whether neighbour cell lists would be provided to phones and that the skilled team would know that they could not proceed on the assumption that a phone would be provided with a neighbour cell list. This was based on three proposal documents produced by Ericsson to WG2. They are TDoc R2-063305 for the November 2006 meeting in Riga, TDoc R2-070042 for the January 2007 meeting in Sorrento, and TDoc R-070561 for the 12-16 February 2007 meeting in St Louis, Missouri. The second document is misdated.
55. Prof Saunders' first report does not mention this point. It was based on the assumption that there would be neighbour cell lists in phones in LTE. In his second report Prof Saunders refers to the three Ericsson documents which he had been provided with by the legal team. He expressed the view in his second report that the skilled person would understand that whether the phone would be given a neighbour cell list was under discussion. In his third report Dr Moss had stated, in reply to this evidence that the skilled team would have been aware of the discussions.
56. As Unwired Planet pointed out, the three Ericsson documents are a sub-set of the discussions, as Prof Saunders accepted, and only reflect the views of those who did want to remove the neighbour cell list. Also as Unwired Planet pointed out, the draft standards documents which were current at the time included numerous sections which required neighbour cell lists in the phone. A point arose on the track changes in TS 36.300 v0.5.0 but those changes do not support the defendants' case. Also, as Unwired Planet noted, looking at the documents themselves, they raise the idea of thinking about whether to have a neighbour cell list in the phone (as opposed to in the eNode B) but no more than that. One of the ideas is to keep neighbour cell lists to assist with cell search optimisation in Idle Mode.
57. In their written closing the defendants submitted (paragraph 62) that Dr Moss was clear in cross-examination that the skilled team could not (defendants' emphasis) proceed upon the assumption that neighbour cell lists would be provided to phones. That is not correct. On the contrary that proposition was put to Dr Moss in cross-examination but he did not accept it. He did not dispute that the debate existed but he did not agree with the stronger way of putting it advanced by the defendants. That was how I understood his evidence at trial and I carefully re-read the whole passage of cross-examination in the transcript with this in mind from T2/219-238 (and beyond).
58. I find that the most that can be said is that the skilled team would have been aware that a proposal to consider neighbour cell lists in phones had been made and would

have been aware of a debate on the issue which was underway and was not finished. I find that the skilled team did not think neighbour cell lists in phones had been abolished nor did they think a requirement for such lists was likely to be abolished.

59. There are other aspects of the common general knowledge which have a bearing on the issues in this case. They are dealt with in context below.

The patents

60. The specifications of the 287 and 514 patents are almost identical, save for a few very minor differences. I will focus on the 287 specification.
61. The invention is described at [0001] as relating to self- configuring and optimisation of cell neighbours in wireless telecommunications networks. In the background section, paragraphs [0002]-[0003] refer to figure 1. This defines a number of communication cells served by a radio base station and depicts a mobile terminal communicating in a cell with an ability to move around the system. In the patent the phone is called a mobile terminal. Paragraph [0003] states that a base station contains a number of receivers and transmitters to give radio coverage for one or more cells and describes how each base station is connected to a core network infrastructure which enables communications between base stations and other networks.
62. Paragraph [0004] explains that, as a mobile terminal typically moves around amongst the network's cells, a list of known neighbours, or a "neighbour cell set" is important for both the network and the mobile terminal to ensure reliable handover between cells. Information relating to neighbour sets for each mobile terminal can be stored in the network and used for evaluation and handover of a mobile terminal from one cell to another as it crosses a cell boundary.
63. Paragraph [0005] describes the "operating parameters" of the cell, which is the information that the mobile measures and reports back to the network. The information transferred includes information relating to signal strength, signal quality and timing information. This paragraph [0005] further states that, where the quality of a neighbouring cell is considered to be better than the current serving cell, the network executes a handover.
64. Paragraph [0006] explains that typically in WCDMA systems the mobile terminal detects Common Pilot Channel (CPICH) transmissions from surrounding cells in order to determine their identity and timing information. The identity referred to is the scrambling code for the cell. Paragraph [0007] emphasises that the identity of the cells becomes important when the mobile reports the neighbour cell signal quality measurements to the network. This also states that, currently, cell identities (scrambling codes) are reused for more than one cell, which can lead to a risk of confusion between cells.
65. Paragraphs [0008]-[0009] refer to a prior art proposal (WO 96/38014) which relates to GSM. The prior art proposal refers to a "unique" cell identity but the 287 patent contends that what is referred to is the GSM BSIC (see above) which is non-unique across the network.

66. Paragraph [0010] identifies the problems with using only non-unique identifiers, namely that the process of populating and maintaining the neighbour cell sets can never be fully automatic and that the careful planning required to prevent cells being mistaken as other cells can be “cumbersome.”
67. The summary of the present invention begins at paragraph [0011]. This states that the invention aims to reduce the cost of planning and maintaining neighbour cell sets. The invention is said to be based on “an extra step” that is made where mobile terminals are required to make an additional effort to identify uniquely neighbouring cells in the radio network and that the identities are reported from the mobile terminal to the network. This paragraph states that the invention could be implemented in GSM, UMTS or LTE.
68. Paragraphs [0012]-[0015] describe embodiments of the invention. They are drafted from the perspective of a method for a mobile terminal (paragraph [0012]), a mobile terminal as a product (paragraph [0013]), a method in a telecommunications system as a whole (paragraph [0014]), and a network as a product (paragraph [0015]). In relation to the live issues, these different ways of characterising the invention only matter for the clarity objection.
69. Paragraph [0016] includes a brief description of the drawings. The detailed description section begins at paragraph [0017]. Paragraphs [0021]-[0022] provide a detailed description of the method by reference to the flowcharts in figures 3-6. First the mobile terminal determines parameter measurements for the surrounding cells. The mobile terminal then reports this measurement information to the base station. The base station receives this information, which is tied to the cell’s non-unique identifier. If that non-unique identifier is not listed in the base station’s neighbour cell set, the base station can instruct the mobile terminal to retrieve the cell’s unique identity. The figures refer to this as the “monitor instruction”. The unique cell identity is broadcast from the base station at a much less frequent interval than the physical layer identity (i.e. the non-unique identity) and the mobile terminal may need to momentarily interrupt its communication with the serving cell in order to receive and decode this information. The unique cell identity is retrieved by the mobile terminal and transmits this information to the base station. The base station subsequently adds the newly discovered neighbour cell to its neighbour cell set. It can now establish a transport connection to that cell.
70. Some of the benefits of the invention are described beginning at paragraph [0025]. The use of unique identifiers means that confusion regarding ambiguous cells is removed, but the process of using non-unique identifiers for most of the measurements facilitates efficient resource usage as the mobile terminal is only requested to retrieve the more cumbersome unique cell identifier when a new neighbour is detected. The major advantage of the invention is stated at paragraph [0027] as being the fact that the invention removes the need for manual involvement within the process of maintaining neighbour cell sets.

Claim construction

71. Lord Hoffmann summarised the law on claim construction in *Kirin-Amgen* [2005] R.P.C. 9. He stated at paragraph 32 that construction of patent claims “is concerned with what a reasonable person to whom the utterance was addressed would have

understood the author to be using the words to mean.” Sir Robin Jacob summarised the effects of the judgment in *Kirin-Amgen* and the principles to be applied in *Virgin Atlantic Airways v. Premium Aircraft Interiors* [2010] R.P.C. at paragraph 5.

72. There were no disputes about claim construction other than points on added matter and clarity which are addressed separately below. I will mention some points which I believe were not controversial:
73. The claims refer to non-unique identifier information or a non-unique cell identity. They mean the same thing. The non-unique identifier is an identifier (obviously) but it is one which is not unique in the network. The paradigm example will be that it is not unique because it is reused across the network. An example is a PCI.
74. The claims refer to unique identifier information or a unique cell identity. These identifiers uniquely identify the cell in the network as a whole. The claims also refer to “detecting” the identifiers or “retrieving” them. These are general words and would not be understood to require any particular way of doing it. The point is that the phone has to acquire the relevant information.
75. The claims refer to a neighbour cell list or neighbour cell set. They mean the same thing. Claim 12 of 287 refers to a step in a method for controlling resources in a network of defining a neighbour cell list “for the mobile terminal”. In general the reader would understand that the patent is concerned with a neighbour cell list held by the network. A list may be “for” a phone in the sense that it is suitable for use by a phone. That would be the sort of thing one might do when using the neighbour cell list to produce a list of handover candidates (see feature (h) of claim 12). That is all this wording means.
76. There was a debate about the order of steps in certain method claims but once the issues narrowed it did not matter and I prefer not to grapple with it.

Obviousness

77. A patented invention must involve an inventive step, which means that it must not be obvious to a skilled person having regard to the state of the art (s1(1)(b) and s3 of the 1977 Act, Art 56 EPC). The structured approach to assessing obviousness was set out by the Court of Appeal in *Pozzoli v BDMO* [2007] EWCA Civ 588.
78. The following statement of Kitchin J in *Generics v Lundbeck* [2007] RPC 32 was approved by Lord Hoffmann (with whom the others of their Lordships agreed) in *Conor v Angiotech* [2008] UKHL 49, [2008] RPC 28:

“The question of obviousness must be considered on the facts of each case. The court must consider the weight to be attached to any particular factor in the light of all the relevant circumstances. These may include such matters as the motive to find a solution to the problem the patent addresses, the number and extent of the possible avenues of research, the effort involved in pursuing them and the expectation of success.”

79. In *Medimmune v Novartis* [2012] EWCA Civ 1234 the Court of Appeal, Kitchin LJ said at paragraph 93 that the court's task was ultimately “to evaluate all the relevant circumstances in order to answer a single and relatively simple question of fact”; see also Lewison LJ paragraphs 117 — 186.
80. Both obviousness arguments arise from the same context. In the period up to the priority date the LTE standard was under development. The relevant committees working on the relevant issues were TSG-RAN Working Groups 2 and 3. The committees met every few months. The working papers at the time include both draft standards and documents making proposals on issues. There are documents called Technical Reports and have the designation TR. These are in effect the earliest draft standards. Later a draft standard proper is prepared and this is called a Technical Specification or TS. In addition to the draft standards documents themselves, numerous other papers were sent in to the committees by different participants in the standard setting process.

The Qualcomm document

81. The Qualcomm document is entitled “Discovery of neighbour cells in E-UTRAN”. The introduction section starts by explaining that at the previous meeting of the working group, there was a discussion of the concept of “plug and play” eNode Bs.
82. The term “plug and play” is a reference to an idea from personal computers concerning new peripheral devices like printers. In the past when a new peripheral device was to be connected to a computer, the user had to manually set everything up and run the necessary software to configure the system so that the new device could be used. A plug and play device was one which (at least in theory) could be simply be plugged into a computer when it was new and, after a period of automatic self-configuration, would be ready to use (i.e. “play”) without any manual intervention from the user.
83. At this stage the Qualcomm document cross-refers to reference [1]. This is a discussion document R2-061545 from T-Mobile and KPN (“the T-Mobile document”) which had been presented to the previous meeting in Shanghai on 8th-12th May 2006. It is convenient to turn to that T-Mobile document at this stage.
84. In its Introduction section, the T-Mobile document refers to the problem that network operators face an ongoing need to setup and maintain a network over the lifetime of the system and makes the point that significant efforts are needed for network planning and optimisation. It points out that the UMTS system lacks support of automatic tools and procedures to install, setup and configure NodeBs with minimum operational efforts. The document also draws a distinction between the GSM and UMTS networks (i.e. between GERAN and UTRAN respectively). A higher number of options and parameters has to be maintained in UTRAN than in GERAN. Initial deployment of UTRAN lacked performance and deployment of UTRAN networks was and will be costly.
85. Section 3 of the T-Mobile document proposes that LTE should support automatic installation of newly deployed eNode Bs in a “plug and play” manner. The T-Mobile document refers to eNode Bs being capable of evaluating their own neighbourhood with regards to the automatic creation of neighbour cell lists. Radio measurements

are referred to together with the idea of obtaining necessary neighbour lists via the E-UTRAN network itself from neighbour eNode Bs, servers or other network entities. The T-Mobile document refers to “UE assisted neighbour cell definition and network optimisation” which includes the ability of phones to report measurements needed for normal operation and measurements specifically configured for maintenance. The final paragraph proposes that the LTE standard needs to require, from the outset, that phones have the capacity to undertake the necessary measurements and needs to include the relevant signalling procedures. Further detailed aspects are referred to as “FFS” which means “for further study”.

86. The T-Mobile document proposes text for the draft standard (TR 25.912) which is set out in paragraph 12.1. The text refers to minimising overall system complexity, to supporting self-configuration of newly deployed eNode Bs in a “plug and play” manner, and to efficient optimisation.

87. Turning back to the Qualcomm document itself, after the reference to the T-Mobile document, the Introduction section states that the aim is to minimise operational efforts for setting up the E-UTRAN system and provides:

“There seem to be two elements in the concept of ‘plug-and-play eNode B.

- Discovery of other nodes

- Self-configuration of operational parameters by an eNode B

The second part includes the configuration of the neighbour list maintained by an eNode B. In [1] it is stated that the neighbour list can be constructed over time through radio measurements performed by UEs.”

88. The Qualcomm document then refers to a second document, reference [2]. It is Technical Report TR25.814 V7.0.0, which relates to the proposed physical layer aspects of the LTE system (“E-UTRA”).

89. The cross-reference to TR25.814 V7.0.0 is as follows:

“RANI TR [2] suggests that a UE would only know cell IDs of non-serving cells through measurements. An identified cell ID is reported from the UE to the serving eNode B with a measurement report.

Here the serving eNode B may not know the IP address of the eNode B employing the identified cell. There must be a way for an eNode B to know the contact point (IP address) of the target eNode B identified with a cell ID reported by the UE.”

90. The point being made by the Qualcomm document here is that the phones will send measurement reports of non-serving cells to the eNode B. Necessarily the report will have to identify the cell reported on. The document refers to a “cell ID”, which I find the reader would understand meant a non-unique identifier such as the PCI. The

passage also states that phones will only know cell IDs of non-serving cells through measurements.

91. As the Qualcomm document states, the serving eNode B needs the IP address of the eNode B employing the identified cell. It may not know that IP address and so there needs to be a way to find out. The reader would understand this was in order to be able to create a transport link to the eNode B.
92. Section 2.1 of the Qualcomm document is as follows:

“UE Measurement

If an eNode B would like to establish an association to another eNode B, the source eNode B needs to know the IP address of the target eNode B. It is expected that the UE cannot know the IP address of an eNode B that is found through radio measurement. However it is sensible to assume that the identification of the unique identity of a measured cell would be possible [2]. As example, in UMTS the "PLMN Identity" (5-6 digits) and the "Cell Identity" (28 bits) together provide a globally unique identifier of the cell.

After receiving a measurement report from the UE the serving eNode B needs to identify the IP address of the eNode B that the measured cell is belonging to.

The following section proposes a mechanism to achieve this requirement.”

93. Here the Qualcomm document is making the point that the IP address of the target eNode B will not be broadcast and so is not something the phone could derive by “radio measurement”. In this context “measurement” does not just mean measuring parameters like signal strength but includes decoding and interpreting the radio signals from a cell, at least to some extent. However each eNode B has a globally unique identifier code which “it is sensible to assume” could be obtained by the phone by measurement and could be used by the source eNode B to derive the IP address of the target eNode B. In this passage the text refers to reference [2] but that is an error. By the relevant time it was clear that eNode Bs in LTE would have globally unique identifiers and that would have been common general knowledge, but that is not stated in reference [2].
94. In section 3 the Qualcomm document produces a scheme in a diagram at Figure 1, which is introduced as follows:

“Targeted discovery with cell ID

The scheme below can be used when the eNode B knows a node that may have information for the target eNode B. This is the typical situation for a working eNode B, since it must have some connection to a GW [*gateway*] already. One example is a network where the operator deploys servers that have a mapping database for cell IDs and IP addresses of eNode Bs, a function similar to what is provided by

DNS servers. The actual location of this server functionality is for further study.”

95. The idea is that the scheme can be used when the network includes a node, such as a server, which maintains a mapping database relating the unique cell identifiers to IP addresses. An analogy is drawn with DNS servers which perform a similar function on the internet. As long as the source eNode B knows which node to ask for information about the target eNode B, the source eNode B can ask that node for the IP address by providing the unique cell identifier to it.
96. Figure 1 of the Qualcomm document is:

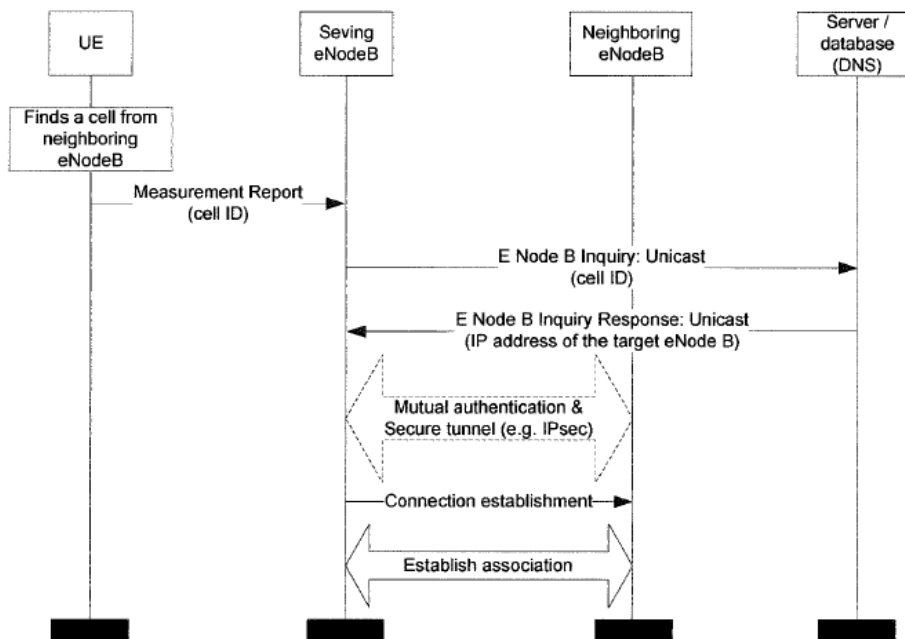


Figure-1: Targeted discovery with cell ID

97. Diagrams of this kind are common in telecommunications standards. In this diagram four nodes are represented, a UE (e.g. a phone), a serving eNode B (referred to in the text as the source eNode B), a neighbour eNode B (referred to in the text as the target eNode B), and a server/database DNS. Steps undertaken by the nodes and messages passing between them are shown in the diagram. The sequence of steps is represented by moving downwards.
98. The first step in the scheme is represented by the box “Finds a cell from neighbouring eNode B” at the top left. One reason the language refers to “a cell from an eNode B” rather than just to finding an eNode B is because strictly an eNode B can have multiple cells. For present purposes it is safe to work on the basis that one eNode B has one cell.
99. One of the debates at trial was about what this first box would represent to the skilled person. The arguments about the word “finds” and so on are best dealt with in the context below. As a matter of disclosure, the first box does not bear much elaboration. It simply refers to the phone finding a cell/eNode B. The cell which is found is the neighbour eNode B in the diagram.

100. The next step in the diagram is that the phone sends a measurement report to its serving eNode B. The diagram indicates that this report will include a “cell ID”. In context the reader would understand this to refer to the unique cell ID.
101. Next the serving eNode B sends a message to the server/database DNS asking for the IP address of the neighbour eNode B. The server/database then responds with the IP address and the final lines in the figure relate to the serving eNode B and neighbour eNode B setting up a connection. In LTE this connection is the X2 interface.
102. The reader would understand that the process of asking for an IP address is only necessary if the serving eNode B did not know the IP address for the neighbour eNode B. That is self evident. One way of thinking about the issues in this case is to ask whether the reader of the Qualcomm document would understand the diagram to mean that the serving eNode B was to decide whether to ask for the IP address of the neighbour eNode B after receiving the measurement report shown, or whether all the steps in the diagram take place in a context in which the serving eNode B has realised it needs the IP address for a neighbour eNode B and the diagram shows how to get it, or because the phone has identified a new eNode B based on comparing the PCI with its own neighbour list and decided to tell the eNode B about it for that reason. In my judgment, as a matter of disclosure the document as a whole, including the diagram, is unspecific. It does not purport to specify any of these options. What this debate does illustrate is that, as the skilled person would understand, the Qualcomm document is written at a high level of generality. It does not attempt to explore all the details and does not purport to set out all the detailed steps which may be required.
103. The final part of the Qualcomm document is section 4, titled conclusion, which states:

“We discussed a mechanism that would be needed to achieve self-configuration of the neighbour list in LTE network where the concept of the plug-n-play eNode B is used.”
104. This does not add anything to the rest of the document.
105. The skilled person and the common general knowledge have been identified above. The inventive concept is clear from the claim, properly construed. The difference between the claims and the Qualcomm document can be explained as follows. The Qualcomm document proposes that in the context of discovery of neighbours and self-configuration, the phone should be used to find out the unique identifier for a target cell/eNode B and send that to the serving eNode B. The eNode B can use that unique identifier to obtain the IP address for the target cell/eNode B from a server or database elsewhere in the network. What does not appear in Qualcomm is any reference to the phone sending the eNode B a non-unique identifier for neighbouring cells and any reference to a step (such as features E and F in claim 12 of 287) whereby the serving eNode B determines from the non-unique identifier that it wants or needs to obtain a unique identifier and instructs the phone to get it.
106. In terms of claim features, the Qualcomm document discloses the following features of claim 12: feature A (controlling resources in a network), feature B (communicating with a mobile in a first cell), feature D (defining a neighbour list), feature G (receiving a unique identifier of the second cell from the mobile) and feature H

(defining a handover candidate cell list including the second cell). Features C, E and F are absent.

107. Samsung and Huawei submitted the invention was obvious over Qualcomm, supported by Prof Saunders. Their case advanced in closing was that the invention is obvious because the natural way for a skilled team to implement what is described in the Qualcomm document would be the method claimed.
108. Unwired Planet, supported by Dr Moss, contended the invention was not obvious. Unwired Planet contended that the defendants' approach over Qualcomm was plagued with hindsight and in fact involved an inappropriate step by step approach which was not indicative of obviousness. Part of Unwired Planet's case was that the natural approach of the skilled person to the problem of self-organising network was very different from the case advanced by the defendants. This approach was explained by Dr Moss in his reports and referred to at trial as the "natural solution". In this judgment I will call it the Holma & Toskala approach.
109. In order to address the issue it is convenient to focus on some distinct topics. The topics are:
 - i) The Holma & Toskala approach
 - ii) Neighbour cell lists in phones in LTE
 - iii) Normal measurement reporting
 - iv) Transmitting only when necessary
 - v) How difficult is the unique ID to obtain?
 - vi) Difficulties identifying a cell from a PCI
 - vii) Qualcomm as a "good starting point"
 - viii) Location of decision making
 - ix) What is obvious over the Qualcomm document

The Holma & Toskala approach

110. In GSM and UMTS the networks were managed centrally. The operators used software tools to assist in the process. Dr Moss's clear view was that a skilled team given the task of implementing some form of self-organising features in LTE would have recognised that the natural way to do it was centrally, or least in a distributed way involving a degree of aggregation and so not at the level of individual base stations. In this context I will use the word centrally to include such a distributed arrangement, the contrast being with something managed locally at an eNode B. Dr Moss referred to passages in the textbook by Holma & Toskala (WCDMA for UMTS 3rd Ed John Wiley & Sons (2004)) which discussed the centralised way in which network planning and optimisation was or could be done in UMTS.

111. The Holma & Toskala approach for implementing self-organising features in LTE would involve the phones sending measurement reports to the serving eNode B using the non-unique PCI to identify the cells. The measurement reports would include detected set reports and so would include cells which had been found which were not on the phone's neighbour list. All the phone would need to do to carry out this task would be to identify the PCIs, make appropriate measurements and report. These reports would be sent by the eNode B to the OMC, which is a central entity. The transmission of the information to the central OMC may also involve some aggregation of the information. The OMC would determine whether additional detected cells could then be added as neighbours. This analysis would be centralised. The new cell would be uniquely identified by associating the PCI with GPS and other geographical data, which was something network optimisers already undertook in existing systems. The neighbour lists held by eNode Bs would be controlled centrally in this way. This method is quite different from the claimed invention.
112. The method would not use unique identifiers at all and would not require phones to undertake anything other than the normal measurement reporting they undertook in UMTS using the PCIs.
113. The ideas embodied by the Holma & Toskala approach would be part of the common general knowledge and I accept that it was one approach which would be open to a skilled team thinking about how to implement a self-organising system, based on their common general knowledge. It amounts essentially to automating steps which were done this way by networks optimisers in the existing networks. Those networks optimisers already used software tools to help them. These tools included the ability to use PCI and geographical information to identify a cell. There was a debate in the evidence about the extent to which those tools could or would be permitted to undertake this sort of task entirely automatically. The idea of using them existed but I am not satisfied that operators actually allowed software to update a network automatically without manual checking. This was possible but I accept Prof Saunders' evidence that manual oversight was maintained. The debate about the reliability of this geographical approach to identifying a cell is addressed below.

Neighbour cell lists in phones in LTE

114. An important aspect of the defendants' case rested on the argument that the skilled team would know as a matter of common general knowledge that they could not proceed on the assumption that a phone would be provided with a neighbour cell list in LTE. From that premise the defendants argued that normal measurement reporting which phones would undertake in LTE would necessarily therefore not be like UMTS monitored set reporting, based as it was on a neighbour cell list. Rather, what would be expected to be "normal" measurement reporting in LTE would be the same as UMTS detected set reporting. In other words the phone would report on all cells it could detect above a certain threshold and would therefore inevitably pick up any new cell. In the common general knowledge section above I have already rejected the premise on the facts. To the skilled team at the priority date, the most that can be said is that the skilled team would have been aware that a proposal to consider the removal of neighbour cell lists in phones had been made and would have been aware of a debate on the issue which was underway and was not finished. The skilled team did not think neighbour cell lists in phones had been abolished nor did they think a requirement for such lists was likely to be abolished.

115. Moreover I am sceptical about this reasoning about the status of neighbour cell lists in any event. It smacks of hindsight by over emphasising the debate about neighbour cell lists in the phone in order to justify taking a particular path which may lead towards the invention. To the extent that a skilled person thought along these lines at all when thinking about Qualcomm (which I doubt), they would regard Qualcomm as a proposal which had been put forward at a time before there was any hint that neighbour cell lists in phones might be reviewed. So as a proposal, it would be understood as a suggestion made in the context in which phones had neighbour cell lists. There would be no reason (barring hindsight) for a skilled team to embark on thinking through the implications of how one might implement Qualcomm without phone based neighbour cell lists.
116. Finally I note that Prof Saunders' opinion that the invention was obvious was expressed originally without any thought that phone based neighbour cell lists may be under review. His view that the invention was obvious was on the implicit assumption that the phone would have a neighbour cell list.

Normal measurement reporting

117. As mentioned already, the defendants submitted that Qualcomm would be read and understood by the skilled team in a context in which they would be assuming that normal measurement reporting by phones would occur anyway. Unwired Planet criticised this argument as too simplistic and as eliding different things. There is some force in the criticism as I shall explain but at the end of it, I agree with the defendants that the skilled team would approach Qualcomm in this way, as long as one is precise about what one means.
118. As put, the defendants' submission tended to obscure the difference between monitored set reporting and detected set reporting. Unwired Planet is right that that is not legitimate. The skilled team would understand both kinds of reporting and would understand how they differed. An important difference is that the team would know that in UMTS networks monitored set reporting was usually configured to occur more frequently than detected set reporting.
119. On the other hand the defendants are right that the skilled team would assume that LTE networks would allow for reporting of the same kind as was normally done in UMTS, that is to say relatively frequent monitored set reporting based on the phone's neighbour cell list, while detected set reporting would also occur albeit it would be scheduled to occur less frequently. The important thing for the purposes of the issues in this case is not monitored set reporting but detected set reporting. That is because monitored set reporting, based as it is on a neighbour cell list, is always concerned with known neighbours. I find that the skilled team would assume, based on their common general knowledge, that the LTE network would facilitate both monitored set reporting and detected set reporting of some kind. The skilled team would also assume that the information from the reports would, inter alia, be sent to a central management system of some kind, possibly in an aggregated form. Subject to the impact of their thinking about the Qualcomm document, the skilled team would assume that this reporting (both kinds) would be undertaken based on the neighbouring cell's PCI.

Transmitting only when necessary

120. The defendants put to Dr Moss that as a general proposition it was common general knowledge amongst those skilled in the art only to report information which is actually needed. Dr Moss did not accept this. It was suggested that his answers were evasive, but I do not accept that. The point Dr Moss was seeking to make in response to the question was that this idea was one of a number of factors which engineers take into account and there is always a trade off with other considerations. So a simple reporting structure may have its own advantages even though it means that redundant information is sometimes reported. An alternative could be a more complicated reporting structure which provides different reports in different circumstances. That may mean redundant information is never sent but involves an increase in complexity. In my judgment the correct way to describe the thinking of the skilled team on this is that the general concept of only reporting information which is actually needed, is one of a collection of entirely obvious general factors which the skilled team will take into account and trade off against other factors in designing a system.

How difficult is the unique ID to obtain

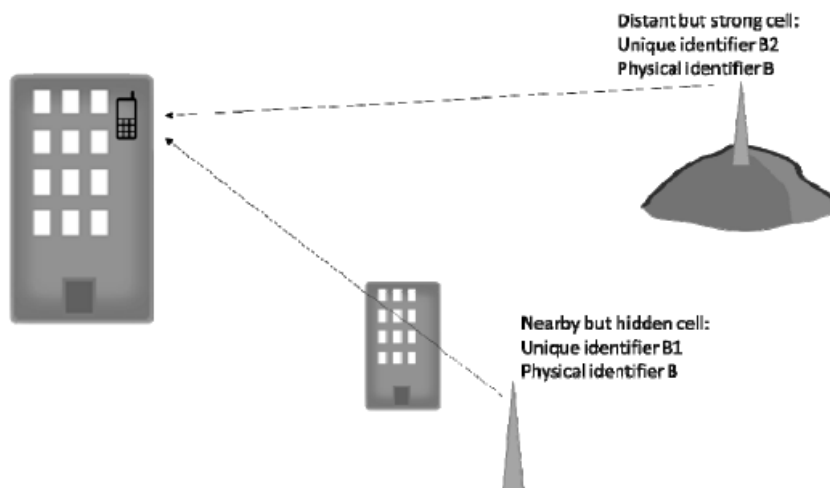
121. In UMTS each cell broadcast its unique ID code in a System Information Block (SIB). In the course of developing the UMTS standard it had at one stage been contemplated that phones might report the unique ID code of a neighbour to the serving cell but by the priority date that possibility had been effectively blocked by something referred to as the “logical override”. The unique ID code was read and used by a phone in Idle Mode as part of the cell reselection procedure but that was the only occasion in the UMTS standard in which a phone would read the unique cell ID. The unique ID of a neighbour cell was not read in Connected Mode. In order to read the unique ID of a neighbouring cell a phone has to acquire the scrambling code for the neighbour, which was on one channel (the CPICH) and then use it to decode the MIB which was broadcast in another channel. This was feasible but it took time and effort.
122. The defendants submitted that a skilled team approaching the Qualcomm document would take the view that acquiring the unique cell ID for a neighbouring cell in LTE was likely to be similarly possible but equally would involve some time and effort on the part of the phone, for analogous reasons as in UMTS (albeit the precise way in which the physical layer operates in LTE was going to be different from UMTS). Accordingly the skilled team would wish to minimise the extent to which phones were required to acquire the unique ID in LTE.
123. I find that the skilled team would know, in the context of thinking about whether and how to implement Qualcomm, that they could make the acquisition of the unique ID in LTE somewhat easier than it was in UMTS by specifying how often it should be broadcast and on what channel, but in the end the skilled team would always regard the acquisition of the unique ID of a neighbouring cell as a task which required further, material effort on the part of the phone over and above acquiring the PCI. It could be done but the effort required would always be taken into account as part of an engineering trade off as something to be minimised if it could be.

Difficulties identifying a cell from a PCI

124. The Holma & Toskala approach involves using geographical context information to relate a PCI to an actual cell. The parties did not agree about the reliability of this

technique. The argument is related to another dispute, about the problems said to be caused by cells situated on high sites and by phones in tall buildings. The common theme is that the arguments are concerned with cases in which trying to relate a cell to a PCI based on geographical information may produce the wrong answer.

125. A particular issue raised by Prof Saunders in relation to the Holma & Toskala approach is illustrated by Fig 6 from his second report. This involves two cells with the same PCI which are situated far apart. The figure is:



126. In the figure there is a phone at the top of a tall building which might be able to pick up a far away cell B2 and make a measurement report based on its PCI. There is another much closer cell with the same PCI but it is hidden from the phone for some reason. A simplistic geographical approach would associate the measurement report with cell B1 when it is in fact cell B2. Things are more complicated because one can also take into account predictions of radio propagation and path loss. In UMTS cells transmit data which states the power at which they are transmitting and so one can estimate how far away the transmitter is from a receiver by measuring received power and making assumptions about path loss. Prof Saunders described this as far from trivial in a three dimensional, complex and changing environment and also said it was not easy to estimate the likely impact of changing environmental conditions. A distinct issue is the accuracy of the information held centrally. If the centrally held data located the cell in the wrong place, that could affect the accuracy of a radio propagation estimate made using that information. Prof Saunders maintained that for these reasons the skilled team would regard using geographical context information as a way of associating a PCI with a specific cell as not sufficiently reliable for automation.
127. Unwired Planet submitted that the problems of high sites would be avoided by appropriate network planning and, if they arose in practice, would be dealt with by re-planning. This was addressed in Dr Moss' third report. There were common general knowledge techniques to avoid or solve the problem of high sites, such as reducing their coverage or output power or blacklisting so that a phone in a high building would never report such a cell or handover to it. Also microcells in affected buildings could be installed to mitigate the problem if it arose in practice.

128. In cross-examination Dr Moss accepted that problems like this could occur in practice. His view was that they would be identified from failed handover statistics and addressed, for example, by network planning. One approach was to give a unique PCI to a high cell. He accepted that the radio propagation models were not perfect but maintained they were very good at predicting nearby cells. He accepted that errors could occur with the centrally held information but his experience is that they were detected manually. Dr Moss did not regard the problems raised by Prof Saunders as significant.
129. On Prof Saunders' wider points about the drawbacks of using geographical context information with the PCI to identify a cell, Dr Moss's evidence was that while there had been problems in GSM, the problems had been solved in UMTS because of a large increase in the number of PCIs available. In a typical UMTS network PCIs were unique within at least a 12x12 grid of cells. If a problem arose the network could be replanned.
130. Unwired Planet submitted that in a properly planned network the likelihood that there would be a detected cell (which was rare anyway) from an eNode B at a high site which had not been properly configured was "once in a blue moon" and that the defendants' case here was contrived and unrealistic.
131. In their written closing (paragraph 203) Unwired Planet referred to papers in the cross-examination bundle (at tabs 3 and 4) which are said to show work done by Prof Kürner and others on this but I am not prepared to place weight on them without evidence explaining their implications.
132. Prof Saunders accepted in cross-examination that based on path loss calculations it was possible to avoid phones accessing cells that were a long distance away but he did not agree this dealt with the high site problem because in that case path loss was not a good indicator of distance. Also the fact a phone would not handover to such a cell (a "problematic cell") does not mean the problematic cell would not be reported as part of the detected set. Prof Saunders also agreed that problematic cells could be blacklisted and he agreed that it was not good network planning to have too much coverage from high base stations, but he maintained that the operators' capacity to stop it is constrained and said that it happens routinely. He also agreed that microcells could be used to mitigate the issues but said their usage was tiny.
133. I have used the term problematic cell as a convenient label although it was not used at trial. The problematic cell point has a knock on effect on neighbour cell lists. The network may know of the existence of a problematic cell which phones in one cell sometimes detect but which they should not be handed over to. Accordingly it would not be desirable to place the problematic cell on a neighbour cell list held by the phone even though it may be in the neighbour cell list held by the serving eNode B. Phones will not report on the problematic cell in monitored set reporting but they could do in detected set reporting.
134. An aspect of Prof Saunders' evidence on these issues involved femto cells but I do not accept they were common general knowledge at the priority date. They did not play any part in the thinking of the skilled team. I do accept that, entirely generally, the team would expect that the number of cells was going to increase significantly. That was something being taken into account in the design of LTE.

135. Prof Saunders was challenged on his view about the accuracy of information held in the O&M databases. He maintained his view, explaining how the errors could affect the propagation prediction. When it was put to him that getting the location of a cell wrong was rare, the Professor said that such optimisation problems happened daily and that getting the location of a cell wrong was “all too common”.
136. Overall, I preferred the evidence of Prof Saunders to Dr Moss on the issues relating to the difficulties of identifying a cell from a PCI. I find that the skilled team would not regard the technique of using geographical context information and radio propagation estimates as way of identifying a cell from a PCI which was sufficiently reliable to be allowed to run automatically. I also find that the skilled team would understand and have in mind the idea of problematic cells. They would not assume that the neighbour cell list held by a phone would always contain every neighbouring cell known to the eNode B.

Qualcomm as a “good starting point”

137. The defendants submitted that the Qualcomm document would be regarded by the skilled team as a good starting point for implementing a method of creating, updating and optimising the eNode B’s neighbour cell list and that both experts gave evidence on this to like effect. I agree. It a significant point because the proposal in the document is quite different from the Holma & Toskala approach in three important respects, regardless of how the Qualcomm proposal would be implemented in detail. First the Qualcomm document is suggesting to the skilled person the idea of a self-configuring system which involves using the unique ID of a new neighbour cell as the means for identifying it. This had not been done before. It was not done in UMTS or GSM. It would be seen as a new and interesting idea. Second the proposal involves local updating of the neighbour cell list at the eNode B rather than a centralised approach. This again is new and would be seen as interesting. Third, the document locates itself firmly as a proposal for addressing the desire of network operators for standardised self-optimisation. That general desire was common general knowledge even though the NGMN document itself was not.
138. For these reasons in my judgment the skilled team would be well motivated to take what is proposed in the Qualcomm document forwards and look in detail at a way or ways of implementing it.

Location of decision making

139. One of the debates was about the location of decision making. Unwired Planet argued that the defendants were using hindsight in assuming the decision making would take place in the eNode B rather than in other places (such as more centrally or in the phone). Unwired Planet said that the defendants had assumed that functions which had been undertaken by the RNC in UMTS (such as managing neighbour cell lists) would all be moved down to the eNode B with abolition of RNCs which was to occur in LTE, whereas there was no reason why some functions, like this one, could not be moved up the hierarchy. This argument has force relating to obviousness over common general knowledge alone but it is not significant over Qualcomm for the reason I have already mentioned in the previous section as the second interesting aspect of Qualcomm. The document refers in terms to an eNode B “which would like to establish an association” with another eNode B. This would be understood as

described a scheme in which the serving eNode B makes important decisions, i.e. deciding to set up an X2 transport connection with a new neighbour (or not).

140. A further possible place for decision making is in the phone, on basis that neighbour cell lists remain in the phone. However again, while this may be significant in relation to common general knowledge alone, no skilled person reading the Qualcomm document would think that the phone was to be expected to make the decision that its serving eNode B should set up a transport connection with a neighbour.

What is obvious over the Qualcomm document

141. I turn to consider what would be obvious over the document. Various possible ways of implementing the proposal were canvassed in argument. As a matter of law the availability of different avenues may or may not show that a step is inventive. Multiple avenues can be indicative that one avenue, which leads to the invention, is not obvious but on the other hand the existence of a number of obvious ways forward does not mean one of them is not obvious. It depends on the facts.
142. The defendants submitted that the obvious way to implement the Qualcomm proposal was as an additional facility on top of normal measurement reporting (both monitored set reporting and detected set reporting) which the skilled team would expect was going to take place anyway and which would be based on the PCI. I agree. I find that a skilled team given the Qualcomm document would expect that the source eNode B was going to receive the normal detected set reports. The thinking of the skilled team would be as follows. The team would see that the Qualcomm proposal would be a good way of setting up an X2 transport connection with a new neighbour, if that was appropriate. Assuming the eNode B did want to set up a transport connection, the eNode B which had received normal detected set reports would instruct a phone or the phones in its cell to report the unique ID for the newly discovered eNode B so that the source eNode B could then acquire the IP address centrally using the unique ID as a key.
143. Part of this thinking would be that one would not want the eNode B to set up a new X2 connection just because a single phone in its cell had detected a new neighbour on one occasion. Rather the skilled team would think it likely that the operator would wish the eNode B to have received a number of reports, from multiple phones and possibly over a period of time, all finding the new neighbour with a good quality signal, before the criteria for establish an X2 connection were satisfied. The eNode B would be the obvious entity to handle this information, aggregating it to some extent perhaps over time and across multiple phones, and to make that decision.
144. Another part of the thinking of the skilled team in this respect would be that taking this approach would allow the eNode B reading the normal detected set reports to be able to distinguish between PCIs in the detected set reports which represented new neighbours it had not been aware of but wanted to add to its neighbour cell list, and PCIs from cells such as problematic cells, with which there was no reason to make an X2 connection.
145. Unwired Planet argued that the defendants' approach did not fit with the language of the document in various ways, as follows:

- i) The defendants' approach involves an instruction from the eNode B to the phone prompting the phone to decode and send the unique ID. That instruction is not in the document and is not consistent with Figure 1. It is correct that the instruction is not in the document but in my judgment it would be an obvious way forward which would occur to the skilled team. It is not ruled out by the figure and would be seen as an obvious way of using what is disclosed.
 - ii) The defendants' approach involves two measurement reports from a phone about the neighbouring eNode B whereas Qualcomm only mentions one. That is correct as far as it goes but not a strong point. As I have found, the team would have in mind that normal measurement reporting was going to occur.
 - iii) The word "finds" in the top left box in figure 1 means that phone finds the new neighbour at that stage and then sends the unique ID. In the defendants' approach the phone has already found the new neighbour and reported on it in a detected set report before the phone is asked for the unique ID. That is also correct on a careful reading of the language but I do not think the point means the skilled team would not think of the approach nor would it deflect them from it.
 - iv) Figure 1 shows a "measurement report" coming from the phone with the unique ID whereas in the defendants' approach the measurement report has already been sent before. In effect the defendants' approach involves a PCI measurement report and then a unique ID report which need not involve any measurement. I do not regard this as a strong point either. The expression is apt to refer to the unique ID report from the phone in any event and, furthermore, once the eNode B had asked the phone for the unique ID, there is no reason why more measured information could not be sent too.
146. Unwired Planet also submitted that in fact the way the skilled team would implement the Qualcomm document would be to specify that all detected set reporting would involve reporting both the PCI and the unique ID for all detected cells. Unwired Planet submitted this is what the document actually teaches but I do not agree, as I have said the document is unspecific. Nevertheless I accept this is an approach to putting the Qualcomm document into practice and I believe it would also occur to a team well motivated to take Qualcomm forward although it would not displace the defendants' approach. The approach has the virtue of simplicity but it has the drawback that it would require every phone in a cell to go to the trouble of deriving the unique ID for all cells detected in all detected set reporting. That would mean that the unique ID would be acquired and transmitted in the reports which the eNode B would aggregate before deciding whether to set up an X2 connection. It would also mean that unique IDs would be acquired and reported by phones for problematic cells. Unwired Planet submitted this was a feasible way of implementing the Qualcomm proposal and contended that the defendants, and Prof Saunders, over emphasised the drawbacks. I agree it is feasible but I do not agree the drawbacks were over emphasised. I find that while the skilled team would indeed think about this approach, they would see it as having important drawbacks given the effort needed to acquire the unique IDs and the fact that it inevitably reports information, obtained at a cost in terms of resources, which the eNode B does not and may never need. Acquiring the unique ID only in detected set reporting would clearly be much less

burdensome than doing that in monitored set reporting (this mattered as part of the no neighbour cell lists in phones point) but it would still be seen as significant. I recognise that detected set reporting would be much less frequent than monitored set reporting and only involves reporting on “new” cells from the phone’s point of view, i.e. cells not on the phone’s neighbour cell list.

147. I find that the skilled team would see both approaches as having obvious advantages and disadvantages which would be balanced in a standard and wholly obvious trade off exercise. The defendants’ approach trades off extra signalling (a message from the eNode B to the phone) against a lower burden on detected set reporting. Unwired Planet’s approach reduces the signalling but increases the burden on detected set reporting. Since both approaches are obvious over Qualcomm, it is not necessary to go on and consider which would be chosen, but in case it matters, I find that the skilled team would firmly prefer the defendants’ approach. The burden of an extra message from the eNode B is obviously worth it as opposed to requiring all detected set reporting to include the unique ID of all detected cells.
148. I reject the submission that the defendants’ approach is based on hindsight knowledge of the invention. Although one aspect of the defendants’ case was based on hindsight (the no neighbour cell lists in phones point) I did not detect hindsight in the other issues when considering the case over Qualcomm.
149. Unwired Planet also submitted that the defendants’ approach in fact involved numerous steps (citing *Technograph*). I have dealt with what I regard as the important steps in context already. Again, starting from Qualcomm, I do not accept this criticism of the defendants’ approach.
150. The only significant point on secondary evidence was the reaction of Nokia to the invention once it had been proposed by Ericsson to the relevant 3GPP RAN working group. This could be found in document R3-072212 for the WG3 meeting in Jeju, Korea on 5th-9th November 2007 as well as document R2-074869 for WG2. Unwired Planet contended that Nokia were concerned about what they regarded as the complexity of the Ericsson invention and preferred a centralised approach based on PCIs. The defendants contended that in fact consideration of the documents assists their case that the skilled team would see problems with the Holma & Toskala approach. The matter was debated by Dr Moss and Prof Saunders but I do not derive anything significant either way on the question of obviousness over Qualcomm.
151. Standing back, I find claim 12 of the 287 patent is obvious over the Qualcomm document. On that basis all the other claims of both the patents are also obvious.

Common general knowledge alone

152. I can deal with this shortly because I was wholly unpersuaded that a skilled team thinking about self-configuration and SON based on the common general knowledge alone would think of using the unique ID code at all. It was not used in this way in UMTS or anywhere else in the common general knowledge. I have taken into account the testimony from Prof Saunders in cross-examination on this (at T5/692-745, closing paragraph 114) on which the defendants placed particular emphasis but I was not convinced. Without that point the argument does not get off the ground.

Sufficiency

153. I reject this argument, irrespective of the conclusion on inventive step. There was no evidence led by the defendants in support of it. In closing the defendants relied on two aspects of the testimony of Dr Moss in cross-examination. First Dr Moss said that the skilled team would have difficulty implementing the patent, because of how little had been fixed in the LTE standard at time. When asked to accept that the patent set a series of problems for the implementer, he said “Yes, I do not think the patent tells you exactly how to implement the invention. I may be wrong but I do not believe it gives specifics.” Second the defendants rely on statements by Dr Moss that implementing the patent would be “verging on the grounds of inventiveness” and “challenging”.
154. The defendants’ submissions list a raft of topics: implementing messaging, phone states, measurement and reporting capabilities in different states, limitations on detected set reporting and the fact that messaging had not yet been defined in the LTE standard at the time. However no specific difficulty has been identified or relied on by the defendants to establish their case that this could not be done. Dr Moss did not go as far as stating that it could not be done and the defendants do not rely on anything said by Prof Saunders. It is true that at the relevant time the LTE standard was under development. That would inevitably makes things difficult for a skilled person (or team) but that is not because there was anything particularly difficult about putting the invention into practice, given the patent. It is also true that the patent contains no detailed examples but it contains a detailed description and, as I have said, no specific problem is established. So I reject the submission on the facts.
155. Part of the way the defendants put their case was to submit that the sparse nature of the disclosure in the specification to support the implementation of the claimed invention meant that the patent assumed a high level of skill on the part of the skilled person and so, for obviousness, a higher level of skill on the part of the skilled person should be applied. I believe this proposition is wrong in principle. It is close to the argument which was rejected in Conor v Angiotech and should be rejected for the same reasons. It is the properly construed patent claim which counts not the content of the specification, such as the availability of examples. The latter cannot alter the level of skill required of the skilled person when considering inventive step. Otherwise two claims for the same invention over the same prior art would be judged differently for obviousness depending on whether one patent contained a worked example and the other did not. If I may borrow in part the words of Lord Hoffmann in paragraph 19 of Conor, a patentee is entitled to have the question of obviousness determined by reference to the claim and the objectively determined skilled person, not by reference to the extent of their disclosure in the description.

Added matter

156. The defendants allege that claims 11 and 17 of 514 (the unconditionally amended set – annex 2) are invalid for added matter. The point was not focussed on in great detail by the parties at trial but it remains in issue.
157. The law on added matter can be briefly stated as follows. A patent is invalid if the matter disclosed in the specification extends beyond that disclosed in the application as filed. Amendments which have this effect are prohibited by s76(2) of the 1977 Act

but if they have occurred, the patent will be invalid (s72(1)(d)) unless a further permissible amendment cures the difficulty. The provisions of the 1977 Act have the same effect as Art 123(2) of the EPC. The basic approach to be followed is that explained by Aldous J as he then was in *Bonzel v Intervention* [1991] RPC 553. Added matter has been considered by the Court of Appeal a number of times. Two significant cases are *Vector v Glatt* [2007] EWCA Civ 805 and *AP Racing v Alcon* [2014] EWCA Civ 40.

158. The objection is about words in claims 11 and 17 of 514. Although Unwired Planet does not contend that those claims are independently valid, the defendants maintain their objection. I will deal with it. The words are:

“establishing a transport connection by finding in a lookup map a mapping of the unique cell identity of the second communications cell with a network address of the radio base station that serves the second communications cell.”

159. The context in which the words appear can be seen in Annex 2. Claim 11 is a claim to a method for self-configuring of cell neighbours in a wireless telecommunication system. Claim 17 is a claim to a wireless telecommunications network operable in a certain way.

160. The claims are not limited to LTE networks but it is convenient to think of them in that way given the rest of this judgment. From an LTE point of view, the words refer to the idea that the serving eNode B would set up an X2 transport connection with a neighbouring eNode B by using the unique ID for that neighbouring eNode B as a key to obtain the IP network address of the neighbour. The mapping referred to could be in a DNS server of the kind contemplated by the Qualcomm document but nothing turns on that. The fact this idea is in the Qualcomm document is not relevant.

161. The application as filed was published as WO2008/104196A1. The defendants point out, correctly, that the passage of text quoted above does not appear verbatim in the application. They submit it amounts to a disclosure of new matter. The question is whether what is disclosed can be derived clearly and unambiguously from the application by a person skilled in the art, in the light of their common general knowledge. The defendants contend that the closest the application comes is in two passages which in effect have to be linked together to produce the offending disclosure, however these two passages are not linked in the application and the skilled person would not link them. So there is added matter. The two passages are labelled A and B for convenience. They are:

(A) “When the serving cell retrieves the unique cell identity (step 119) it may now add the newly discovered neighbour cell to its neighbour cell set (step 121) and establish a transport connection to it.”

(Page 4, lines 21-23 (using the published page number))

(B) “Cell lookup maps the unique identity (UCID) to the address of the realising node of that cell. For example, in LTE, this can be an ordinary DNS, mapping the cell identity to an IP address.”

(Page 5, lines 24-25 (using the published page number))

162. So while text A refers to receiving the unique ID and setting up the transport connection, it does not mention mapping the unique ID to the IP address of the neighbouring cell. That is in text B. The defendants submit that there is nothing in the application which teaches the skilled person that the purpose of B is to do A nor is there a disclosure that A is achieved by doing B.
163. In my judgment there is no added matter here, for the reasons explained below.
164. Passage A forms part of the detailed description of a method embodying the invention disclosed which starts at p4 line 5 of the application and is based on the steps set out in blocks in figures 3 to 6. Each block in the diagram is a step in the method. Passage A is the part of that description which corresponds to the last two steps in the sequence (Fig 6, step 119 “Receive Identity information” and step 121 “Update neighbour cell list”). This part of the disclosure is generic in that it is not focussed on a particular kind of network (GSM, UMTS, LTE or anything else – see application page 2 line 32-33). The skilled person knew that LTE was an IP network and knew that LTE was to include direct transport connections between eNode Bs via the X2 interface. The text in passage A teaches that when the serving cell has received the unique ID of a neighbour, it (the serving cell) may now establish a transport connection to it. The skilled person would understand this in the context of LTE as the serving eNode B establishing an X2 connection with the new neighbour over the IP network.
165. The whole method is summarised in the paragraph on p4 of which passage A is a part. The application then mentions an alternative idea at p4 line 28-30 (no instruction from the base station). It may include the text at p4 line 32-p5 line 2. Then, starting at p5 line 4 are passages which have a general significance to what has gone before. The three paragraphs starting at p5 line 4 explain various advantages of what has been described already. The fourth paragraph is passage B. It would be understood by the skilled reader as a description with application to what has been described already. Passage B describes a table which maps the unique ID to an address (the grammar of the words “lookup map(s)” is different in the granted claims but nothing turns on that). The address is clearly a network address and the skilled reader would understand its purpose is to allow for the establishment of the transport connection referred to in passage A. This is the case in general terms but it is all the more so when taking into account the skilled person’s knowledge of LTE. Passage B also refers to LTE as an example and to an IP address as an example of the address obtained from the lookup process. The skilled reader would understand that the IP address is the means by which the serving eNode B will establish the X2 transport connection with its neighbour.

Clarity

166. The clarity objections related to the conditional amendments. It was common ground that although clarity is not an objection to validity (unless it amounts to an insufficiency) it is an objection to allowing claim amendments (c.f. *Hospira v Genentech* [2014] EWHC 3857 (Pat) paragraph 161 on the same basis). As I have found all the claims invalid for obviousness, I strongly suspect no-one cares but I will address the objections briefly just in case.

167. The first class of objections is to amendments proposed to claim 1 of 287 and to claims 1 and 6 of 514. They form part of the amendments advanced by Unwired Planet conditionally (Annexes 3 and 4). The amendments to claim 1 of 287 which are objected to are shown underlined below:

Claim 1 of 287:

“(a) A method of operating a mobile terminal in a wireless telecommunication network [...] the method comprising:

communicating with a radio base station

(b) determining ...

(c) detecting ...

(d) reporting ...

(e) receiving ...

(f) detecting ...

g) reporting the detected unique cell identifier information for the second communications cell to the radio base station of the first communications cell to enable the neighbour cell set of the first communications cell to be updated with the newly discovered second communications cell.”

168. Amendments of a similar kind are proposed for claim 1 of 514. They are:

Claim 1 of 514:

“(a) A method of operating a mobile terminal in a wireless telecommunication network [...] the method comprising:

(b) communicating with a radio base station

(c) [...] receiving ...

(d) retrieving ...

(e) reporting the unique cell identity for the second communications cell to the radio base station of the first communications cell to enable a transport connection to be established with the newly discovered second communications cell.”

169. The amendments objected to for claim 6 of 514 are:

Claim 6 of 514:

“(a) A mobile terminal...

(b) the terminal comprising a controller...

(c) wherein [...] the controller in response to a receipt of an instruction to also retrieve the unique cell identity of the second communications cell if the second communications cell is not included in the neighbour cell set of the first communication cell from the radio base station of the first communication cell is operable to:

(d) detect the unique cell identity of the second communications cell, and

(e) report the unique cell identity of the second communications cell to the radio base station of the first communications cell to enable a transport connection to be established with the newly discovered second communications cell.”

170. The objection in each case is similar. Each of the amendments seeks to add a feature which relates to an aspect of the network into a claim which is related to the phone. Both claims 1 are to methods of operating a mobile terminal and claim 6 is to a mobile terminal as a product. Yet the amendments seek to introduce aspects of the network. The feature added to claim 1 of 287 refers to updating a neighbour cell list, the feature added to claim 1 of 514 relates to establishing a transport connection. Both features are added to claim 6 of 514. The defendants argue that the amendments lack clarity because they create uncertainty as to whether and to what extent any updating of a neighbour cell list or establishment of a transport connection has to be performed or is intended to be performed as a result of the claimed method.
171. What the defendants are getting at is that the updating of the neighbour cell list and establishment of the transport connection are not things which the phone does, at least not in the way the invention is described in the patent. They are things which are done by the network side of the system. So in LTE they are done by the eNode B. So the argument is that by putting this language into a claim which is a claim to a phone (or to a method of operating a phone), it seems to mean that these steps are to be carried out by a phone, when they are not – hence ambiguity. One point was whether the words would be thought to be limitations at all. I am sure they would be. The skilled person would think the patentee has introduced these words into the claims to function as a limitation on their scope.
172. For the reasons given below I reject the submission that the amendments to claims 1 are objectionable on this ground but I uphold the objection to claim 6.
173. The words introduced into claim 1 of 287 qualify the phrase starting with “reporting...”. At this stage in the method of claim 1 it is the phone which reports the detected unique cell ID for the second cell (the neighbour) to the first cell (the serving cell). The new words describe the purpose of that report. It is to enable the neighbour cell list of the first cell to be updated with the new neighbour cell. The reader would understand from the patent as a whole that the neighbour cell list to be updated is stored by the network rather than the phone (the first paragraph of the amended claim says so). The effect of the words objected to would be that a report from a phone which does not enable that neighbour cell list to be updated is not within the claim. There is no problem of clarity. The phone has to make a report which is suitable for

that purpose. To take a silly example, a report from the phone in a secret code which the network could not understand is excluded. Note that the claim says “to enable ...” and so as amended claim 1 does not include a step of updating the neighbour cell list, the claimed process ends with the phone reporting something to the serving cell.

174. The same answer applies to claim 1 of 514. There the words objected to introduce a requirement that the report from the phone to the serving cell must be to enable the transport connection to be established. The reader understands that the transport connection is established by network elements. The method claim as amended requires a phone to make a report which is suitable for that purpose. A report which was not suitable is excluded. The claim as amended does not include a step of establishing the transport connection, the claimed process ends with the phone reporting something to the serving cell.
175. Although at first I thought the same answer applied to claim 6 of 514, I have concluded it does not. Claim 6 is a claim to a phone suitable for use in a wireless telecommunications network with certain characteristics. The phone has a controller and that controller has to have certain properties. One property is to be “operable to” do steps (d) and (e) in certain circumstances. The relevant circumstance is that the controller has to be operable to do the acts in response to the receipt of an instruction “to also retrieve” the unique ID of a neighbour if that neighbour is not on the neighbour cell list of the serving cell. The word “also” makes sense because in the amended claim there is a feature that this has to be possible subsequent to a prior determination and report of the non-unique ID.
176. The claim is unclear whether the phone has to work out if the neighbour is on the neighbour cell list or not. Given the patent, the reader would not expect that to be a task allocated to the phone and would doubt the claim should be that way. They might think the phone just has to have the capacity to perform the relevant task in the relevant circumstances. The problem is the conditional words which mean in effect “if the neighbour cell is not on the neighbour cell list”. The reader would think these words relate to a decision made by the serving cell. Unwired Planet submitted this amendment simply describes the circumstances in which a phone receives an instruction but I do not think it is that simple. As a capacity of the phone, how can it make any difference whether the serving cell has asked for a unique ID in that circumstance or not. Does the claim mean that the phone has to check that the serving cell is only asking for the unique ID because the neighbour is not on the neighbour cell list? Do the words mean the phone is supposed to confirm that the neighbour is not on the neighbour cell list (or at least be capable of doing that)? I very much doubt the reader would think the draughtsman meant that but given that the claim relates to capacities of the phone, it is not clear. It is the amendment which would introduce this ambiguity. The ambiguity is not trivial and I would not allow claim 6 to be amended this way.
177. The other objection to claim 6 (feature (e)) is not a good one. It is the same as the objections to claims 1 and I reject it for the same reason.
178. The second class of objections were taken by the Comptroller to duplicative claims but Unwired Planet agreed to drop them and it does not arise.

179. If the conditional amendments to 514 were pressed, I would be minded to permit the amendments save that claim 6 would be amended as proposed but without the words “if the second communications cell is not included in the neighbour cell set of the first communication cell”. In that form the claim would be unobjectionable.

Conclusion

180. The patents are each invalid for obviousness and will be revoked.

Postscript

181. Once the draft judgment had been circulated the legal teams for the defendants, bearing in mind their duties as explained in *In re T (A Child) (Contact: Alienation: Permission to Appeal)* [2002] EWCA Civ 1736 at paragraph 50, raised a concern that while the judgment addressed unconditional claim 12 of 287 it might be said not to have addressed claim 12 of 287 in its conditionally amended form, albeit, they submitted, the findings in the judgment do render that claim obvious. They invited me to add an additional passage to clarify the situation, particularly in relation to the amendment to feature 12c (see Annex 3).
182. In fact the generality of the second sentence of paragraph 17 of this judgment was intended to be a finding covering all the claims in issue. Though this hardly needs saying, it was a statement made after actively considering all the claims in issue, both unconditional and conditional. The sentence does not make explicit the basis on which I reached that conclusion and that is the cause of the difficulty. It was not based on deciding that unconditional claim 12 was the narrowest claim. Given the plethora of claims and claims features and the way the parties’ positions shifted, I decided not to try and work that out. It was a view formed in the context of the particular obviousness cases in issue. Of all the claims and claim features, nothing seemed to me to make any difference if unconditional claim 12 was obvious. That is what the sentence was intended to mean. However conditionally amended claim 12 could be narrower in scope than unconditional claim 12 as a result of feature 12c and so, in the context of different arguments, the conclusion might not follow. Therefore the additional paragraph is justified. This is it:
- i) There are various differences in wording between the unconditional and conditionally amended form of claim 12 of 287. The only significant one is feature 12c. It effectively focusses the claim to detected set reporting using a PCI. That is the basis on which I have considered obviousness over Qualcomm. What I have called the defendants’ approach over Qualcomm, which I have found to be obvious, would satisfy feature 12c and conditionally amended claim 12 of 287 as a whole. Therefore that claim is obvious over Qualcomm.

Annex 1
287 – Amendment A

	Claim 1
1a	A method for operating a mobile terminal in a wireless telecommunications system which defines a plurality of communications cells, the method comprising: communicating with a radio base station which serves a first communications cell;
1b	determining (101) at least one operating parameter for a second communications cell;
1c	detecting non-unique identifier information for the second communications cell;
1d	reporting (103) parameter information relating to the or each operating parameter for the second communications cell and reporting the detected non-unique identifier information to the radio base station of the first communications cell, wherein the method further comprises:
1e	receiving (113) an instruction from the radio base station of the first communications cell;
1f	detecting (115) unique cell identifier information for the second communications cell upon receipt of the instruction; and
1g	reporting (117) the detected unique cell identifier information for the second communications cell to the radio base station of the first communications cell.
	Claim 6
6a	A mobile terminal (4) for use in a wireless telecommunications system which defines a plurality of communications cells, the terminal comprising means for carrying out the steps of a method as claimed in any one of the preceding claims.
	Claim 7
7a	A mobile terminal (4) as claimed in claim 6
7b	comprising a controller for communicating with a radio base station which serves a first communications cell, wherein the controller is operable to:
7c	determine (101) at least one operating parameter for a second communications cell;
7d	detect non-unique identifier information for the second communications cell;

7e	report (103) parameter information relating to the or each operating parameter for the second communications cell and report the non-unique identifier information to the radio base station of the first communications cell;
7f	receive (113) an instruction from the radio base station of the first communications cell if the detected non-unique identifier information is not included in a neighbouring cell set of the first communications cell;
7g	detect (115) unique cell identifier information for the second communications cell upon receipt of the instruction; and
7h	report (117) the detected unique cell identifier information for the second communications cell to the radio base station of the first communications cell.
	Claim 12
12a	A method for controlling resources in a wireless telecommunications system which defines a plurality of communications cells, the method comprising:
12b	communicating with a mobile terminal operating in a first communications cell;
12c	receiving (107) non-unique identifier information and parameter information relating to at least one operating parameter for a second communications cell from the mobile terminal; and
12d	defining (109) a neighbour cell list for the mobile terminal, the neighbour cell list including the second communications cell, wherein the method further comprises:
12e	determining (111), from the non-unique identifier information, whether unique cell identity information is required for the second communications cell; and, if such unique identity information is required:
12f	transmitting (111) an instruction to the mobile terminal;
12g	receiving (119) unique cell identifier information relating to the second communications cell from the mobile terminal; and
12h	defining (121) a handover candidate cell list for the mobile terminal, the handover candidate cell list including the second communications cell.
	Claim 16
16a	A wireless telecommunications network which defines a plurality of communications cells, the network comprising network resources operable to:
16b	communicate with a mobile terminal operating in a first communications cell;

16c	receive (107) non-unique identifier information and parameter information relating to at least one operating parameter for the second communications cell from the mobile terminal;
16d	define (109) a neighbour cell list for the mobile terminal, the neighbour cell list including the second communications cell;
16e	determine (111), from the non-unique identifier information, whether unique cell identity information is required for the second communications cell; and, if such unique identity information is required:
16f	transmit (111) an instruction to the mobile terminal;
16g	receive (119) unique cell identifier information relating to the second communications cell from the mobile terminal; and
16h	define (121) a handover candidate cell list for the mobile terminal, the handover candidate cell list including the second communications cell.
	Claim 20
20a	A network as claimed in anyone of claim 16 to 19,
20b	wherein the network resources are provided by a radio base station.

Annex 2
514 – Amendment A

	Claim 1
1a	A method for operating a mobile terminal in a wireless telecommunications system which defines a plurality of communications cells in which a non-unique cell identity and a unique cell identity are transmitted, the method comprising:
1b	communicating with a radio base station which serves a first communications cell;
1c	receiving (113) a request from the radio base station to retrieve the unique cell identity of a second communications cell among the plurality of communications cells;
1d	retrieving (115) the unique cell identity of the second communications cell; and
1e	reporting (117) the unique cell identity of the second communications cell to the radio base station of the first communications cell.
	Claim 2
2a	A method as claimed in claim 1,
2b	wherein the step of receiving a request is preceded by the steps of determining (101) the non-unique cell identity of the second communications cell
2c	and reporting (103) the non-unique cell identity of the second communications cell to the radio base station that serves the first communications cell.
	Claim 6
6a	A mobile terminal (4) for use in a wireless telecommunications system which comprises a plurality of communications cells in which a non-unique cell identity and a unique cell identity are transmitted,
6b	the terminal comprising a controller (42) for communicating with a radio base station which serves a first communications cell,
6c	wherein the controller in response to a receipt of an instruction from the radio base station of the first communications cell is operable to:
6d	detect (115) unique cell identity information for a second communications cell; and
6e	report (117) the unique cell identity information for the second communications cell to the radio base station of the first communications cell.
	Claim 11
11a	A method for self configuring of cell neighbours in a wireless telecommunications system which comprises a plurality of communications cells in which a non-unique cell identity and a unique cell identity are transmitted, the method comprising:

11b	communicating with a mobile terminal operating in a first communications <u>cell</u> ;
11c	requesting (111) the mobile terminal to retrieve the unique cell identity of a second communications cell;
11d	receiving (119) the unique cell identity of the second communications cell from the mobile terminal; and
11e	establishing a transport connection by finding in a lookup map a mapping of the unique cell identity of the second communications cell with a network address of the radio base station that serves the second communications cell.
	Claim 12
12a	A method as claimed in claim 11,
12b	wherein the step of requesting the unique cell identity is preceded by the step of: receiving (107) from the mobile terminal a non-unique cell identity of the second communications cell.
	Claim 16
16a	A method as claimed in anyone of claims 11 to 15
16b	as performed by a radio base station.
	Claim 17
17a	A wireless telecommunications network which defines a plurality of communications cells in which a non-unique cell identity and a unique cell identity are transmitted, the network comprising network resources operable to:
17b	communicate with a mobile terminal operating in a first communications cell;
17c	request (111) the mobile terminal to retrieve the unique cell identity of a second communications cell;
17d	receive (119) from the mobile terminal a unique cell identity of the second communications cell;
17e	establish a transport connection by finding in a lookup map a mapping of the unique cell identity of the second communications cell with a network address of the radio base station that serves the second communications cell.
	Claim 22
22a	A network as claimed in anyone of claim 17 to 21,
22b	wherein the network resources are provided by a radio base station (2).

Annex 3
287 – Amendment B

	Claim 1
1a	A method for operating a mobile terminal in a wireless telecommunications system <u>network</u> which defines a plurality of communications cells, <u>the network storing a neighbour cell set, the neighbour cell set comprising known neighbours of a first communications cell</u> , the method comprising: communicating with a radio base station which serves the <u>a</u> first communications cell;
1b	determining (101) at least one operating parameter for a second communications cell;
1c	detecting non-unique identifier information for the second communications cell;
1d	reporting (103) parameter information relating to the or each operating parameter for the second communications cell and reporting the detected non-unique identifier information to the radio base station of the first communications cell, wherein the method further comprises:
1e	receiving (113) an instruction from the radio base station of the first communications cell <u>to also retrieve unique cell identifier information relating to the second communications cell if the second communications cell is not included in the neighbour cell set of the first communications cell</u> ;
1f	detecting (115) <u>the</u> unique cell identifier information for the second communications cell upon receipt of the instruction; and
1g	reporting (117) the detected unique cell identifier information for the second communications cell to the radio base station of the first communications cell, <u>to enable the neighbour cell set of the first communications cell to be updated with the newly discovered second communications cell</u> .
	Claim 6
6a	A mobile terminal (4) for use in a wireless telecommunications system <u>network</u> which defines a plurality of communications cells, the terminal comprising means for carrying out the steps of a method as claimed in anyone of the preceding claims.
	Claim 7
7a	A mobile terminal (4) as claimed in claim 6
7b	comprising a controller for communicating with a radio base station which serves a first communications cell, wherein the controller is operable to:
7c	determine (101) at least one operating parameter for a second communications cell;

7d	detect non-unique identifier information for the second communications cell;
7e	report (103) parameter information relating to the or each operating parameter for the second communications cell and report the non-unique identifier information to the radio base station of the first communications cell;
7f	receive (113) an instruction from the radio base station of the first communications cell if the detected non-unique identifier information is not included in <u>athe neighbouring cell set of the first communications cell</u> ;
7g	detect (115) unique cell identifier information for the second communications cell upon receipt of the instruction; and
7h	report (117) the detected unique cell identifier information for the second communications cell to the radio base station of the first communications cell.
	Claim 12
12a	A method for controlling resources in a wireless telecommunications <u>system network</u> which defines a plurality of communications cells, <u>the network storing a neighbour cell list, the neighbour cell list comprising known neighbours of a first communications cell</u> , the method comprising:
12b	communicating with a mobile terminal operating in <u>athe first communications cell</u> ;
12c	receiving (107) non-unique identifier information and parameter information relating to at least one operating parameter for a second communications cell from the mobile terminal, <u>the second communications cell not being included in a neighbour cell list of the first communications cell</u> ; and
12d	defining (109) a neighbour cell list for the mobile terminal, the neighbour cell list including the second communications cell, wherein the method further comprises:
12e	determining (111), from the non-unique identifier information, whether unique cell identity information is required for the second communications cell; and, if such unique identity information is required:
12f	transmitting (111) an instruction to the mobile terminal <u>to also retrieve unique cell identifier information relating to the second communications cell</u> ;
12g	receiving (119) <u>the unique cell identifier information relating to the second communications cell from the mobile terminal, to enable the neighbour cell list of the first communications cell to be updated with the newly discovered second cell</u> ; and
12h	defining (121) a handover candidate cell list for the mobile terminal, the handover candidate cell list including the second communications cell.
	Claim 16

16a	A wireless telecommunications network which defines a plurality of communications cells, <u>the network storing a neighbour cell list, the neighbour cell list comprising known neighbours of a first communications cell,</u> the network comprising network resources operable to:
16b	communicate with a mobile terminal operating in <u>a</u> the first communications cell;
16c	receive (107) non-unique identifier information and parameter information relating to at least one operating parameter for the second communications cell from the mobile terminal, <u>the second communications cell not being included in a neighbour cell list of the first communications cell;</u>
16d	define (109) a neighbour cell list for the mobile terminal, the neighbour cell list including the second communications cell;
16e	determine (111), from the non-unique identifier information, whether unique cell identity information is required for the second communications cell; and, if such unique identity information is required:
16f	transmit (111) an instruction to the mobile terminal <u>to also retrieve unique cell identifier information relating to the second communications cell;</u>
16g	receive (119) <u>the</u> unique cell identifier information relating to the second communications cell from the mobile terminal, <u>to enable the neighbour cell list of the first communications cell to be updated with the newly discovered second cell;</u> and
16h	define (121) a handover candidate cell list for the mobile terminal, the handover candidate cell list including the second communications cell.
	Claim 20
20a	A network as claimed in any one of claims 16 to 19,
20b	wherein the network resources are provided by a radio base station.

Annex 4
514 – Amendment B

	Claim 1
1a	A method for operating a mobile terminal in a wireless telecommunications system <u>network</u> which defines a plurality of communications cells in <u>each of</u> which a non-unique cell identity and a unique cell identity are transmitted, <u>the network storing a neighbour cell set, the neighbour cell set comprising known neighbours of a first communications cell,</u> the method comprising:
1b	communicating with a radio base station which serves a <u>the</u> first communications cell;
<u>1c</u>	<u>subsequent to determining and reporting the non-unique cell identity of a second communications cell to the radio base station that serves the first communications cell,</u> receiving (113) a request from the radio base station to <u>also</u> retrieve the unique cell identity of a <u>the</u> second communications cell among the plurality of communications cells <u>if the second communications cell is not included in the neighbour cell set of the first communications cell;</u>
1d	retrieving (115) the unique cell identity of the second communications cell; and
1e	reporting (117) the unique cell identity of the second communications cell to the radio base station of the first communications cell, <u>to enable a transport connection to be established with the newly discovered second communications cell.</u>
	Claim 2
2a	A method as claimed in claim 1,
2b	wherein the step of receiving a request is preceded by the steps of determining (101) the non-unique cell identity of the second communications cell
2c	and reporting (103) the non-unique cell identity of the second communications cell to the radio base station that serves the first communications cell.
	Claim 6
6a	A mobile terminal (4) for use in a wireless telecommunications system <u>network</u> which comprises a plurality of communications cells in <u>each of</u> which a non-unique cell identity and a unique cell identity are transmitted, <u>the network storing a neighbour cell set, the neighbour cell set comprising known neighbours of a first communications cell,</u>
6b	the terminal comprising a controller (42) for communicating with a radio base station which serves a first communications cell,
6c	wherein, <u>subsequent to determining and reporting the non-unique cell identity of a second communications cell to the radio base station that serves the first communications cell,</u> the controller in response to a receipt of an instruction <u>to also retrieve the unique cell identity of the second communications cell if the second communications cell is not included in the neighbour cell set of the first communications cell</u> from the radio base station of the first communications cell is operable to:

6d	detect (115) <u>the</u> unique cell identity information for a of the second communications cell; and
6e	report (117) <u>the</u> unique cell identity information for of the second communications cell to the radio base station of the first communications cell, <u>to enable a transport connection to be established with the newly discovered second communications cell.</u>
	Claim 11
11a	A method for self configuring of cell neighbours in a wireless telecommunications system <u>network</u> which comprises a plurality of communications cells in <u>each of</u> which a non-unique cell identity and a unique cell identity are transmitted, <u>the network storing a neighbour cell set, the neighbour cell set comprising known neighbours of a first communications cell,</u> the method comprising:
11b	communicating with a mobile terminal operating in a first communications <u>cell;</u>
<u>11c</u>	<u>subsequent to receiving the non-unique cell identity of a second communications cell to the radio base station that serves the first communications cell,</u> requesting (111) the mobile terminal to <u>also</u> retrieve the unique cell identity of a <u>the</u> second communications cell <u>if the second communications cell is not included in the neighbour cell set of the first communications;</u>
11d	receiving (119) the unique cell identity of the second communications cell from the mobile terminal; and
11e	establishing a transport connection by finding in a lookup map a mapping of the unique cell identity of the second communications cell with a network address of the radio base station that serves the second communications cell.
	Claim 12
12a	A method as claimed in claim 11,
12b	wherein the step of requesting the unique cell identity is preceded by the step of: receiving (107) from the mobile terminal a <u>the</u> non-unique cell identity of the second communications cell.
	Claim 16
16a	A method as claimed in any one of claims 11 to 15 as performed by a radio base station.
	Claim 17
17a	A wireless telecommunications network which defines a plurality of communications cells in <u>each of</u> which a non-unique cell identity and a unique cell identity are transmitted, <u>the network storing a neighbour cell set, the neighbour cell set comprising known neighbours of a first communications cell,</u> the network comprising network resources operable to:
17b	communicate with a mobile terminal operating in a first communications cell;

17c	<u>subsequent to receiving the non-unique cell identity of a second communications cell to the radio base station that serves the first communications cell,</u> request (111) the mobile terminal to <u>also</u> retrieve the unique cell identity of a second communications cell <u>if the second communications cell is not included in the neighbour cell set of the first communications cell;</u>
17d	receive (119) from the mobile terminal a unique cell identity of the second communications cell;
17e	establish a transport connection by finding in a lookup map a mapping of the unique cell identity of the second communications cell with a network address of the radio base station that serves the second communications cell.
	Claim 22
22a	A network as claimed in any one of claim 17 to 21,
22b	wherein the network resources are provided by a radio base station (2).