

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

ERICSSON INC.,  
Petitioner

v.

KONINKLIJKE KPN N.V.,  
Patent Owner

---

Case No. IPR2023-00582  
Patent No. 8,660,560

---

**DECLARATION OF DR. MARK P. MAHON**

## TABLE OF CONTENTS

|       |                                                                                                                                                                                       |    |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| I.    | INTRODUCTION .....                                                                                                                                                                    | 1  |
| II.   | BACKGROUND AND QUALIFICATIONS .....                                                                                                                                                   | 1  |
|       | A. Overview .....                                                                                                                                                                     | 2  |
|       | B. Experience with cellular networks .....                                                                                                                                            | 6  |
| III.  | MATERIALS REVIEWED .....                                                                                                                                                              | 8  |
| IV.   | LEGAL STANDARD .....                                                                                                                                                                  | 9  |
| V.    | LEVEL OF ORDINARY SKILL .....                                                                                                                                                         | 12 |
| VI.   | TECHNICAL BACKGROUND .....                                                                                                                                                            | 15 |
|       | A. Cellular Technology .....                                                                                                                                                          | 16 |
|       | B. Handovers in Cellular Networks .....                                                                                                                                               | 17 |
|       | C. Neighbor Cell Lists .....                                                                                                                                                          | 20 |
|       | D. Neighbor Relations Lists .....                                                                                                                                                     | 21 |
| VII.  | OVERVIEW OF THE '560 PATENT .....                                                                                                                                                     | 23 |
| VIII. | CLAIM CONSTRUCTION .....                                                                                                                                                              | 25 |
|       | A. Claim 1: “updating means configured for updating at least one<br>of the first neighbour cell list and the second neighbour cell list<br>using the received cell information” ..... | 26 |
|       | B. Claim 6: “location information from one or more of the<br>detected user terminals” .....                                                                                           | 28 |
| IX.   | THE PRIOR ART TEACHES THE RECITED FEATURES OF THE<br>CHALLENGED CLAIMS .....                                                                                                          | 29 |
|       | A. <i>Amirijoo</i> .....                                                                                                                                                              | 29 |
|       | B. <i>3GPP TR 32.816</i> .....                                                                                                                                                        | 32 |

Declaration of Mark Mahon  
in Support of Petition for *Inter Partes* Review  
Patent No. 8,660,560

|    |                                                                                                            |    |
|----|------------------------------------------------------------------------------------------------------------|----|
| C. | Motivation to Combine and Expectation of Success .....                                                     | 33 |
| D. | Claims 1, 6, 7, and 8 Are Obvious in Light of <i>Amirijoo</i><br>Combined with <i>3GPP TR 32.816</i> ..... | 36 |
| 1. | Claim 1 .....                                                                                              | 36 |
| 2. | Claim 6 .....                                                                                              | 58 |
| 3. | Claim 7 .....                                                                                              | 61 |
| 4. | Claim 8 .....                                                                                              | 64 |
| X. | CONCLUSION.....                                                                                            | 65 |

Declaration of Mark Mahon  
in Support of Petition for *Inter Partes* Review  
Patent No. 8,660,560

I, Dr. Mark Mahon, declare as follows:

**I. INTRODUCTION**

[001] I have been retained by Ericsson Inc. ( “Ericsson” or “Petitioner”) as an independent expert consultant in this proceeding before the United States Patent and Trademark Office (“PTO”) regarding U.S. Patent No. 8,660,560 (the ’560 Patent) (Ex. 1001).<sup>1</sup> I have been asked to consider whether certain references disclose or suggest the limitations recited in claims 1 and 6–8 of the ’560 Patent (“the Challenged Claims”). My opinions are set forth below.

[002] I am being compensated at a rate of \$500/hour for my work in this proceeding. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other interest in this proceeding.

**II. BACKGROUND AND QUALIFICATIONS**

[003] My complete qualifications and professional experience are described in my *Curriculum Vitae*, a copy of which can be found in Exhibit 1003.

[004] The following is a brief summary of my relevant qualifications and professional experience.

---

<sup>1</sup> Where appropriate, I refer to exhibits that I understand are to be attached to the petition for *Inter Partes* Review of the ’560 patent.

**A. Overview**

[005] I am a Teaching Professor in the School of Electrical Engineering and Computer Science at Pennsylvania State University, University Park, PA (“Penn State” or “PSU”). I have worked on telecommunications networks, including AMPS, IS-95, CDMA2000, GSM, EDGE, UMTS/WCDMA, LTE, and 5G cellular systems since 1988.

[006] I received my B.S. in Electronics Engineering from the University of Scranton in 1987. I received my M.S. in Electrical Engineering and Ph.D. in Acoustics from Penn State in 1991 and 2001, respectively.

[007] In 1988, after I received my bachelor’s degree, I joined the Central Intelligence Agency (CIA) while pursuing my M.S. degree at Penn State part-time. My first job at the CIA involved designing and testing systems to automatically capture and characterize telecommunication signals and emissions from various computer networking devices.

[008] I returned to Penn State in early 1990 to pursue graduate research full-time and complete my M.S. degree. My graduate research work focused on wideband beamforming and adaptive signal processing. After completing my M.S. degree in EE in 1991, I accepted a full-time faculty research position at the Applied Research Lab at PSU, primarily working on classified programs, and began working on diverse radio frequency and acoustic sensor systems including wireless

communications and small wireless networks for acoustic tracking, source localization, and feature extraction.

[009] I began pursuing my Ph.D. part-time in 1993 while continuing my faculty research position. In 1997, as part of my faculty research position, I began working on classified programs focused on mathematical analytical modeling of cellular communication networks and the development of hardware and software systems to test against cellular networks. My role was to develop the algorithms and write the code running on a specially developed embedded system. For this work, I received a letter of recognition as the “genius behind the VELA software algorithms” from the Director of National Reconnaissance Office (NRO) Systems Engineering and Technology Office. As part of this same work, I was extensively involved in protocol and signaling analysis as well as researching model-specific performance and unique functional characteristics associated with individual mobile devices. The work involved testing dozens of handsets from many manufacturers in controlled and real-world environments against network simulators and live operational networks for each research project.

[010] In 2000 my research extended into utilizing non-orthogonal wavelets for improving detection and localization of cellular handsets from high altitude sensor systems. In 2001, I completed my Ph.D. and my research focused on the

Declaration of Mark Mahon  
in Support of Petition for *Inter Partes* Review  
Patent No. 8,660,560

utilization of advanced communication signals for wideband characterization and remote sensing of propagation channels.

[011] Beginning in 1997 my cellular communications research work focused on CDMA, GSM, EDGE, UMTS, LTE, and 5G cellular systems primarily under grants sponsored principally by the Department of Defense. This classified research work required 3GPP protocol analysis and development of real-time embedded hardware and software systems capable of interacting with cellular networks and cellular handsets. A large portion of my work was directed at architectures, protocols, software, and signaling.

[012] I have been working on classified projects since 1988. Before 1998, because the work was not deemed highly classified, I was able to publish eight journal and conference papers prior to 2000. Between 1999 and 2015, however, I was allowed to publish only one article in an unclassified symposium and published and presented about a dozen articles in classified settings. This is because during this period, the vast majority of my research was highly classified. As a result, nearly all of my research results were summarized in classified reports and not available to the general public. Further, because the U.S. government owns any intellectual property resulting from the sponsored research work, I did not pursue or file patent applications.

Declaration of Mark Mahon  
in Support of Petition for *Inter Partes* Review  
Patent No. 8,660,560

[013] In 2015, I transferred to the School of Electrical Engineering and Computer Science at Penn State as a teaching faculty member. In that role, I have continued teaching graduate and undergraduate courses, guiding Ph.D. and M.S. students in communication and mobile networking (including LTE and 5G cellular networks), and pursuing research in this and related areas. Since 2015, I have been an author on six refereed papers as listed in my curriculum vitae (CV) (attached as Exhibit A).

[014] Because of my decades of research and my continuing work at Penn State, I have intimate knowledge of telecommunication networks, including the technology involved in the patents in this case. I have been highly recognized as an expert in such systems within the research community. I was recognized twice by the National Reconnaissance Office with commendation letters for work dealing with detecting cellular signals in low signal to noise ratio environments. The U.S. government awarded me over \$12M in grants between 2003 and 2015 for projects focused on mobile communication devices and networks, in which I served as a Principal Investigator (PI), Co- PI, and/or technical lead.

[015] Additionally, during my research career, I interacted extensively with computer scientists and engineers responsible for the design, development, and testing of telephony and data networking systems and testbeds. As a research faculty member, I oversaw engineers and computer scientists that executed many joint

projects with development organizations. These interactions exposed me to a wide range of computer scientists and engineers working on telecommunication network technologies. Since 2011, I have been teaching undergraduate and graduate classes in communication and mobile networking and am familiar with the curricula being taught to electrical engineers and computer scientists. The interactions with a wide range of computer scientists and engineers working on telecommunication network technologies and the familiarity with the classes taught to electrical engineers and computer scientists have allowed me to have a good understanding of the level of skills possessed by a person of ordinary skill in the field of cellular technology.

**B. Experience with cellular networks**

[016] I have extensive experience with mobile networks in general and LTE and 5G specifically. While most of my research efforts between 1998 and 2015 are highly classified, I can state that they included detailed investigation of network architectures, signaling, and functional behavior. A typical research effort would involve studying 3GPP, 3GPP2, IEEE, and other protocol standards to fully comprehend all aspects of L1, L2, and L3 requirements including timing, bit-level construction of the control and user plane messages, and timing characteristics for a given standard as well as functional behavior of network components and user equipment.

[017] From 2006 through 2015 my research focused specifically on LTE.

My research continues to this day, although I am no longer operating in a classified environment. During this time, I investigated the performance and functional differences of many varied network and handset devices to see how differing signaling and environmental factors influenced the behavior of user equipment in a given network environment. This included how synchronization, timing, and signal to interference plus noise ratio (SINR) for a given device would affect specific functional aspects including elements of the receiver structure, decoding and demodulation performance, calculation of parameters used by the device for making decisions and deriving parameters reported to the network.

[018] As part of my research work, I built several custom CDMA, GSM, UMTS, and LTE platforms that implemented specific network-side and user equipment-side functionality including custom signal generation and processing structures, particularly the signal processing chains on both the transmit and receive sides. This equipment was developed using network simulation hardware in a laboratory environment and was later tested with corresponding networks in both controlled and fully operational environments. Implementing the transmit and receive chains for custom built protocol-enabled equipment required me to gain an intimate understanding of the relevant 3GPP protocol specifications and the underlying structures. Since 2015, I have been primarily focused on guiding

Declaration of Mark Mahon  
in Support of Petition for *Inter Partes* Review  
Patent No. 8,660,560

graduate students pursuing research into multiple-input multiple-output (MIMO) techniques to improve throughput in dense-user environments, optimized distributed processing algorithms, and the implementation of block chain coding techniques to improve handover security in 4G (LTE)/5G (NR) networks.

### III. MATERIALS REVIEWED

[019] The opinions contained in this Declaration are based on the documents I reviewed, my professional judgment, as well as my education, experience, and knowledge regarding cellular networking systems.

[020] In forming my opinions expressed in this declaration, I reviewed:

| Ex. #    | Reference                                                                                                          |
|----------|--------------------------------------------------------------------------------------------------------------------|
| Ex. 1001 | U.S. Patent No. 8,660,560                                                                                          |
| Ex. 1004 | Prosecution History of U.S. Patent No. 8,660,560                                                                   |
| Ex. 1005 | U.S. Patent Publication No. 2009/0191862 (“ <i>Amirijoo</i> ”)                                                     |
| Ex. 1006 | WO 2009/075620 A1 (“ <i>Engström</i> ”)                                                                            |
| Ex. 1007 | 3GPP TR 32.816 v1.0.0 (“ <i>3GPP TR 32.816</i> ”)                                                                  |
| Ex. 1008 | Ericsson, “Discussion on Automatic Neighbour Relation Lists for LTE,” TSG-SA5 Meeting #53 (May 2007) (“S5-070974”) |
| Ex. 1009 | 3GPP TS 36.300 v8.7.0 (“ <i>3GPP TS 36.300</i> ”)                                                                  |
| Ex. 1010 | Cover Pleading to KPN’s Infringement Contentions in Case No. 2:22-cv-282                                           |
| Ex. 1011 | KPN’s Infringement Contentions for U.S. Patent No. 8,660,560 in Case No. 2:22-cv-282                               |
| Ex. 1012 | Declaration of Craig Bishop                                                                                        |

#### IV. LEGAL STANDARD

[021] I am not an attorney and offer no legal opinions. My analysis and opinions are based on my expertise in this technical field and on the instructions that counsel has given me for the legal standards relating to patentability as outlined in the rest of this section. I have applied these principles in reaching the opinions set forth herein.

[022] I understand and the standard that I have used throughout my declaration is that, in this proceeding, a patent claim may be deemed unpatentable as “anticipated” if it is shown by a preponderance of the evidence that each and every feature of the claim is found in a single prior art reference or rendered “obvious” if, in view of a prior art reference or a combination of prior art references, it would have been obvious to a person of ordinary skill in the art (“POSITA”) at the time of the invention, taking into account the following four issues: (1) the scope and intent of the prior art, (2) the differences between the prior art and the claim under consideration, (3) the level of ordinary skill in the art, and (4) any secondary evidence bearing on obviousness.

[023] Counsel has informed me that legal principles regarding unpatentability of a claim due to obviousness have been addressed by the U.S. Supreme Court and that, while not absolute, the principles relating to a “motivation,” “suggestion,” or “teaching” in the prior art to combine references are useful in

Declaration of Mark Mahon  
in Support of Petition for *Inter Partes* Review  
Patent No. 8,660,560

analyzing whether an invention is obvious. Counsel has also informed me that the suggestion or motivation may be either explicit or implicit and may come from knowledge generally available to a POSITA, from the nature of the problem to be solved, or from a combination of these factors. The test for an implicit motivation, suggestion, or teaching is what the combined teachings, knowledge of a POSITA, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. The analysis is not focused on the specific problem solved by the invention, but the general problem that confronted the inventor prior to the invention.

[024] Counsel has further informed me that the U.S. Supreme Court has clarified that additional principles may also be applied in such an analysis. Some of those principles are set forth below.

[025] I have been informed by counsel that it is no longer always required to present evidence of an explicit teaching, suggestion, or motivation to combine prior art references for purposes of determining whether an invention is obvious. Prior art can be combined based on several factors including: an express teaching, suggestion, or motivation from the prior art itself, or from a reasoned explanation of an expert or other witness.

[026] I have been informed that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was

independently known in the prior art. In evaluating whether such a claim would have been obvious, I may consider whether there is a reason that would have prompted a person of ordinary skill in the field to combine the elements or concepts from the prior art in the same way as in the claimed invention.

[027] To determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to interrelated teachings of multiple pieces of prior art, to the effects of demands known to the design community or present in the marketplace, and to the background knowledge possessed by a POSITA. Also, in determining obviousness, one must be aware of the distortion caused by hindsight bias and be cautious of arguments relying upon hindsight reasoning. An obviousness argument cannot be sustained by mere conclusory statements. Instead, it must be some articulated reasoning with some rational underpinnings to support the legal conclusion of obviousness.

[028] In an obviousness analysis, it is my understanding that there are “secondary considerations” that should be analyzed if they apply. I am told that these considerations include (a) whether the prior art teaches away from the claimed invention, (b) whether there was a long felt but unresolved need for the claimed invention, (c) whether others tried but failed to make the claimed invention, (d) skepticism of experts, (e) whether the claimed invention was commercially

successful, (f) whether the claimed invention was praised by others, and (g) whether the claimed invention was copied by others.

[029] I have also been informed that in order for evidence of secondary considerations to be significant, there must be a sufficient relationship between the claimed invention and the evidence of secondary considerations. I understand that this relationship serves to provide a link between the merits of the claimed invention and the evidence of secondary considerations provided.

[030] I have been informed by counsel that the Board construes claims according to the so-called “Phillips” standard. Under the Phillips standard, terms in a claim are given their ordinary and customary meaning, consistent with the patent’s specification, as understood by a POSITA. I have been informed by counsel that what is to be considered includes the claims, the patent specifications and drawings, and the prosecution history, including any art listed by the examiner or the Applicant. I have been informed by counsel that information external to the patent, including expert and inventor testimony and unlisted prior art, are to be considered if ambiguities remain. However, expert testimony may be useful in helping to explain the technology.

## **V. LEVEL OF ORDINARY SKILL**

[031] It is my understanding that a person of ordinary skill in the art (“POSITA”) is a hypothetical person who is used to analyze the prior art without the

Declaration of Mark Mahon  
in Support of Petition for *Inter Partes* Review  
Patent No. 8,660,560

benefit of hindsight. I have been instructed that the level of ordinary skill may be reflected by the prior art of record, and that a person of ordinary skill in the art to which the claimed subject matter pertains would have the capability of understanding the scientific and engineering principles applicable to the pertinent art. I have been instructed that there are multiple factors that may be considered in determining the level of ordinary skill in the art may include: 1) type of problems encountered in the prior art; 2) prior art solutions to those problems; 3) rapidity with which innovations are made; 4) sophistication of the technology; and 5) educational level of active workers in the field. I also understand that a POSITA is also a person of ordinary creativity, not an automaton. They would be able to fit the teachings of multiple patents together like a puzzle and have the capability of understanding the scientific and engineering principles applicable to the pertinent art.

[032] I have been asked to provide a definition for the level of ordinary skill in the art in the field of the '560 Patent at the time the priority application for the '560 Patent was filed. As stated in the '560 Patent, “[t]he invention relates to the field of telecommunications systems and a method in telecommunications architecture.” Ex. 1001, 1:20–21. More particularly, the '560 Patent relates “to a telecommunications architecture comprising at least a first and a second wireless access network between which user terminals can be transferred and a method in such a telecommunications system, wherein the neighbour cell lists (NCLs) of at

least a wireless access node of the first and/or second wireless access network can be updated using a system.” Ex. 1001, 1:22–28.

[033] In my opinion, a POSITA as of the claimed priority date of the ’560 Patent would have had (1) the equivalent of an undergraduate degree in Electrical Engineering or a related field; and (2) at least three years of experience in design, development, and/or testing of telecommunication systems. In a similar vein, a POSITA would also have familiarity with the wireless standards and protocols related to data transmission and network management. It is also my opinion that more education could supplement practical experience or *vice versa*.

[034] I understand that a POSITA is presumed to be one who thinks along the lines of conventional wisdom in the art and is not one who undertakes to innovate, whether by extraordinary insights or by patient and often expensive systematic research. A POSITA is not the judge, nor a layperson, nor one skilled in remote arts, nor a genius in the art, nor the inventor.

[035] I understand that a POSITA is presumed to have knowledge of all references that are sufficiently related to one another and to the pertinent art and to have knowledge of all arts reasonably pertinent to the particular problem that the claimed invention addresses.

[036] I have been asked to consider the time of the alleged invention to be on or around October 7, 2009, which corresponds to the filing date of European

Declaration of Mark Mahon  
in Support of Petition for *Inter Partes* Review  
Patent No. 8,660,560

Patent Application No. EP09172399. In addition, I understand that Patent Owner contends that that Challenged Claims “are entitled to a priority date of no later than August 7, 2008.” Ex. 1010, 3. My opinions would not change if the Challenged Claims are entitled to the earlier priority date asserted by Patent Owner.

[037] All of my opinions in this declaration are from the perspective of a POSITA, as I have defined it above and during the relevant time frame, *i.e.*, on or around October 7, 2009. During this time frame, I possessed at least the qualifications of a person of ordinary skill in the art, as defined above, and I am capable of addressing the issues from the perspective of such a person. My opinions in this declaration reflect how a POSITA would have understood the claims and the specification of the '560 Patent, the prior art to the patent, and the state of the art on or around October 7, 2009.

[038] As I discuss in detail below, it is my opinion that certain prior art references disclose or suggest all the limitations recited in the Challenged Claims of the '560 Patent.

## **VI. TECHNICAL BACKGROUND**

[039] In this section, I will discuss pertinent concepts and techniques that were known to a POSITA prior to the '560 Patent.

**A. Cellular Technology**

[040] Mobile communications were originally developed for military purposes. The idea transitioned to the commercial world primarily through the development of cellular communication systems which were deployed beginning in the early 1980s. In mobile cellular telecommunications systems, user equipment (often abbreviated “UE”) transmit signals to and receive signals from a network of base stations. Over the past 40 years, mobile communication technologies have advanced tremendously with significant new developments appearing approximately every 10 years. To distinguish among the significant evolutions that have occurred over time, mobile communication technologies are generally divided into generations via industry consensus and is typically associated with a new air interface and network architecture. The first generation (1G) analog transmission technology emerged in the 1980s, followed by second generation (2G) digital systems in the early 1990s, which were followed by third generation (3G) networks and fourth generation (4G) systems, culminating with the most recent fifth-generation (5G) of cellular technology, which is also called new radio or “NR.”

[041] In 1998, the Third-Generation Partnership Project (3GPP) was formed as a consortium of several national and regional standardization organizations, manufacturers, operators, and market organizations. Since its formation, 3GPP has prepared the technical specifications for 3G Wideband Code Division Multiple

Access or “WCDMA,” 4G Long Term Evolution or “LTE,” and 5G NR. The prior art references discussed in this declaration generally relate to the development of automatic neighbor relations (ANR) technology for 4G LTE. *See generally* Ex. 1005, Title (“INTER-RAT/FREQUENCY AUTOMATIC NEIGHBOR RELATION LIST MANAGEMENT”); Ex. 1007, Title (“Study on Management of LTE and SAE (Release 8)”).

## **B. Handovers in Cellular Networks**

[042] All cellular telecommunication systems implement some type of mobility management. When a mobile moves from one part of a network towards or into another, it needs to stop communicating with one cell and begin communicating with the next cell. This is accomplished through two different mechanisms, “handover” for mobiles that are in an active voice and/or data connection and “cell reselection” for mobiles that are in a standby mode. When handover occurs, the mobile’s connection is handed over from the cell to which it is currently connected (serving base station) to another cell’s coverage area that is controlled by a different candidate or target base station.

[043] Performing handovers is fundamental to the functionality and execution of a cellular network. The main objective of performing a handover is to keep the voice or data connection active while making the procedure imperceptible (seamless) to the user. This ‘seamless’ handover occurs most of the time and, based

on my experience, most users don't realize when handovers occur between cellular base stations.

[044] The handover procedure associated with each generation varies in lower-level details, however there are high-level aspects that are applicable to 2G, 3G, 4G, and 5G cellular networks. While the lower-level details vary, they all use similar concepts that were established in 2G networks beginning in the early 1990s with the basic principle of two main phases: handover preparation and handover execution.

[045] In order for a handoff to be successful, multiple events need to occur before (preparation phase) the actual changeover of the connection is made (execution phase) between the source and target base station as outlined in the steps below:

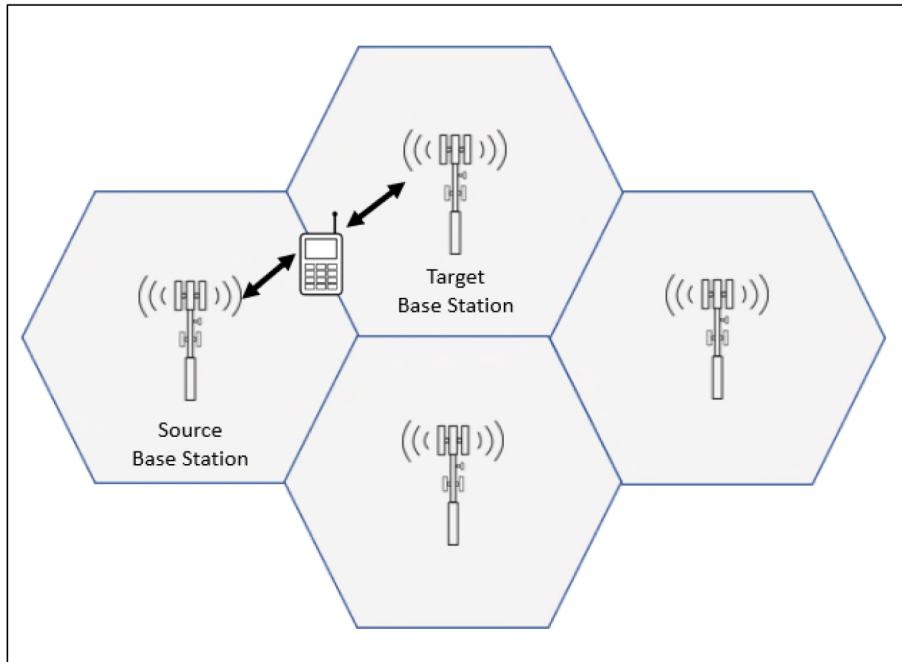
a) The mobile terminal monitors the received signal strength of neighbor cells.

As the mobile terminal is moving away from the serving base station, the signal from one or more of these neighbor cells will begin to get stronger and the signal being received from the serving cell will begin to get weaker due to the changing propagation characteristics and distance between the mobile terminal, serving base station, and neighbor cells.

b) The network typically requests the mobile terminal to send a measurement report with the current signal strength measurements from neighbor cells.

- c) The network determines that a handoff is required.
- d) The network determines the target cell for the handover based on the received measurement report and other network criteria, *e.g.*, the current network capacity and channel availability at the target cell, the capabilities of the mobile terminal, etc.
- e) The network sends a handover command to the mobile via the serving base station. This signaling message contains all the information that the mobile will need to start communicating with the target base station.
- f) After receiving the handover command message, the mobile terminal attempts to communicate with the target base station.
- i) After successfully communicating with the target base station, the mobile terminal sends a handover complete signaling message to the network.
- j) When the network receives the handover complete message from the mobile, it instructs the serving base station to disconnect the channel that was assigned to the mobile terminal. At this point, the serving base station can use this released channel for a new connection with another mobile terminal and the handover is complete.

[046] A simplified version of handover depicting a mobile device moving between cells, represented by the hexagons, from a serving base station to a target base station is shown below.



[047] This figure depicts a simple network where each base station serves a single cell. In practice, a single base station may serve multiple cells (sectors). As a result, handover can occur between cells of the same base station as well as between cells of different base stations.

### C. Neighbor Cell Lists

[048] Each cell in a cellular network maintains one or more lists of surrounding cells that are potential handover targets. These lists are conventionally known as a “neighbor cell lists.” *See, e.g.,* Ex. 1006, 2:1–5 (“An important concept in such a system is the cell and its neighbours. During a call a mobile terminal typically moves around among the cells; moving from one to one of its neighbours, repeatedly. A list of known neighbours, the so-called ‘neighbour cell list’ is

important for the network to enable reliable handover between cells of a mobile terminal.”).

[049] In 2G and 3G networks, the purpose of the neighbor cell list is to provide connected mobile terminals with a defined set of neighbor cells to evaluate for potential handover. Ex. 1006, 2:5–7. Accordingly, the neighbor cell list is broadcast from the serving base station to connected mobile terminals. Ex. 1006, 2:9–10. After receiving the neighbor cell list, the mobile terminal measures the operating parameters of each neighbor cell on the neighbor cell list and reports the measurement results back to the network. Ex. 1006, 2:10–13. When the signal quality of a neighbor cell is considered better than the current serving cell for the mobile terminal, the network may trigger a handover. Ex. 1006, 2:13–17. As a result, once the connection is handed over, the neighbor cell (*i.e.*, the handover target) becomes the serving cell.

#### **D. Neighbor Relations Lists**

[050] With the development of 4G, neighbor cell lists were no longer needed since the system design leveraged the UE to detect neighbors and report them to the network based on thresholding operations. Although conventional neighbor cell lists were unnecessary, there remained a need for each base station to maintain a defined list of neighboring cells for the purpose of managing eNobeB to eNodeB connections over the X2 interface (*i.e.*, the peer-to-peer interface between base stations in a 4G

network). Ex. 1006, 2:19–27; Ex. 1008, 1–2, 5. In view of the changing role that such lists would have in 4G cellular standards, engineers from Ericsson proposed using the term “neighbor relation list” (NRL) in 4G technical specifications:

**3GPP TSG-SA5 (Telecom Management)**  
**Meeting SA5#53, 07 - 11 May 2007, Sophia Antipolis, FRANCE**

**S5-070974**

---

|               |                                                          |
|---------------|----------------------------------------------------------|
| Source:       | Ericsson                                                 |
| Title:        | Discussion on Automatic Neighbour Relation Lists for LTE |
| Document for: | Discussion and approval                                  |
| Agenda Item:  | 6.8.4                                                    |

---

. . .

### 3 Rationale

The manual planning and management of Neighbour Cell Lists in a Radio Access Network, such as GSM and WCDMA, is resource consuming and error prone. In [1], section 4.1.3, Use Case 2, it is suggested that the LTE standardizes functions for optimizing Neighbour Cell Lists. This contribution takes that idea step further and argues that neighbour Cell Lists should be automated.

One purpose of Neighbour Cell Lists in GSM and WCDMA is to allow the RBS to give their connected UEs a defined set of cells to measure. The need for the list to be short is that when GSM and WCDMA were standardized, it was not feasible to have the UE measure on all possible neighbours. For LTE, the situation is different. It is assumed that a LTE UE can decode any measurement cell identity on a frequency. For this reason, Neighbour Cell Lists as we know them from GSM or WCDMA will not be needed in LTE.

Neighbour Cell Lists will exist in LTE, though, but have a different role. In contrast to GSM and WCDMA, one purpose of Neighbour Cell Lists is to set up connections over the X2 interface between eNodeBs. This role is the reason for this contribution. As the role of the list has changed, we give it a new name: Neighbour Relation List.

Ex. 1008, 1.

[051] The neighbor relation list includes the measurement cell identities (MCI) and cell global identifiers (CGIs) of neighboring cells that are potential handover targets. Ex. 1005, [0014] (“The neighbor relation list (NRL), thus constitutes or is at least involved in the mapping from the local ID [*i.e.*, the MCI] to

the Cell Global Identity (CGI) and possibly also other information such as the IP address of the target base station (BS).”); *see also* Ex. 1008, 4; Ex. 1006, 11:1–9. The MCI is a local identity that is typically associated with multiple cells within the network. By contrast, the CGI is a unique identity for the neighboring cell. In operation, the neighbor relation list is updated through a process by which the base station instructs a mobile terminal to report the MCIs for neighbor cells measured by the mobile terminal. If the mobile terminal reports one or more MCIs that are not on the neighbor relation list, the serving base station instructs the mobile terminal to listen to the broadcast channel of the unknown neighbor cell and report back the CGI, which is used to lookup the transport layer address (*e.g.*, IP address) of the neighbor. The newly discovery neighbor is then added to the serving base station’s neighbor relation list. *See generally* Ex. 1006, 2:29–3:29, 7:25–9:29; Ex. 1008, 4; Ex. 1009, 114–117.

## **VII. OVERVIEW OF THE ’560 PATENT**

[052] The ’560 Patent relates to system for updating the neighbor cell list (NCL) of a wireless access node, such as a base station, in a telecommunications architecture that includes multiple wireless access networks. Ex. 1001, 1:20–28. Figure 2 (reproduced below) illustrates the components of the system contemplated by the ’560 Patent.

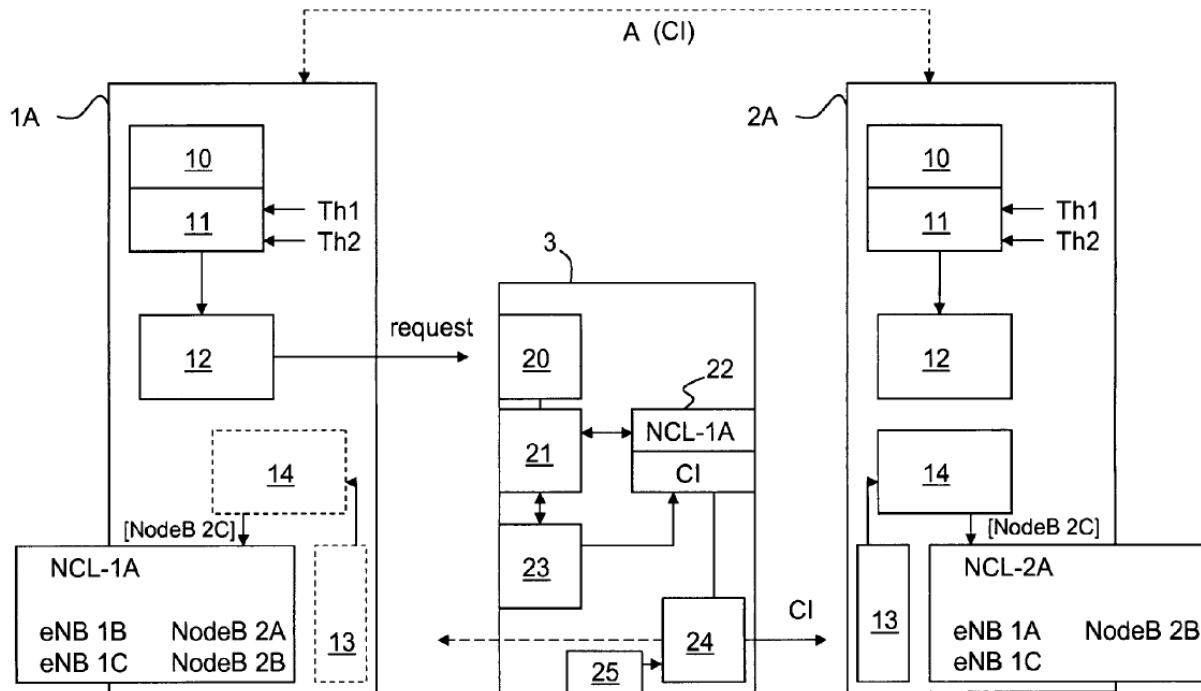


**FIG. 2**

Ex. 1001, Figure 2.

[053] As shown above, Figure 2 depicts two base stations (1A and 2A) and a mobile device (3). Base station 1A includes “a cell reselection/handover detector 10 that recognizes that mobile terminal 3 requires a cell reselection or handover to NodeB 2A.” Ex. 1001, 7:31–34. Base station 1A also includes “selection module 11 for selecting a part of the user terminals 3 for which a cell reselection or handover indication is detected,” which is used “to filter an appropriate portion the user terminals for which cell reselection or handover is about in order to reduce unnecessary signalling.” Ex. 1001, 7:41–48. The ’560 Patent suggests that “[a]n

advantageous selection criterion at the side of the eNB 1A for determining which user terminals 3 should report cell information is the transfer threshold” represented by “Th1” and/or “Th2” in Figure 2. Ex. 1001, 7:65–8:11. Following the selection module (11), Base station 1A includes a “request generator 12” that “obtain[s] cell information of the second wireless access network when user terminal is about to be handed over to this network.” Ex. 1001, 9:35–38. Once responsive cell information (*e.g.*, the global cell identifiers of a neighboring cell) is received via “receiver 13,” the ’560 Patent states that “Updater 14 may be used to update NCL-1A by adding wireless access node NodeB 2C, as illustrated.” Ex. 1001, 9:52–59.

## **VIII. CLAIM CONSTRUCTION**

[054] I understand that claim terms are typically given their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art, at the time of the alleged invention, which I was asked to assume to be on or around October 7, 2009.

[055] I have reviewed the language of the claims in light of the specification and prosecution history of the ’560 Patent and have applied the ordinary and customary meaning of the terms in my analysis. In my opinion, the prior art discloses all possible reasonable constructions of these terms.

[056] In addition, I was asked to provide my opinion regarding the proper interpretation of certain terms for which Petitioner seeks an express construction. Each of these terms is discussed below.

**A. Claim 1: “updating means configured for updating at least one of the first neighbour cell list and the second neighbour cell list using the received cell information”**

[057] Claim 1 of the '560 Patent is directed to a system that includes an “updating means configured for updating at least one of the first neighbour cell list and the second neighbour cell list using the received cell information.” Ex. 1001, Claim 1. I was asked whether an “updating means” is a name for structure known to persons of ordinary skill in the art. In my opinion, the claimed “updating means” is not a name for such a structure. Instead, as reflected in the '560 Patent’s specification and the claims themselves, the “updating means” is defined solely by its function: “updating at least one of the first neighbour cell list and the second neighbour cell list using the received cell information.”

[058] Although I am not a lawyer, I understand that so-called “means-plus-function” terms, such as the “updating means” of the '560 Patent, are limited to the structure disclosed in the specification for performing the claimed function. For purposes of my analysis, I assumed that the structure corresponding to the claimed “updating means” is the “updater 14” discussed at 9:26–28 and 9:58–59 of the '560 Patent and depicted in Figure 2 (reproduced below).

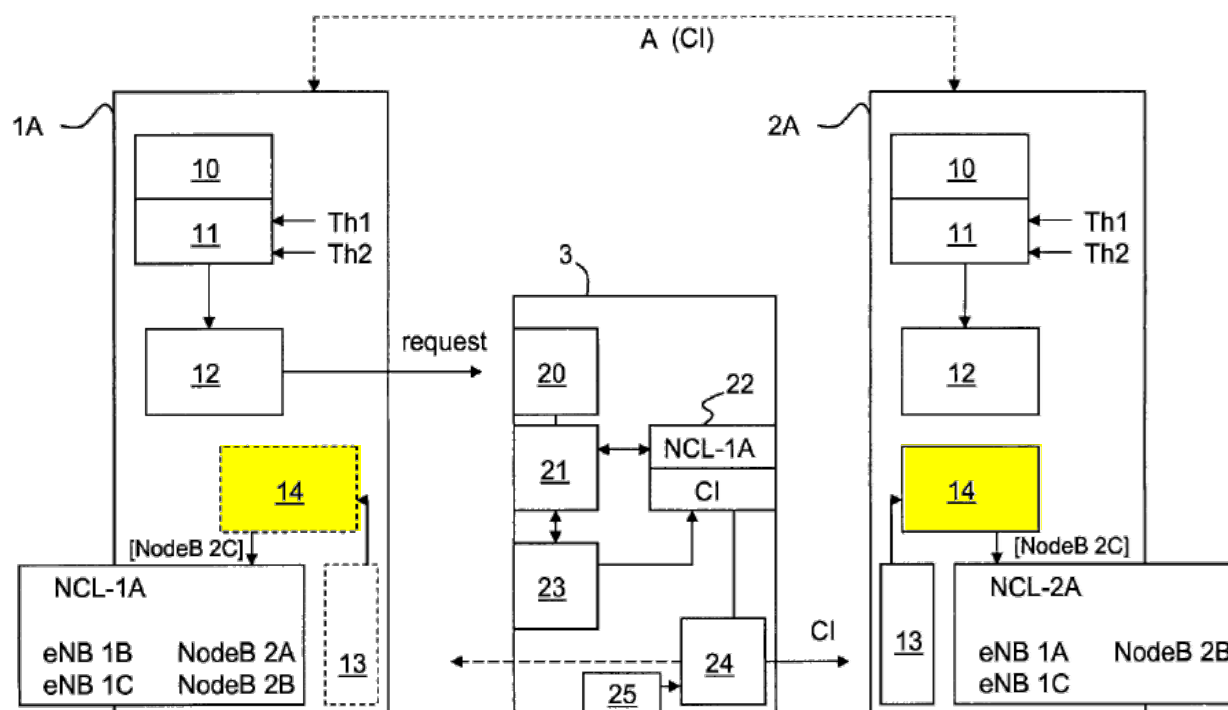


**FIG. 2**

Ex. 1001, Fig. 2 (annotations added). As reflected in Figure 2, the disclosed structure for the “updating means” is a box labeled “14,” which is connected to “receiver 13.”

Ex. 1001, 9:26–28. After a base station (e.g., “1A” and/or “2A”) receives cell information (abbreviated “CI” in the figure) for an unknown neighbor via “receiver 13,” the ’560 Patent states that “updater 14 may be used to update” the base station’s NCL (e.g., “NCL-1A” and/or “NCL-2A”) by “adding” the received cell information to the list. *See* Ex. 1001, 9:58–59 (“Updater 14 may be used to update NCL-1A by adding wireless access node NodeB 2C, as illustrated [in figure 2].”). I have considered this structure and equivalents thereof in rendering my opinions regarding

the prior art (discussed below). In my opinion, a POSITA would understand the claimed “updating means” as a means-plus-function term with the following construction:

| Term                                                                                                                                                                    | Construction                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| “updating means configured for updating at least one of the first neighbour cell list and the second neighbour cell list using the received cell information” (Claim 1) | <p>This is a means-plus-function term.</p> <p><b>Function:</b> updating at least one of the first neighbour cell list and the second neighbour cell list using the received cell information.</p> <p><b>Structure:</b> “updater 14” disclosed in the ’560 Patent and equivalents thereof. <i>See</i> Ex. 1001, Fig. 2, 9:26–28, 9:58–59.</p> |

**B. Claim 6: “location information from one or more of the detected user terminals”**

[059] I have reviewed Patent Owner’s infringement contentions in Case No. 2:22-cv-282 for Claim 6 of the ’560 Patent. Ex. 1011, 7–8. In its contentions, Patent Owner argues that Ericsson’s base stations are “configured for receiving location information from one or more of the detected user terminals” because “each Accused Product is configured by Ericsson to obtain information regarding at least the cell in which the terminal is operating, such cell corresponding to a particular geographic coverage area.” Ex. 1011, 7–8. For purposes of my analysis, I assumed that Patent Owner’s interpretation is correct. Consistent with Patent’s Owner’s infringement

contentions, the claimed “location information” is broad enough to include information regarding the cell in which a terminal is operating.

## **IX. THE PRIOR ART TEACHES THE RECITED FEATURES OF THE CHALLENGED CLAIMS**

[060] It is my opinion that Claims 1, 6, 7, and 8 of the ’560 Patent are obvious based on *Amirijoo* (defined below) combined with *3GPP TR 32.816*.

### **A. *Amirijoo***

[061] I understand that the patent application filed on December 10, 2008 and published on July 30, 2009 as US Patent Publication No. 2009/0191862A1 (“*Amirijoo*”) qualifies as prior art to the ’560 Patent.

[062] *Amirijoo* is directed to “apparatus, methods, and techniques for establishing and managing inter-RAT [*i.e.*, inter-radio access technology] measurements and information, such as that utilized by a neighbor relation list for inter-RAT/frequency mobility.” Ex. 1005, [0026], [0115]. In this context, a POSITA would understand that “inter-RAT/frequency mobility” is another term for handover between cells that use a different radio access technology and/or a different frequency for wireless communications. Ex. 1005, [0015] (“To provide seamless mobility it is necessary to Hand Over (HO) mobile stations (MSs) in E-UTRAN to an alternative Radio Access Technology (RAT) such as GSM EDGE Radio Access

Network (GERAN) or UTRAN with better coverage. . . . Handover between two different RATs is referred to as an inter-RAT (IRAT) handover.”).

[063] *Amirijoo* explains that “[p]reviously in 2G (e.g., GERAN) and 3G (e.g., UTRAN) systems NRL lists have been populated using planning tools by means of coverage predictions before the installation of a base station (BS).” Ex. 1005, [0024]. Basing neighbor lists on coverage predictions was undesirable because “[p]rediction errors, due to inaccuracies in topography data and wave propagation models, have forced the operators to resort to drive/walk tests to completely exhaust the coverage region and identify all handover regions and as such the neighbors.” Ex. 1005, [0024]. Thus, *Amirijoo* teaches that “it is essential to make use of automatic in-service approaches for generating and updating NRLs.” Ex. 1005, [0024].

[064] To reduce operators’ reliance on conventional planning tools used to populate and manage neighbor lists, *Amirijoo* discloses “apparatus, methods, and techniques for automatically managing relationships to neighbors in other RATS/frequencies, for example neighbor relation lists (NRLs) in E-UTRAN containing GERAN and UTRAN neighbors.” Ex. 1005, [0027]. As noted in *Amirijoo*, “E-UTRAN” refers to a 4G LTE network, while “GERAN” and “UTRAN” refer to 2G GSM and 3G WCDMA networks, respectively. Ex. 1005, [0008]–[0009], [0015].

[065] *Amirijoo*'s system comprises a serving base station that uses a first radio access technology and/or frequency (abbreviated "RAT/frequency" in *Amirijoo*) and a candidate base station that uses a second radio access technology and/or frequency. Ex. 1005, [0032]; *see also* Ex. 1005, Figs. 1, 3, and 4 (illustrating different aspects of *Amirijoo*'s system). *Amirijoo* teaches that the serving base station is configured to detect mobile devices to be transferred to a neighboring cell of the candidate base station and to use the measurement reports from such mobile devices to update its neighbor relation list. Ex. 1005, Fig. 3, [0050], [0077], [0082]. In a similar vein, *Amirijoo* teaches that the serving base station may inform a management node in the core network (which *Amirijoo* refers to as the "NRL handler") about the newly detected neighbor relationship. Ex. 1005, [0082]; *see also* Ex. 1005, [0066] ("The core network 16 can comprise, or otherwise have access to, neighbor relation list (NRL) handler 18."). Once it receives such information, the NRL handler informs the candidate base station of the new relationship, thus enabling the candidate base station to update its NRL by adding an entry corresponding to the serving base station. Ex. 1005, [0082]. As a result, *Amirijoo* teaches that both the serving and candidate base stations involved in inter-RAT frequency handover are able to update their NRLs accordingly.

[066] Like the Challenged Claims of the '560 Patent, *Amirijoo*'s system includes a selector configured to select a part of the mobile terminals ("certain

mobile stations”) based on “triggering conditions.” *See* Ex. 1005, [0079] (disclosing that “[i]nter-RAT/frequency measurements from *certain mobile stations chosen using the triggering condition(s)* described in Section 2.0 are used to detect new inter-RAT/frequency neighbors”) (emphasis added). As discussed in greater detail below, *Amrijoo*’s triggering conditions are “rules and thresholds” that “may be evaluated at the base station (BS) or the mobile station (MS)” to determine if and when to initiate the inter-RAT/frequency measurements used to identify new neighbors. Ex. 1005, [0079], [0083]–[0089].

**B. 3GPP TR 32.816**

[067] I understand that *3GPP TR 32.816* qualifies as prior art to the ’560 Patent because it was publicly available at least as early as May 23, 2007, when it was uploaded to 3GPP’s file server. Ex. 1012, ¶¶50–57.

[068] *3GPP TR 32.816* is a 3GPP technical report (TR) that describes various improvements to network management that were investigated during the development of the 4G standard. Ex. 1007, 6. This included, for instance, “neighbor cell list optimization.” Ex. 1007, 11 (describing “[o]ptimisation of neighbour cell list of self-configuration instance” as an “[o]bjective” for network management in 4G wireless standards).

[069] *3GPP TR 32.816* teaches that “[b]ased on the assumed initial neighbour set further optimisation of neighbour list (including 2G/3G) is needed

considering e.g. radio measurements of eNodeBs and UEs or call events like call drops, handover problems etc.” Ex. 1007, 11. For example, *3GPP TR 32.816* teaches that “RRC connections (calls, signalling procedures) and their accompanying measurements can be used to gather the needed information about neighbours.” Ex. 1007, 11. This enables the network to detect and add new neighbors to a neighbor cell list “based on information in UEs about detected cells” and to check if neighbors on the neighbor cell list “are really appropriate concerning real RF conditions.” Ex. 1007, 11. Furthermore, *3GPP TR 32.816* teaches that an algorithm optimizes the neighbor cell list based on one or more pieces of input information, including “Location of the neighbours (distance),” “UE measurement reporting or eNodeB radio scanning for neighbours,” “Field strength information,” and “Event measurements like cell specific call drops or handover failures.” Ex. 1007, 11; *see also* Ex. 1007, 13–14 (teaching that “all measurements can be linked with correct location information” to optimize handover parameters like the “HO neighbour list”).

**C. Motivation to Combine and Expectation of Success**

[070] *Amirijoo* directly cites to *3GPP TR 32.816*. Ex. 1005, [0016]. Accordingly, a POSITA would have been motivated to combine *Amirijoo* with the teachings of *3GPP TR 32.816*. Indeed, the purpose of such citations is to guide the reader (*e.g.*, a POSITA reviewing *Amirijoo*) to additional sources of relevant

information. In my opinion, a POSITA would be motivated to supplement *Amirijoo* with the teachings of any reference expressly cited by *Amirijoo*, including *3GPP TR 32.816*.

[071] A POSITA would have recognized that *Amirijoo* and *3GPP TR 32.816* are both directed to ensuring that wireless networks are simple to deploy and cost efficient through the use of self-optimizing and self-configuring technologies. Ex. 1005, [0024]–[0026]; Ex. 1007, 4. Further, *Amirijoo* discloses that 4G networks will initially rely upon existing 2G and 3G networks. See Ex. 1005, [0015]. Thus, a POSITA would have recognized that backwards compatibility with earlier generations of cellular technology would be crucial to the commercial success of *Amirijoo*’s system. As a result, a POSITA would have been motivated to combine the conventional neighbor cell lists used in 2G and 3G networks, as taught by *3GPP TR 32.816*, with the system taught by *Amirijoo*. This modification would have involved a simple combination of one known element with another to obtain predictable results: a system configured to update neighbor cell lists (e.g., as taught in *3GPP TR 32.816*) according to the “techniques for automatically managing relationships to neighbors in other RATS/frequencies” disclosed in *Amirijoo*. Ex. 1005, [0027]–[0030]; Ex. 1007, 11–12.

[072] In addition to the motivation to combine *Amirijoo* and *3GPP TR 32.816* outlined above, a POSITA would have had a reasonable expectation of

success in combining these references. Again, the fact that *Amirijoo* expressly cites *3GPP TR 32.816* shows that the authors of *Amirijoo* believed that a POSITA would be able to combine the teachings of these references with a reasonable expectation of success. Ex. 1005, [0016]. In my opinion, this is compelling evidence that a POSITA would have considered in assessing the expectation of success. Moreover, a POSITA would have known that the pertinent disclosure in 3GPP TR 32.816 (the neighbor cell list) was successfully implemented in existing 2G and 3G cellular networks. See Ex. 1007, 11 (suggesting that “a *further* optimisation of neighbour list (*including 2G/3G*) can be done”) (emphasis added); Ex. 1008, 1 (noting that “[t]he manual planning and management of Neighbour Cell Lists in a Radio Access Network, *such as GSM and WCDMA*, is resource consuming and error prone”) (emphasis added); Ex. 1006, 2:9–10 (explaining that, “[i]n existing system[s] like *GSM or W-CDMA*, the neighbour cell list is broadcasted from the base station to the mobile terminal”) (emphasis added). Given that neighbor cell lists were successfully implemented in existing systems supporting multiple generations of wireless technology, a POSITA would anticipate success in supplementing *Amirijoo*’s system with such lists.

**D. Claims 1, 6, 7, and 8 Are Obvious in Light of *Amirijoo* Combined with 3GPP TR 32.816**

**1. Claim 1**

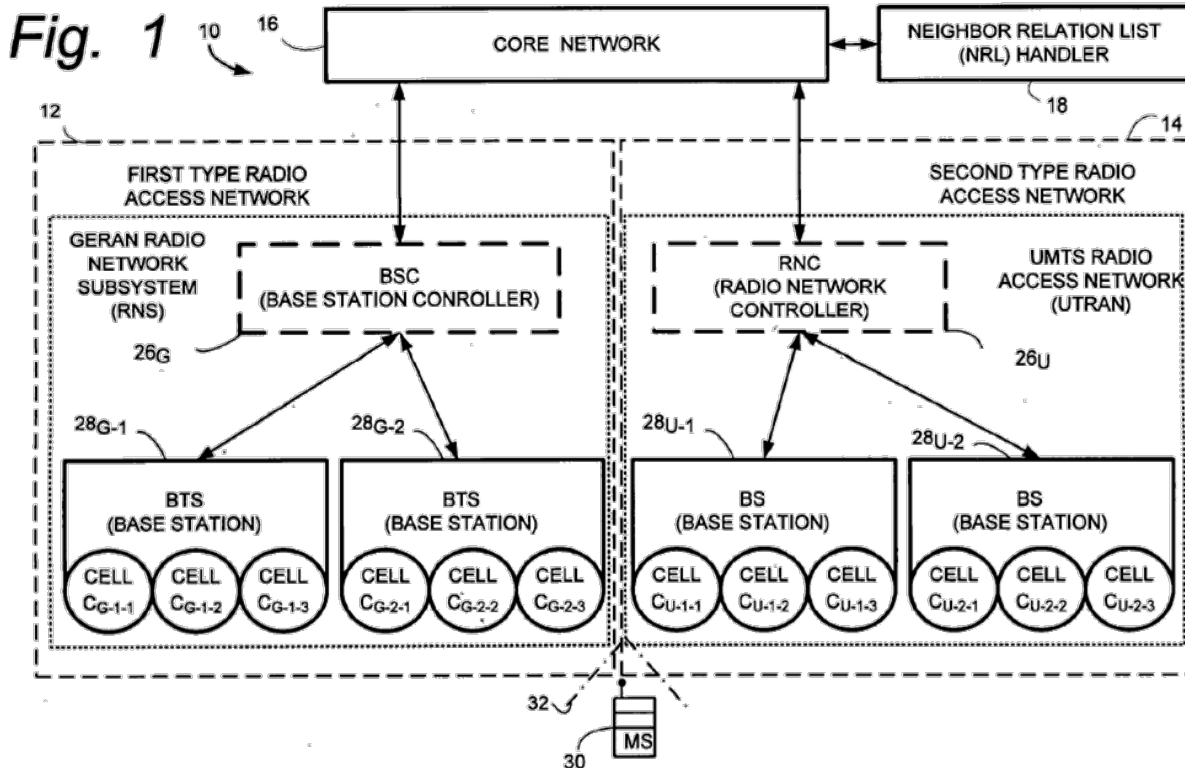
- a) [1pre] A system for updating a neighbour cell list in a telecom communications architecture comprising a first wireless access network having a first wireless access node for which at least one first neighbour cell list is defined and a second wireless access network having a second wireless access node for which at least one second neighbour cell list is defined, the system comprising

[073] To the extent the preamble of Claim 1 is limiting, the combination of *Amirijoo* and 3GPP TR 32.816 (hereafter, *Amirijoo-3GPP TR 32.816*) discloses the preamble.

[074] Specifically, *Amirijoo* teaches “apparatus, methods, and techniques for automatically managing relationships to neighbors in other RATS/frequencies, for example neighbor relation lists (NRLs) in E-UTRAN containing GERAN and UTRAN neighbors.” Ex. 1005, [0027]. “E-UTRAN” is an acronym for the Evolved Universal Terrestrial Radio Access Network used in 4G LTE standards. Ex. 1005, [0009]. By contrast, the GSM EDGE Radio Access Network (“GERAN”) and “UTRAN” neighbors referenced in *Amirijoo* are 2G and 3G radio access technologies, respectively. Ex. 1005, [0015].

[075] As shown in Figure 1 below, *Amirijoo* teaches “a telecommunications system operating in conjunction with both a first radio access network having a first

type radio access technology and a second radio access network having a second type radio access technology.” Ex. 1005, [0048], [0066].



Ex. 1005, Fig 1; *see also* Ex. 1005, [0066] (“FIG. 1 shows an example telecommunications system 10 operating in conjunction with both a first radio access network 12 and a second radio access network 14.”)

[076] In the above figure, the “first type radio access network” includes multiple base stations, and each base station serves multiple cells. Specifically, the first base station (28<sub>G-1</sub>) serves cells C<sub>G-1-1</sub>, C<sub>G-1-2</sub>, and C<sub>G-1-3</sub>, while the second base station (28<sub>G-2</sub>) serves cells C<sub>G-2-1</sub>, C<sub>G-2-2</sub>, and C<sub>G-2-3</sub>. The “second type radio access network” also includes multiple base stations (28<sub>U-1</sub> and 28<sub>U-2</sub>) and cells (C<sub>U-1-1</sub> to C<sub>U-</sub>

2-3). A skilled artisan would know that the number of cells depicted in Figure 1 is merely for illustrative purposes. *See* Ex. 1005, [0069] (noting that “for sake of simplicity each base station 28 is shown as serving three cells”). Regardless of the number of cells served by each base station (*e.g.*, 1, 3, 10, etc.), the base stations of the first and second wireless networks are first and second wireless access nodes, which communicate with mobile devices over the air interface. Ex. 1005, [0070].

[077] As depicted in Figure 1, one of the base stations of one of the radio access networks is the serving base station for a mobile device (30), while one of the base stations in the other radio access network is a candidate base station to which the mobile device may be transferred. Ex. 1005, [0070] (“[F]or example, cell  $C_{G-2-3}$  of first radio access network 12 may be the serving base station for mobile station (MS) 30, but in view of proximity and/or reception cell  $C_{U-1-1}$  may be a candidate base station. The converse could also occur.”). As mobile devices move throughout the network, every cell in *Amirijoo’s* network will be the serving cell for connected mobile devices and the candidate cell for mobile devices moving into the cell’s coverage area. As a result, every cell maintains a NRL that includes the Cell Global Identity (CGI) of potential handover targets (*i.e.*, other cells in the neighborhood) and “possibly also other information such as the IP address of the target base station (BS).” Ex. 1005, [0013]–[0015]; *see also* Ex. 1005, [0082] (disclosing that “the candidate base station (BS) can be added to the neighbor relation list (NRL) of the

serving base station (BS)” and the candidate base station also “adds an entry corresponding to the serving base station (BS) in its NRL”). *Amirijoo*’s system is configured to automatically update the NRLs based on inter-RAT/frequency measurements received from mobiles. Ex. 1005 [0027]–[0031], [0079]–[0082], [0115]–[0118].

[078] Therefore, it is my opinion that *Amirijoo* discloses a system for updating an NRL in a telecommunications architecture comprising a first wireless access network (*e.g.*, an LTE network) having a first wireless access node (*e.g.*, the serving cell of a base station in the LTE network) for which at least one first neighbor relation list is defined and a second wireless access network (*e.g.*, a 2G or 3G network) having a second wireless access node (*e.g.*, a candidate cell of a base station in the 2G or 3G network) for which at least one second neighbor relation list is defined.

[079] While the ’560 Patent is directed to a system for updating “neighbour cell lists” and *Amirijoo* is directed to a system for updating NRLs, it would have been obvious to a POSITA to combine conventional neighbor cell lists disclosed in other prior art, such as *3GPP TR 32.816*, with *Amirijoo*’s system. Ex. 1007, 11 (teaching a need for “[n]eighbour cell list optimization”). As noted above, Ericsson’s delegates to 3GPP came up with NRLs during the development of LTE because of the fact that “[n]eighbour [c]ell [l]ists *as we know them from GSM or*

*WCDMA* will not be needed in LTE.” Ex. 1008, 1 (emphasis added). However, *Amirijoo* contemplates handover between different radio access technologies (e.g., LTE to WCDMA/GSM or *vice versa*). Ex. 1005, [0015], [0027], [0115]. Because *Amirijoo*’s system interoperates with pre-existing GSM and WCDMA networks, it would be obvious to a POSITA to incorporate the pre-existing neighbor cell lists from GSM and WCDMA into the system taught by *Amirijoo*. See Section IX(C).

[080] *Amirijoo* envisioned backward compatibility with 2G and 3G networks, explaining that “E-UTRAN [*i.e.*, LTE] will initially have limited radio coverage,” which necessitates the ability to “Hand Over (HO) mobile stations (MSs) in E-UTRAN to an alternative Radio Access Technology (RAT) such as GSM EDGE Radio Access Network (GERAN) or UTRAN with better coverage.” Ex. 1005, [0015]. In situations where backward compatibility is imperative, POSITAs are well aware of the benefits of reusing pre-existing cellular technology, such as neighbor cell lists. Indeed, several of these well-known benefits are outlined in *3GPP TR 32.816*.

The LTE and SAE systems need to be managed. As LTE and SAE are evolvments of UMTS, the management should also evolve from UMTS.

A reuse of the existing UMTS management standard solutions will have the following benefits:

- It is proven in operation;
- It will minimise both the standardisation and product development efforts (i.e. the cost and time);
- It provides a base for on which more functionality can be developed (compared with making everything new from the start);
- It will shorten the time to market for LTE and SAE systems;
- It will facilitate a seamless coexistence with UMTS management systems.

Declaration of Mark Mahon  
in Support of Petition for *Inter Partes* Review  
Patent No. 8,660,560

Ex. 1007, 4; *see also* Ex. 1007, 6 (“The present document intends to study the reuse of UMTS management for LTE and SAE to decide on which parts shall be reused without any change, which parts shall be changed and which existing parts cannot be reused at all and make recommendations about that.”).<sup>2</sup> In my opinion, the “benefits” outlined above are good reasons for a POSITA to combine the neighbor cell lists disclosed in *3GPP TR 32.816* with *Amirijoo*.

[081] Thus, to ensure compatibility with handovers between 2G, 3G, and 4G networks, a POSITA would make the obvious connection to incorporate the conventional neighbor cell lists from 2G and 3G networks into *Amirijoo*’s system for “automatically managing relationships to neighbors in other RATs/frequencies.” Ex. 1005, [0027]; Ex. 1007, 11 (teaching that a “further optimisation of neighbour list (including 2G/3G) is needed” and that “RRC connections (calls, signalling procedures) and their accompanying measurements can be used to gather the needed information about neighbours”). This connection is especially obvious in this case because a reference teaching neighbor cell lists (*3GPP TR 32.816*) is expressly cited

---

<sup>2</sup> The “Universal Mobile Telecommunications System (UMTS) is a third generation mobile communication system, which evolved from the Global System for Mobile Communications (GSM), and is intended to provide improved mobile communication services based on Wideband Code Division Multiple Access (WCDMA) access technology.” Ex. 1005, [0008]. “UTRAN” is a related term that refers to the 3G WCDMA radio access network.

in *Amirijoo*. Ex. 1005, [0016] (explaining that “[t]he vision [in 4G standardization] is that the new system shall be self-optimizing and self-configuring in as many aspects as possible” and citing *3GPP TR 32.816*).

[082] For the reasons outlined above, a POSITA would be motivated to combine neighbor cell lists, as disclosed in *3GPP TR 32.816*, with *Amirijoo*. Accordingly, *Amirijoo-3GPP TR 32.816* teaches a system for updating a neighbor cell list comprising a first wireless access network having a first wireless access node for which at least one first neighbor cell list is defined and a second wireless access network having a second wireless access node for which at least one second neighbor cell list is defined.

- b) **[1a] a detector configured for detecting user terminals to be transferred from the first wireless access node of the first wireless access network to the second wireless access node of the second wireless access network;**

[083] *Amirijoo-3GPP TR 32.816* discloses and renders obvious element [1a]. Figure 3 (reproduced below) is a block diagram of the serving base station, candidate base station, and mobile device in *Amirijoo*’s network. Ex. 1005, [0050].

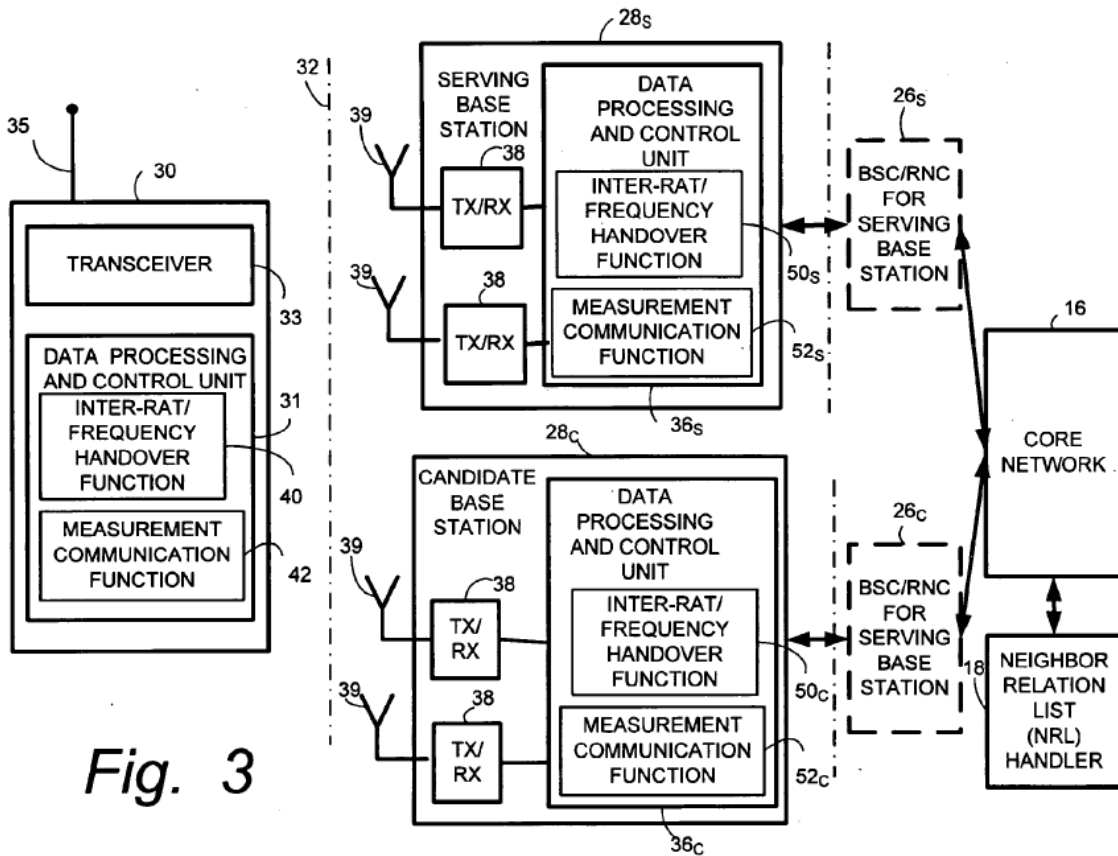


Fig. 3

Ex. 1005, Fig 3.

[084] Specifically, Figure 3 depicts a serving base station (28<sub>s</sub>) that is connected to one or more mobiles (30) “involved in an example inter-RAT/frequency handover” to a candidate base station (28<sub>c</sub>). Ex. 1005, [0050], [0074]. *Amirijoo* uses the terms “candidate base station” and “target base station” interchangeably to refer to the base station to which the mobile device will be transferred. See Ex. 1005, [0013] (“As an example, consider the case of a prepared handover (HO) in E-UTRAN. The target or candidate base station (BS), which the

*mobile station (MS) will be handed off to*, gives guidance for the mobile station (MS) on how to make the radio access . . .”) (emphasis added).

[085] *Amirijoo* teaches that “the serving base station (BS) needs to be able to trigger inter-RAT/frequency measurements, make a comparison between different RATs/frequencies, and make a HO decision.” Ex. 1005, [0017]–[0020]. To accomplish this, *Amirijoo* explains that the serving base station’s “data processing and control unit” (labeled 36s) “comprise[s] inter-RAT/frequency handover function 50 and measurement communication function 52.” Ex. 1005, [0077]. *Amirijoo* further teaches that “the measurement communication function 52 controls communications with mobile station (MS) 30 for requesting or obtaining measurements or information (e.g., measurements or information for potential handover purposes),” while the “inter-RAT/frequency handover function 50 is invoked when it is determined that a handover is to occur.” Ex. 1005, [0077]. A POSITA would have understood that the data processing and control unit taught by *Amirijoo* discloses a detector configured to detect user terminals to be transferred from the first wireless access node to the second wireless access node.

**c) [1b] a selector configured for selecting a part of the user terminals;**

[086] *Amirijoo-3GPP TR 32.816* discloses and renders obvious element [1b]. It teaches that “Inter-RAT/frequency measurements from certain mobile

*stations chosen using the triggering condition(s) described in Section 2.0 are used to detect new inter-RAT/frequency neighbors, as illustrated in FIG. 4, act (1).” Ex. 1005, [0079] (emphasis added).*

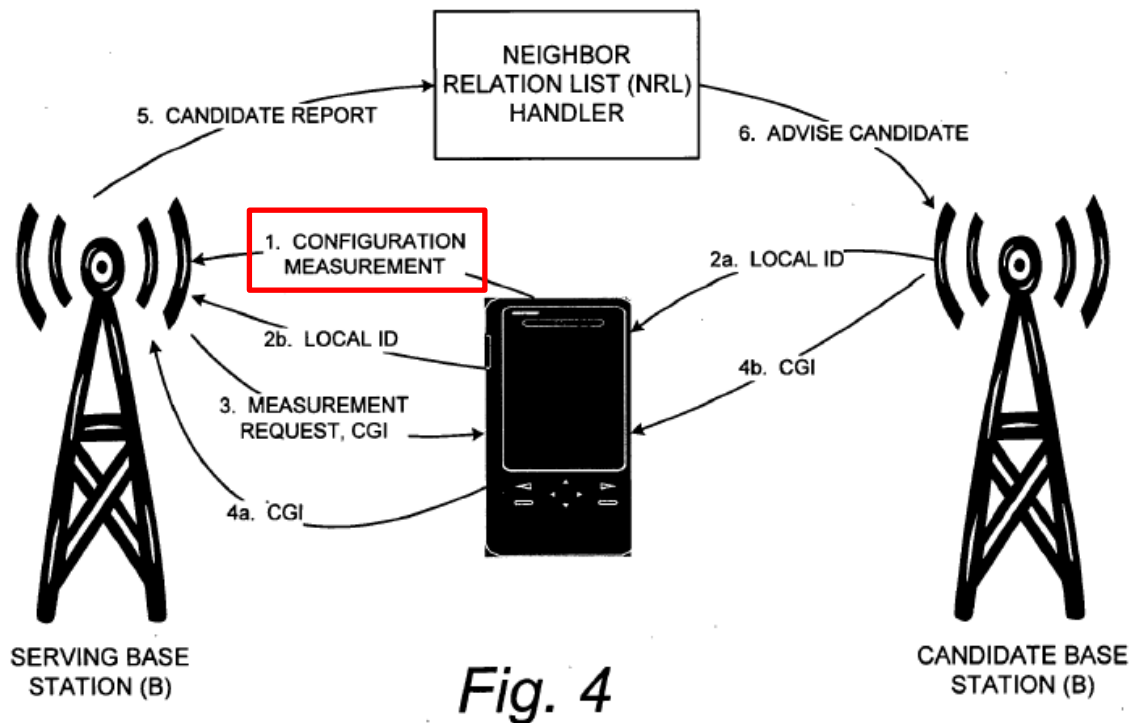


*Fig. 4*

Ex. 1005, Fig 4 (annotations added).

[087] *Amirijoo* discloses multiple embodiments of the “triggering conditions” used to choose “certain mobile stations.” Ex. 1005, [0079]. In a first embodiment, “the base station (BS) receives measurements from the mobile station (MS) and evaluates the triggering conditions.” Ex. 1005, [0079]. In the second, alternative embodiment, “the base station (BS) informs the mobile station (MS) regarding the triggering conditions and the mobile station (MS) evaluates the conditions and starts inter-RAT/frequency measurements once they are triggered.”

Ex. 1005, [0079]. Both embodiments disclose a selector that is configured to select one or more mobile terminals (*i.e.*, part of the mobile terminals) to provide inter-RAT/frequency cell information that may be used to update the NRL. Ex. 1005, [0080] (“The mobile station (MS) measures the signal quality of surrounding inter-RAT/frequency base stations once the condition(s) . . . are triggered.”).

[088] *Amirijoo* discloses the following “[s]uggested criteria” for triggering “inter-RAT/frequency measurements”:

- a) Mobile stations with low data rates perform inter-RAT/frequency measurements. Retransmissions due to poor channel quality may result in a greater actual transmitted data than required by the services in the mobile station (MS). Therefore, the criterion for choosing mobile stations for measurements must be based on the actual transmitted UL and DL data rates to the mobile station (MS).
- b) Mobile stations with an estimated signal quality of the serving base station (BS) below a given threshold (see threshold C in FIG. 6) perform inter-RAT/frequency measurements.

Ex. 1005, [0083]–[0085].

[089] The first triggering criteria (*i.e.*, “a”) involves a selector configured to select mobile stations with relatively low data throughput rates to perform inter-RAT/frequency measurements. Ex. 1005, [0084]. As explained in *Amirijoo*, “[t]he impact on a service, e.g., video streaming, when performing inter-RAT/frequency measurements is smaller for mobile stations that require less number of scheduling blocks (SBs) . . . [a]s such, mobile stations with a low average number of scheduled

scheduling blocks (SBs) should perform inter-RAT/frequency measurements.” See Ex. 1005, [0086]. Thus, *Amirijoo* teaches that a subset of mobile devices with relatively low demands (*i.e.*, “mobile stations with a low average number of scheduled scheduling blocks”) are selected from the larger population of all mobile devices (including, *e.g.*, mobile devices with a high average number of scheduled scheduling block) and instructed to perform inter-RAT/frequency measurements.

[090] The second triggering criteria (*i.e.*, “b”) uses a selector configured to select mobiles whose signal quality has fallen below a predefined threshold to perform inter-RAT/frequency measurements. Ex. 1005, [0085], [0087]–[0088]. As shown in Figure 6 (reproduced below), *Amirijoo* explains that this threshold can either be equivalent to or different than the threshold for triggering inter-RAT/frequency handover measurements.

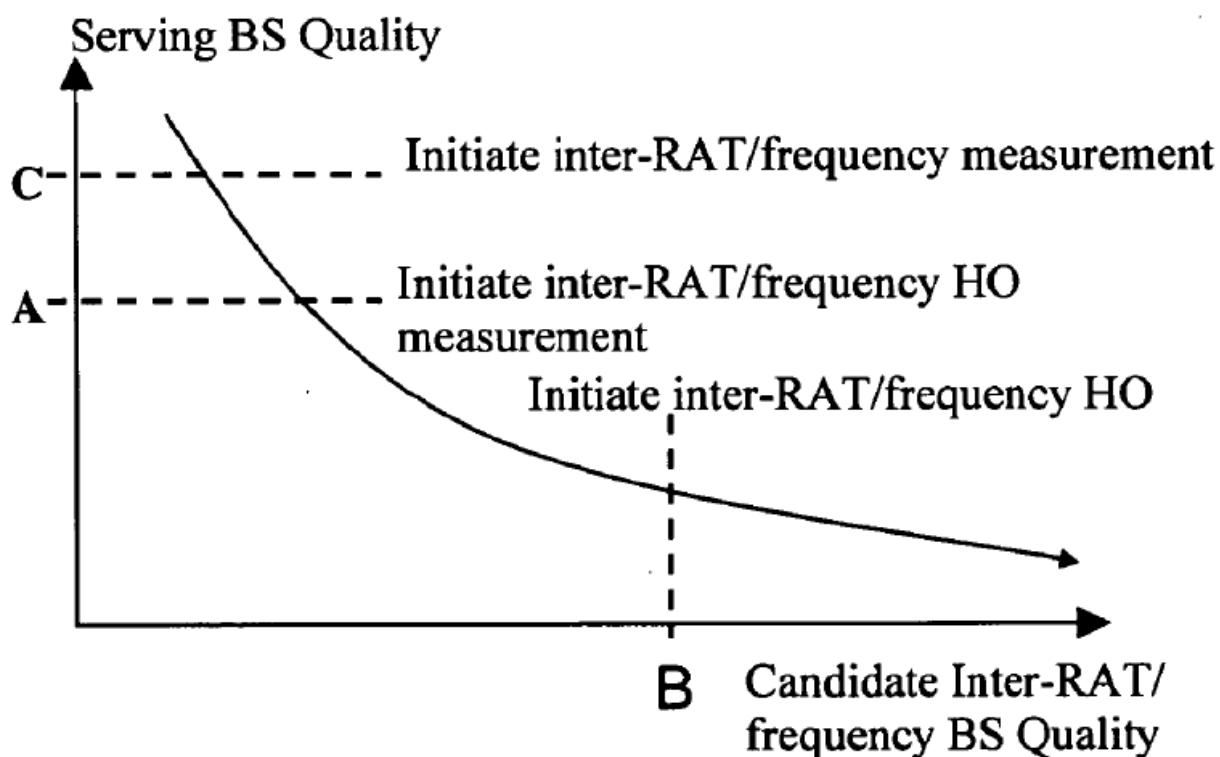


**Fig. 6**

Ex. 1005, Fig. 6; *see also* Ex. 1005, [0087] (“The threshold used in criteria b) can either be the same threshold as is used for inter-RAT/frequency handover measurements (*e.g.*, threshold A in FIG. 6), or it can be set higher than the handover threshold (*e.g.*, higher than threshold A of FIG. 6, such as threshold C in FIG. 6)) to make sure that an inter-RAT/frequency neighbor is found before the mobile station (MS) falls out of coverage.”). As a result, *Amirijoo* teaches that a subset of mobile devices with weak connections are selected from the larger population of all mobile devices (including, *e.g.*, mobile devices with strong connections) and instructed to perform inter-RAT/frequency measurements.

[091] *Amirijoo* also discloses that the predefined threshold referenced above “can depend on the service, subscription type, UE type, etc.” Ex. 1005, [0089]. As an example of a “service” threshold as a third triggering criteria, *Amirijoo* explains that “Gold Subscription users are assigned lower threshold C than ordinary subscription users to avoid bulk measurements to a larger extent.” Ex. 1005, [0089]. Thus, *Amirijoo* discloses a selector configured to select a part of the mobile terminals (in this example, “Gold Subscription users”) from the larger population of all subscribers to conduct the inter-RAT/frequency measurements used to generate and update the NRL.

[092] The various triggering criteria taught by *Amirijoo* disclose the claimed “selector configured for selecting a part of the user terminals” in the ’560 Patent. Ex. 1005, [0079], [0083]–[0089]. In summary:

- a) The first triggering criteria selects a part of the mobile terminals based on the amount of data being consumed by the mobile terminals. Ex. 1005, [0084], [0086].
- b) The second triggering criteria selects a part of the mobile terminals based on the quality of the connection between the serving base station and the mobile terminals. Ex. 1005, [0085], [0087]–[0088].
- c) The third triggering criteria selects a part of the mobile terminals based (at least in part) on the subscriber characteristics of the mobile terminals. Ex. 1005, [0089].

[093] Based on the above, a POSITA would have recognized that *Amirijoo-3GPP TR 32.816* teaches a selector configured for selecting a part of the user terminals.

- d) **[1c] a request generator configured for requesting from the first wireless access node one or more of the selected user terminals to report cell information of a plurality of wireless access nodes of at least one of the first wireless access network and the second wireless access network;**

[094] *Amirijoo-3GPP TR 32.816* discloses and renders obvious element [1c]. As reflected in Figure 3 below, *Amirijoo* teaches that the data processing and control unit (labeled 36<sub>s</sub>) of the serving base station is connected to “one or more base station transceivers (TX/RX) 38.” Ex. 1005, [0076]. The serving base station’s transmitter (*i.e.*, the “TX” component of 38) is connected to an antenna (labeled 39) and communicates over the air interface with selected mobile terminal(s) (labeled 30). Ex. 1005, [0076]. “TX” and “RX” are well-known abbreviations for transmitter and receiver, respectively.

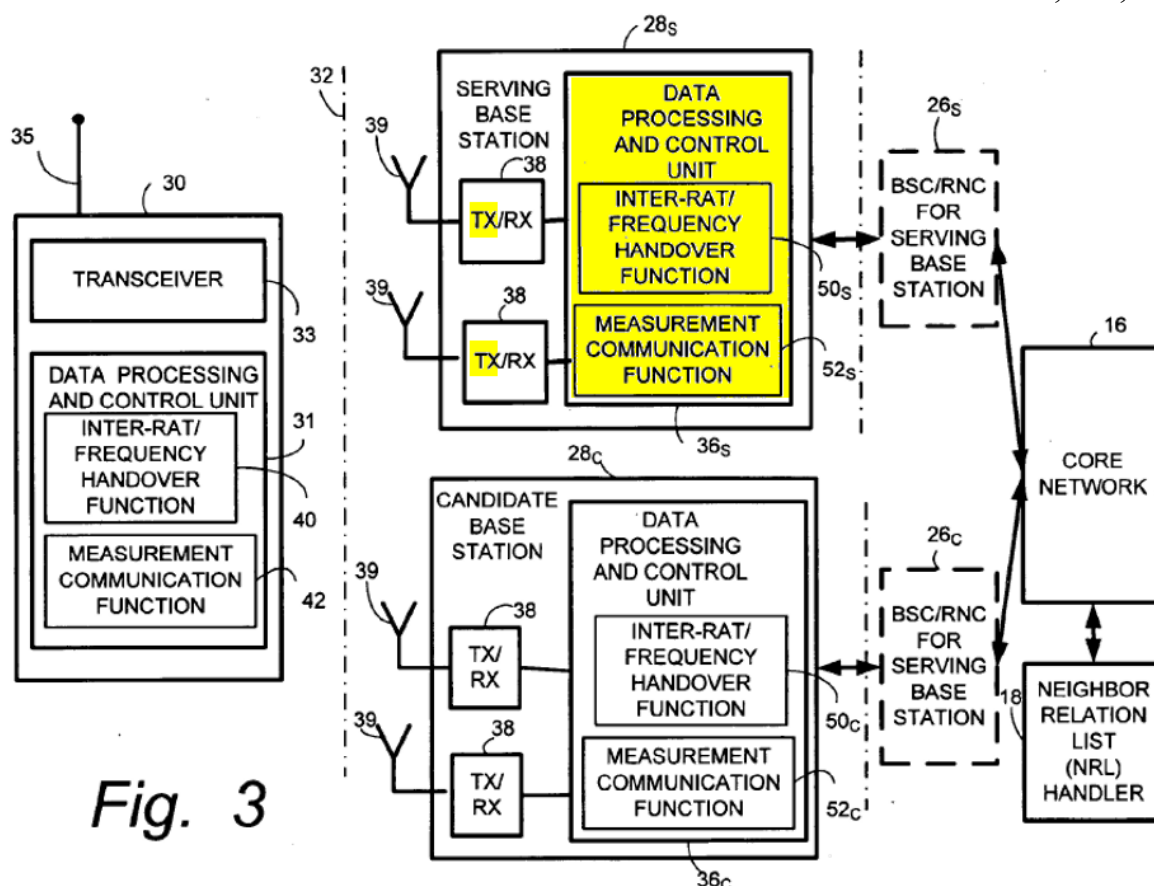


Fig. 3

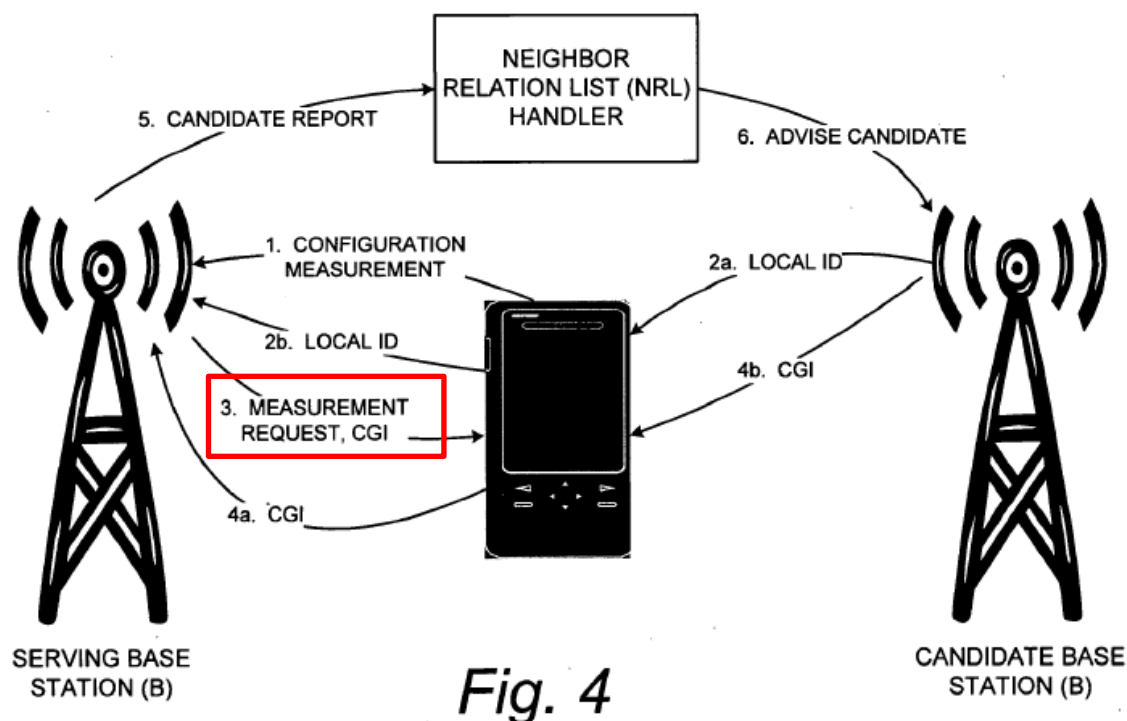
Ex. 1005, Fig 3 (annotations added).

[095] *Amirijoo* teaches that “[t]he mobile station (MS) measures the signal quality of surrounding inter-RAT/frequency base stations once the condition(s) in Section 2.0 are triggered.” Ex. 1005, [0080]. After measuring the signal quality of neighboring inter-RAT/frequency cells, the mobile terminal reports the “local ID” of each neighbor that was detected together with the results of the measurement. Ex. 1005, [0080]. *Amirijoo* discloses that “local IDs” are cell information that “can take the form, for example, of the Base Station Identity Code (BSIC) for GERAN [*i.e.*, a

2G/GSM network] or the scrambling code for UTRAN [*i.e.*, a 3G/WCDMA network].” Ex. 1005, [0080].

[096] The local IDs discussed in *Amirijoo* (which are also called measurement cell identities or MCIs) are not necessarily unique to a particular cell. Ex. 1005, [0014]; *see also* Ex. 1006, 2:29–3:1 (explaining that, in an LTE network, “[i]t is assumed that the MCI will have 510 unique values and the MCIs will be reused several times in a large network”). By contrast, as the name implies, the Cell Global Identity (CGI) is unique within the network. *See* Ex. 1005, [0014] (“The local ID is not enough for a handover (HO), since the local ID is not unique within the network. As such, when handing off a mobile station (MS) to the neighbor the CGI of the neighbor must be known.”).

[097] *Amirijoo* teaches that the serving base station is configured to request mobile terminals to report the CGI of neighbor cells that are not on the serving base station’s NRL. Ex. 1005, [0081]. For example, Figure 4 (reproduced below) shows that the serving base station transmits a “measurement request, CGI” message to the mobile terminal to request missing CGI(s).



Ex. 1005, Fig 4 (annotations added).

[098] Thus, *Amirijoo* discloses that the data processing and control unit of the serving base station is configured to request “cell information” (*i.e.*, local IDs and CGIs) from one or more of the selected mobile terminals.

- e) **[1d] a receiver configured for receiving the cell information from the one or more of the selected user terminals; and**

[099] *Amirijoo-3GPP TR 32.816* discloses and renders obvious element [1d]. As explained above in Sections IX(D)(1)(c) and IX(D)(1)(d) (which are incorporated herein by reference), *Amirijoo* teaches a selector configured to select mobile terminals and a request generator configured to request inter-RAT/frequency cell information (*e.g.*, local IDs and CGIs) from the selected mobile terminals. To

receive the requested cell information, *Amirijoo* discloses that the data processing and control unit (36<sub>s</sub>) of the serving base station is connected to “one or more base station transceivers (TX/RX) 38.” Ex. 1005, [0076]. The serving base station’s receiver(s) (*i.e.*, the “RX” component of the transceiver) are depicted in Figure 3 (reproduced below).

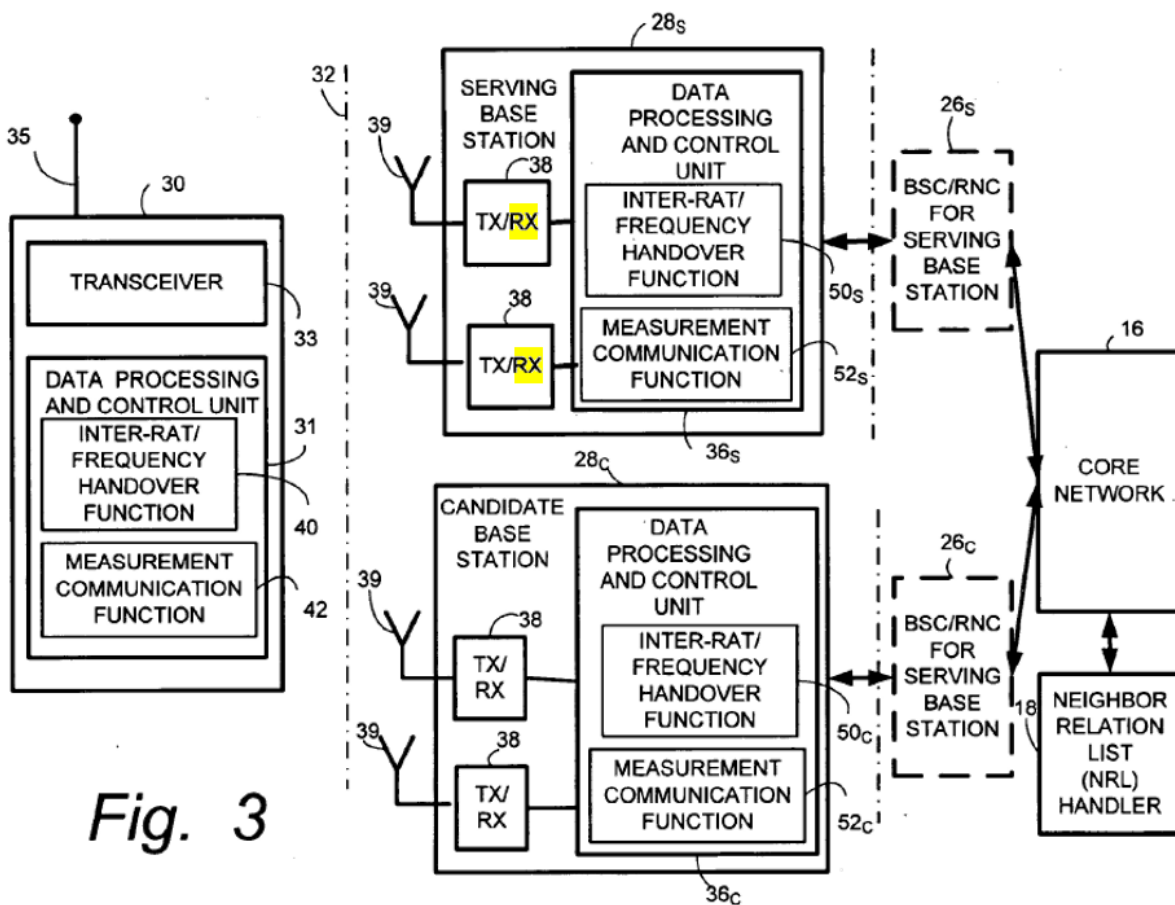


Fig. 3

Ex. 1005, Fig 3 (annotations added); *see also* Ex. 1005, [0081] (stating that “the base station measurement communication function 52 can be *configured to receive* and send *communications such as those shown in FIG. 4* and which enable or allow the

mobile station to perform acts of FIG. 4”) (emphasis added); Ex. 1005, [0107]–[0108] (explaining that Figures 11 and 12 also “depict[] the mobile station (MS) *informing the serving base station of the CGI* which was acquired”) (emphasis added).

[0100] Thus, *Amirijoo* discloses a receiver configured for receiving the cell information from the one or more of the selected user terminals.

**f) [1e] updating means configured for updating at least one of the first neighbour cell list and the second neighbour cell list using the received cell information.**

[0101] *Amirijoo-3GPP TR 32.816* discloses and renders obvious element [1e]. *Amirijoo* teaches “Methods & apparatus to detect new inter-RAT/frequency neighbor base stations using mobile station (MS) measurements,” “retrieve the neighbor base station (BS) CGIs” from the mobile terminals, and “update[] the NRL” using the received cell information. Ex. 1005, [0028]–[0030]; *see also* Ex. 1005, [0115] (“Automatic inter-RAT/frequency NRL management as described herein leads to lower costs for the operators in planning and maintaining neighbor relation lists (NRLs), which are needed for seamless inter-RAT/frequency mobility.”).

[0102] *Amirijoo* discloses that “[b]ased on the inter-RAT/frequency measurement reports and the information retrieved from the lookup, the candidate base station (BS) can be added to the neighbor relation list (NRL) of the serving base

station (BS).” Ex. 1005, [0082]. Accordingly, *Amirijoo* teaches that the serving base station is configured to update its neighbor relation list based on received cell information for new inter-RAT/frequency neighbors.

[0103] *Amirijoo* also teaches an “optional act” wherein “the serving base station (BS) can inform an NRL handler, such as an Operation and Support System (OSS) or any other management node, about the newly detected candidate base station (BS).” Ex. 1005, [0082]. Upon receipt of such information from the serving base station, the “NRL handler” disclosed in *Amirijoo* is configured to “inform[] the candidate base station (BS) regarding the new neighbor relation.” Ex. 1005, [0082]. This enables the candidate base station to update its NRL with cell information of the serving base station. Ex. 1005, [0082]. Based on this disclosure, a POSITA would appreciate that *Amirijoo* teaches means for updating the NRL of the serving base station (*i.e.*, a “first” NRL) and means for updating the NRL of the candidate base station (*i.e.*, a “second” NRL).

[0104] Further, *3GPP TR 32.816* discloses an algorithm for updating conventional neighbor cell lists. Ex. 1007, 11. Specifically, the algorithm disclosed in *3GPP TR 32.816* is configured to update neighbor cell lists using cell information received from mobile terminals. Ex. 1007, 11 (“Known neighbours can be checked if they are really appropriate concerning real RF conditions, new ones can be included based on information in UEs about detected cells.”). For the same reasons

discussed in Sections IX(C) and IX(D)(1)(a) (incorporated herein by reference), it would be obvious to a POSITA to combine *Amirijoo*'s means for updating NRLs with the neighbor cell lists taught in *3GPP TR 32.816*.

[0105] The combined teachings of *Amirijoo-3GPP TR 32.816* disclose to a POSITA the structure corresponding to the claimed “updating means” in the ’560 Patent (*i.e.*, “updater 14”). As explained in Section VIII(A) (incorporated herein by reference), “updater 14” is essentially a function block connected to a receiver and configured to add cell information for newly discovered neighbors to the base station’s neighbor cell list. *See* Ex. 1001, Fig. 2. Likewise, *Amirijoo-3GPP TR 32.816* teaches an analogous function block connected to a receiver and configured to add cell information for newly discovered neighbors to the base station’s neighbor cell list. *See* Ex. 1005, [0082] (teaching that the base station is configured to add cell information to its NRL corresponding to the candidate base station), Ex. 1007, 11 (disclosing similar functionality for adding the cell information of newly discovered neighbors to a neighbor cell list, rather than the NRLs discussed in *Amirijoo*). In my opinion, *Amirijoo-3GPP TR 32.816* teaches an “updating means” that is identical or at least equivalent to the structure disclosed in the ’560 Patent for this claim element.

**2. Claim 6**

- a) **[6a] The system according to claim 1, wherein the request generator is configured for requesting from the first wireless access node one or more of the selected user terminals to report cell information of a plurality of wireless access nodes of the second wireless access network;**

[0106] As previously discussed, *Amirijoo-3GPP TR 32.816* discloses and renders obvious the system of Claim 1 wherein the request generator is configured for requesting from the first wireless access node one or more of the selected user terminals to report cell information of a plurality of wireless access nodes of the second wireless access network. *Amirijoo* teaches a serving base station (*i.e.*, “first wireless access node”) comprising a request generator configured for requesting one or more selected user terminals to report the local IDs and GCIs (*i.e.*, “cell information”) of neighboring inter-RAT/frequency cells of candidate base stations (*i.e.*, “a plurality of wireless access nodes of the second wireless access network”).

- b) **[6b] wherein the receiver is configured for receiving the cell information of the wireless access nodes of the second wireless access network via the first wireless access node,**

[0107] *Amirijoo-3GPP TR 32.816* discloses and renders obvious the system of Claim 1 wherein the receiver is configured for receiving the cell information of the wireless access nodes of the second wireless access network via the first wireless access node. As explained above, *Amirijoo* teaches that the receiver of the serving

base station (*i.e.*, the “first wireless access node”) is configured for receiving, among other things, the local IDs and GCIs (*i.e.*, “cell information”) of neighboring inter-RAT/frequency cells of candidate base stations.

- c) **[6c] further comprising a transfer system configured for transferring user terminals from the first wireless access network to the second wireless access network after receiving the one or more cell parameters of wireless access nodes of the second wireless access network via the first wireless access node.**

[0108] *Amirijoo-3GPP TR 32.816* discloses and renders obvious the system of Claim 1 further comprising a transfer system configured for transferring user terminals from the first wireless access network to the second wireless access network after receiving the one or more cell parameters of wireless access nodes of the second wireless access network via the first wireless access node. As noted above, Figure 3 of *Amirijoo* illustrates “a representative mobile terminal and radio access network nodes which are involved in an example inter-RAT/frequency handover.” Ex. 1005, [0050]. As shown below, the user terminal 30), the serving base station (28<sub>S</sub>), and the candidate base station (28<sub>C</sub>) have a data processing and control unit including an “inter-RAT/frequency handover function” (40, 50<sub>S</sub>, and 50<sub>C</sub>, respectively). Ex. 1005, [0075], [0077].

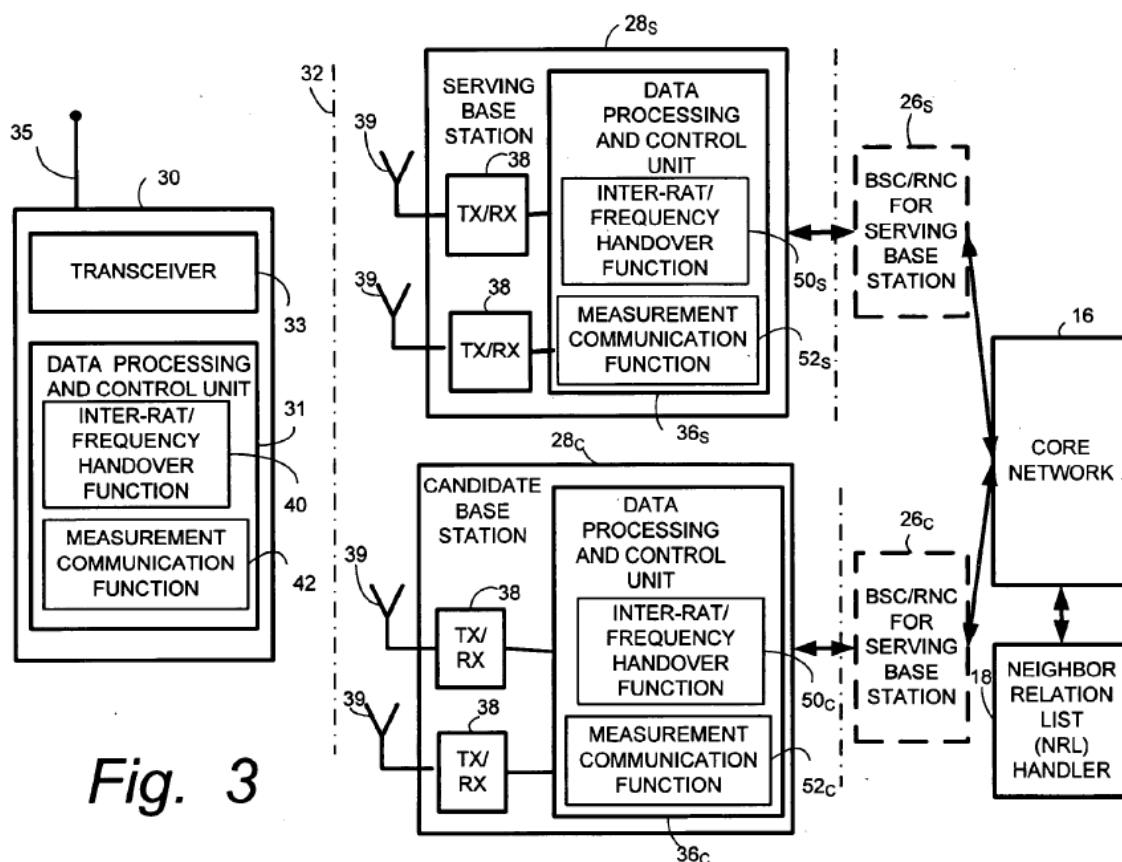


Fig. 3

Ex. 1005, Fig 3.

[0109] *Amirijoo* teaches that the “inter-RAT/frequency handover function” in both the user terminal and base stations “is invoked when it is determined that a handover is to occur.” Ex. 1005, [0075], [0077]; *see also* Ex. 1005, [0017]–[0020] (summarizing “events [that] typically need to be performed to prepare for HOs from a serving base station (BS) to a target base station (BS) (e.g. from a E-UTRAN BS to a UTRAN BS)”). A POSITA would know that the inter-RAT/frequency handover functions disclosed in *Amirijoo* work together during handover to provide a transfer

system configured for transferring a user terminal from the first wireless access network to the second wireless access network.

[0110] As explained in *Amirijoo*, the actual handover occurs after the serving base station (*i.e.*, the “first wireless access node” receives Local IDs and CGIs (*i.e.*, “cell parameters”) of wireless access nodes of the second wireless access network. Indeed, *Amirijoo* explains that “the serving base station (BS) needs to forward user plane data to the target base station (BS), meaning that *the target base station (BS) must be known and its unique identity, so-called Cell Global Identity (CGI), must be established before executing the HO.*” Ex. 1005, [0013] (emphasis added); *see also* Ex. 1005, [0014] (“[W]hen handing off a mobile station (MS) to the neighbor the CGI of the neighbor must be known.”). Thus, *Amirijoo-3GPP TR 32.816* teaches a transfer system configured for transferring user terminals to a candidate base station in a second wireless network after receiving cell parameters of wireless access nodes of the second wireless access network via the serving base station.

### 3. Claim 7

- a) **The system according to claim 1, wherein the telecommunications system is further configured for receiving location information from one or more of the detected user terminals and wherein the location information is used as a selection parameter for selecting the part of the detected user terminals.**

[0111] As explained above, *Amirijoo-3GPP TR 32.816* discloses and renders obvious the system of Claim 1 further configured for receiving location information from one or more of the detected user terminals and wherein the location information is used as a selection parameter for selecting the part of the detected user terminals.

[0112] I understand that Patent Owner interprets the “location information from one or more of the detected user terminals” to be satisfied by “information regarding at least the cell in which the terminal is operating, such cell corresponding to a particular geographic coverage area.” Ex. 1011, 7-8.

[0113] *Amirijoo* teaches that “[a] cell is a geographical area where radio coverage is provided by the radio base station equipment at a base station site.” Ex. 1005, [0013]. *Amirijoo* further teaches that “[e]ach cell is identified by a identity within the local radio area, which is broadcast in the cell.” Ex. 1005, [0013]. Accordingly, under Patent Owner’s interpretation of Claim 7, a cell’s identity is “location information” because it is information regarding the geographic coverage area in which a mobile terminal is operating. *Amirijoo* discloses selecting a part of the mobile terminals to participate in the process of updating the neighbor relation list based, at least in part, on information regarding the cell in which the mobile terminal(s) are currently operating. Ex. 1005, [0083]–[0088].

[0114] Even if Patent Owner’s interpretation is not adopted, *Amirijoo-3GPP TR 32.816* still teaches receiving location information from one or more of the

detected user terminals and using the location information as a selection parameter for selecting the part of the detected user terminals. Specifically, *3GPP TR 32.816* teaches an algorithm for updating neighbor cell lists using information regarding “location of the neighbours.” Ex. 1007, 11. Similarly, *3GPP TR 32.816* also teaches that, in the “ideal” case, “all measurements can be linked with correct location information” when optimizing handover parameters, including the “HO neighbor list, neighbor specific thresholds, margins and hysteretic parameter.” Ex. 1007, 13–14.

[0115] It would have been obvious for a POSITA to use location information as a selection parameter for selecting a part of the user terminals in the context of *Amirijoo*’s system in light of *3GPP TR 32.816*’s suggestion to use location information as an input to update the neighbor cell list. *Amirijoo* teaches that the triggering criteria disclosed therein is intended, in at least some embodiments, “to make sure that an inter-RAT/frequency neighbor is found before the mobile station (MS) falls out of coverage.” Ex. 1005, [0087]. A POSITA would know that selecting a subset of mobile devices based on their location information would help ensure that an inter-RAT/frequency neighbor is found before the mobile station (MS) falls out of coverage. For example, it would have been obvious to a POSITA to configure the serving base station to select one or more mobile terminals close to the coverage boundary and instruct the selected mobile terminal(s) to initiate inter-

RAT/frequency measurements. This would help ensure that a suitable handover target is identified before the mobile terminal “falls out of coverage.” Ex. 1005, [0087]. Accordingly, Claim 7 is obvious in view of *Amirijoo-3GPP TR 32.816*.

#### 4. Claim 8

- a) **The system according to claim 1, wherein one or more thresholds, possibly service-dependent, are defined in the telecommunications system for transferring the user terminals between the first wireless access network and the second wireless access network and wherein at least one of the thresholds is used as a selection parameter for selecting the part of the detected user terminals.**

[0116] As explained above, *Amirijoo-3GPP TR 32.816* discloses and renders obvious the system according to Claim 1 wherein one or more thresholds, possibly service-dependent, are defined in the telecommunications system for transferring the user terminals between the first wireless access network and the second wireless access network and wherein at least one of the thresholds is used as a selection parameter for selecting the part of the detected user terminals.

[0117] *Amirijoo* teaches that various “triggering conditions” are used to select a part of the user terminals. *See supra* Section IX(D)(1)(c). *Amirijoo* further teaches “[t]he actual triggering condition(s) compris[e], e.g., rules and thresholds,” which “may be evaluated at the base station (BS) or the mobile station (MS).” Ex. 1005, [0079]. With respect to threshold-based triggering conditions, *Amirijoo* teaches that

“[m]obile stations with an estimated signal quality of the serving base station (BS) below a given threshold (*see* threshold C in FIG. 6) perform inter-RAT/frequency measurements.” Ex. 1005, [0085]. *Amirijoo* even teaches that the threshold used to select user terminals is possibly service-dependent, which is closely similar to the language of Claim 8. *Compare* Ex. 1001, Claim 8 (claiming “one or more thresholds, possibly service-dependent . . . used as a selection parameter) *with* Ex. 1005, [0089] (“[T]he threshold C can depend on the service, subscription type, UE type etc. For example, Gold Subscription users are assigned lower threshold C than ordinary subscription users to avoid bulk measurements to a larger extent.”).

[0118] Accordingly, Claim 8 is obvious in view of *Amirijoo-3GPP TR 32.816*.

## **X. CONCLUSION**

[0119] In summary, it is my opinion that all of the limitations recited in Claims 1 and 6–8 of the ’560 Patent are disclosed or suggested by the prior art.

[0120] I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Declaration of Mark Mahon  
in Support of Petition for *Inter Partes* Review  
Patent No. 8,660,560

Respectfully submitted,

Dated: 2/17/2023

By: Mark P. Mahon  
Mark P. Mahon, Ph.D