

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ONEPLUS TECHNOLOGY (SHENZHEN) CO., LTD.,
Petitioners

v.

PANTECH WIRELESS, LLC,
Patent Owner

U.S. Patent No. 10,764,803
Filed: August 6, 2019
Issued: September 1, 2020
Inventor: Stephen G. Dick, et al.

TITLE: ENHANCED UPLINK OPERATION IN SOFT HANDOVER

Inter Partes Review No. IPR2025-00756

**DECLARATION OF APOSTOLOS K. KAKAES PH.D. IN SUPPORT OF
PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO.
10,764,803**

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I, Apostolos K. Kakaes, Ph.D., declare as follows:

I. INTRODUCTION

1. I have been retained by OnePlus Technology (Shenzhen) Co., Ltd. (“OnePlus” or “Petitioner”) as a technical expert in connection with a petition for *inter partes* review (“IPR”) of U.S. Patent No. 10,764,803 (“the ’803 patent,” EX1001). I understand that the ’803 patent is assigned to Pantech Wireless, LLC. (“Pantech” or “Patent Owner”).

2. I am being compensated for my time in this matter at an hourly rate. I am also being reimbursed for reasonable and customary expenses associated with my work and testimony in this matter. 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 matter. I have no personal or financial stake or interest in the outcome of the present proceeding.

3. I have been asked, by counsel for Petitioner, to provide opinions based on my experience with and expertise in wireless communication technologies. In particular, I have been asked to offer opinions regarding the patentability of claims 1, 2, 5, 6, 7, 8, 11, and 12 of the ’803 patent (the “Challenged Claims”) in view of certain prior art references and the knowledge of a person of ordinary skill in the art (“POSITA”).

4. I have been asked by Petitioner to provide my opinion whether the Challenged Claims of the '803 patent would have been obvious to a POSITA. In performing my analysis, I have determined that the actual priority date of the '803 patent is its filing date, August 6, 2019. However, to the extent that the claims are entitled to an earlier date, I have also analyzed prior art as of the time of the earliest claimed priority date of the '803 patent, namely August 25, 2003.

5. Throughout this Declaration, I refer to specific passages, figures, and/or other portions of various exhibits. These citations are illustrative and are not intended to suggest that they are the only support for the proposition for which they are cited.

II. QUALIFICATIONS AND PROFESSIONAL BACKGROUND

6. My qualifications and professional experience are described in my curriculum vitae, a copy of which is provided herewith as Appendix A. The following is a brief summary of my relevant qualifications and professional experience.

7. I have personal knowledge and expertise concerning the relevant technologies based upon my education, training, or experience. My relevant experience includes a deep understanding of the systems that we broadly refer to as "1G," "2G," "3G," "4G," "LTE," and "5G" communications systems, as well as other wireless communication technologies, including those based on the IEEE

802.11 set of standards (often referred to as WiFi), those related to IEEE 802.16 set of standards (often referred to as WiMAX).

8. I am an expert in the field of communication engineering and specifically, among others, the field of wireless communications. I have over 40 years of experience in electrical engineering and computer science and in fixed and mobile communications networks. I attended the University of Colorado from 1974 to 1980, during which I earned a Bachelor of Science (B.S.) and a Master of Science (M.S.) in applied mathematics with a minor in electrical engineering. I attended the Polytechnic Institute of New York between 1982 and 1988, during which I earned a Doctor of Philosophy (Ph.D.) in electrical engineering, with a minor in applied mathematics. My Ph.D. thesis was titled “Topological Properties and Design of Multihop Packet Radio Networks.” While pursuing my Ph.D. degree, I held a joint appointment as Special Research Fellow and Adjunct Instructor at the Polytechnic Institute of New York between 1985 and 1986 teaching graduate-level courses in Electrical Engineering.

9. Between 1982 and 1987, I worked at AT&T Bell Laboratories in Holmdel, New Jersey. While at AT&T Bell Laboratories, I worked on modeling, analysis, design, and performance evaluation of voice and data networks. I developed algorithms for DNHR (Dynamic, Non-Hierarchical Routing) used in the telephone network. I also analyzed advanced data services and formulation of

long-term plans for development of enhanced data services and network design tools to support such services.

10. I was an Assistant Professor of Electrical Engineering and Computer Science at The George Washington University (GWU) in Washington, D.C., between 1987 and 1994. During my association with GWU, I taught graduate courses in the area of communication engineering, including communication theory, coding theory, voice and data networking, and mobile communications. In the early 1990s I developed and taught the first course on Mobile Communications at GWU to Electrical Engineering graduate students. I also received several research awards/grants, including the prestigious NSF Research Initiation Award.

11. In 1988, I founded Cosmos Communications Consulting Corporation (“Cosmos”), which is a private communications engineering consulting firm specializing in mobile communications, and I have been the President of the company since its founding. Since 1994, I have worked full-time at Cosmos. At Cosmos, among various activities, I have consulted on high level technology-related issues and trends to corporate entities, governmental agencies, and international organizations, such as the United Nations.

12. I have provided technical consultancy to engineering firms, operators, and equipment vendors on issues related to existing or evolving technologies for mobile communications, and to the investment community on issues related to

both fixed and wireless communications technologies. I developed and taught hundreds of courses to thousands of engineers around the world in the area of communication engineering, mostly in the area of mobile, wireless communications.

13. Over the course of my career, I have authored and co-authored some thirty (30) publications on various aspects of fixed and mobile communications, as noted in my curriculum vitae. I am a life member of the Institute of Electrical and Electronics Engineers (IEEE) and have been actively involved in the Communications Society and the Information Theory Society of the IEEE. Between 1991 and 1992, I served as the Secretary of IEEE Communications Society National Capital Area Chapter. Between 1992 and 1993, I was the Vice-Chair of IEEE Communications Society National Capital Area Chapter. I was the Vice-Chair of the Communication Theory Technical Committee of the Communications Society of the IEEE for the 1993–1996 term, and Treasurer of the Communication Theory Technical Committee of the Communications Society of the IEEE for the 1996–1999 term.

14. I have served as a reviewer for the IEEE, book editors, other technical publications, and various National Science Foundation (NSF) Panels. I have organized technical sessions in technical conferences, including the IEEE International Conference on Communications (ICC) and IEEE Global

Communications Conference (Globecom). I served as the Technical Program Chair for the Communication Theory Mini-Conference in 1992.

15. During the past 35+ years, I have been lucky enough to be part of the community of engineers that have contributed to the astounding growth of the mobile communications industry. It started from a niche industry that was thought of as being something for the “rich and the famous” to becoming one of the most widespread household concepts, providing useful tools to all segments of the global society.

16. My involvement in this industry has included providing consulting services to company executives who needed to make deployment plans, taking into consideration the strengths and weaknesses of the technology, economics, user value, etc. As such, I have developed a deep understanding of all aspects of a given technology, its features, added value, and the like. In addition, my consulting services has included developing courses for the companies that were at the forefront of this developing technology. By definition, this previously non-existent technology was not taught in university courses, as it was too new. Having developed hundreds of courses over the years and taught thousands of engineers (and non-engineers alike), I have a solid understanding and knowledge of the technical developments and how their importance fits in the larger puzzle of a fast-developing technology.

17. My consulting has included providing training to engineers in the field that were deploying the various networks. For example, I have developed courses and provided training and consulting to the engineers deploying some of the earliest GSM networks in Germany and France, to be followed by many countries in Europe and around the world, including the United States when it was decided that GSM would be used in the U.S. Successful deployments of the initial GSM systems were followed by deployments of GPRS and EDGE, which was then followed by deployments of 3G UMTS systems worldwide. Of course, the 3G systems were followed by the currently most widespread deployments of 4G systems, also referred to as LTE, worldwide and most recently deployments of 5G networks. Thus, as I explain above, my experience includes a deep understanding of the entirety of each system that we broadly refer to as “1G,” “2G,” “3G,” “4G,” “LTE,” and “5G.”

18. Similarly, I have developed courses and provided training and consulting to engineers deploying and/or enhancing wireless local area networks using one or more of the IEEE 802.11 set of standards (often referred to as WiFi) as well as networks using the IEEE 802.16 set of standards (often referred to as WiMax).

19. As an expert consultant, I have served on both civil and criminal legal cases, including several patent infringement cases both at the ITC and in district

courts, as well as in support of IPR petitions at the Patent Trial and Appeal Board (PTAB) of the United States Patent and Trademark Office. I have also participated as a technical expert consultant in the analysis of large patent portfolios for the purposes of due diligence, sales, and merger and acquisition activities for some of the largest companies in the mobile communications space. These projects span a multidimensional spectrum of technologies in both fixed and mobile communications as they have evolved over the past more than 30 years.

III. INFORMATION CONSIDERED

20. In forming my opinions, I read and considered the '803 patent and its prosecution history, the exhibits listed in the Exhibit List below, as well as the other materials referenced herein.

Exhibit	Description
1001	U.S. Patent No. 10,764,803 (“the '803 Patent”)
1002	File History of the '803 Patent
1003	Reserved
1004	Declaration of Friedhelm Rodermund
1005	Publication “R2-020088 – Mobility examples when the UE has an HS-PDSCH assignment” (“Ericsson”)
1006	3GPP Technical Specification 25.331, v5.5.0 (“TS25.331”)
1007	International Application Publication No. WO2003034766A2 to Sebire et al. (“Sebire”)

Exhibit	Description
1008	3GPP Technical Specification 36.300, v10.6.0 (“TS36.300”)
1009	3GPP Technical Specification 36.321, v10.6.0 (“TS36.321”)
1010	3GPP Technical Specification 36.331, v10.6.0 (“TS36.331”)
1011	Shu Lin and Daniel Costello, Jr.; Error Control Coding: Fundamentals and Applications; (Excerpts) Prentice Hall, 1983 (“Lin”)
1012	Michel Mouly and Marie-Bernadette Pautet; The GSM System for Mobile Communications; 1992 (“Mouly”)
1013	Dimitri Bertsekas and Robert Gallager; Data Networks; Second Edition (Excerpts) Prentice Hall 1992 (“Bertsekas”)
1014	Regis J. “Bud” Bates; GPRS; General Packet Radio Service; (Excerpts); McGraw-Hill 2002 (“Bates”)
1015	Jhong Sam Lee and Leonard E. Miller; CDMA Systems Engineering Handbook; Artech House Publishers 1998 (“Lee”)
1016	Harri Holma and Antti Toskala; WCDMA for UMTS; Radio Access For Third Generation Mobile Communications; John Wiley, 2000 (“Holma”)
1017	U.S. Patent No. 8,023,463 (the “’463 patent”)
1018	U.S. Patent No. 9,438,381 (the “’381 patent”)
1019	U.S. Patent No. 10,390,279 (the “’279 patent”)
1020	Plaintiff’s Infringement Contentions for the ’803 Patent from <i>Pantech Corp. v. Oneplus Tech. (Shenzhen) Co., Ltd.</i> , 5:24-cv-00038-RWS-JBB (E.D. Tex.)
1021	<i>Pantech Corp. v. Oneplus Tech. (Shenzhen) Co., Ltd.</i> , 5:24-cv-00038-RWS-JBB (E.D. Tex.), Dkt. No. 39, Docket Control Order

Exhibit	Description
1022	<i>Pantech Corp. v. Oneplus Tech. (Shenzhen) Co., Ltd.</i> , 5:24-cv-00038-RWS-JBB (E.D. Tex.), Dkt. No. 49, Joint Claim Construction Chart and Prehearing Statement

21. The opinions contained in this Declaration are based on the information I considered and my knowledge and professional judgment, guided by my understanding of how a POSITA would have understood the claims of the '803 patent at the time of the earliest claimed priority date. I have also relied on my education, experience, research, training, and knowledge in the relevant art, and my understanding of any applicable legal principles described in this Declaration.

22. I reserve the right to supplement and amend any of my opinions in this Declaration based on documents, testimony, and other information that becomes available to me after the date of this Declaration.

IV. LEGAL STANDARDS

23. I am not a lawyer. For purposes of this Declaration, I have been asked to provide my opinions on issues regarding unpatentability. I have been informed of the following legal standards, which I have applied in forming my opinions. My understanding of the legal standards to apply in reaching the conclusions in this Declaration is also based on my experience applying similar standards in other patent-related matters, and my consideration of the materials submitted in this proceeding.

24. I have been informed that there are two ways in which prior art may render a patent claim unpatentable. First, I have been informed that the prior art can “anticipate” a claim. Second, I have been informed that the prior art can render a claim “obvious” to a person of ordinary skill in the art.

25. I have been informed that a dependent claim is a patent claim that refers back to another claim of the same patent. I have been informed that a dependent claim includes all of the limitations of the claim or claims to which it refers.

26. I have been asked to provide my opinions as to whether the prior art teaches or renders obvious claims 1, 2, 5, 6, 7, 8, 11, and 12 of the ’803 patent (the “Challenged Claims”) from the perspective of a POSITA at the ’803 patent’s earliest claimed priority date of August 25, 2003.

27. I have been informed that in this IPR proceeding, the party challenging the patent bears the burden of proving unpatentability by a preponderance of the evidence. I understand that a preponderance of the evidence means “more likely than not.”

A. Level of Ordinary Skill in the Art

28. It is my understanding that the claims and specification of a patent are to be read and construed through the eyes of a hypothetical person of ordinary skill in the art (i.e. “POSITA”) at the time the alleged invention was made. To

determine the appropriate level of one of ordinary skill in the art, I have been informed that the following factors may be considered: (a) the types of problems encountered by those working in the field and prior art solutions thereto; (b) the sophistication of the technology in question, and the rapidity with which innovations occur in the field; and (c) the educational level of active workers in the field.

29. I have been instructed to assume a POSITA is not a specific real individual, but rather a hypothetical individual having the qualities reflected by the factors discussed above.

B. Claim Construction

30. I have also been informed that, in order to assess whether the prior art satisfies a certain claim element in an invalidity analysis, the claim element must first be construed, and then the prior art must be evaluated to determine whether it satisfies the properly-construed element of the claim. I have been informed that a patent claim is to be construed from the perspective of a POSITA at the time the alleged invention was made, taking into account the claim language, the teachings of the patent specification, and the prosecution history.

31. I have been informed that the claims in the '803 patent should generally be understood in accordance with their plain and ordinary meaning, in the context of the '803 patent, to a POSITA at the time the purported invention was

made. Unless otherwise specifically noted, my opinions in this Declaration are consistent with that plain and ordinary meaning.

C. Prior Art

32. I have been advised and understand the information used to evaluate whether an invention was new and not obvious when made is generally referred to as “prior art.” I understand that prior art includes patents and printed publications that existed before the earliest priority date of the patent or the earliest invention date of the patent that can be established. I have been informed and understand that a patent or published patent application is prior art if its effective filing date is before the earliest priority date of the patent, or the earliest invention date of the claimed invention that can be established, and that a printed publication is prior art if it was publicly available before the earliest priority date of the patent or the earliest invention date that can be established. I am not aware of any evidence that would establish an invention date for any of the Challenged Claims that is earlier than the earliest claimed priority date, i.e., August 25, 2003. My opinions relating to grounds two and three in this Declaration take the viewpoint of a POSITA in the timeframe immediately prior to the earliest claimed priority date of the Challenged Claims of the ’803 patent, i.e. August 25, 2003. *See infra* Section VI.B.

D. Anticipation

33. I have been informed that a patent claim is invalid under 35 U.S.C. § 102 as being anticipated if each limitation of the claim is disclosed expressly or inherently in a single prior art reference. I further understand that a limitation is disclosed inherently if it is necessarily present in the prior art reference or is the natural result flowing from the disclosure of the prior art reference.

E. Obviousness

34. I have been informed that a patent claim is invalid under 35 U.S.C § 103 as being obvious if the differences between the claimed subject matter and the prior art are such that the claimed subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. I also understand that, in order to assess whether a claim would have been obvious in light of the prior art, I must step back in time and take the viewpoint of a POSITA at the time the invention was unknown and just before it was made. I must then make a determination whether the claimed invention “as a whole” would have been obvious at that time to a POSITA.

35. I have been informed that the following facts are considered in determining whether a claimed invention is invalid as obvious over the prior art:

- (1) the scope and content of the prior art; (2) the level of ordinary skill in the art;
- (3) the differences between the claimed invention and the prior art and (4) any

“secondary considerations” that may serve as evidence of nonobviousness, such as commercial success, long felt but unsolved needs, and failure of others.

36. I have been informed that, in an obviousness analysis, prior art must be analogous prior art to the patent being considered. I have been informed that a prior art reference is considered to be analogous, or in the same field of art, if the reference is either (1) in the same field of endeavor as the challenged patent, regardless of the problems the challenged patent and the prior art address, or (2) reasonably pertinent to the particular problem being solved by the challenged patent.

37. I have been informed that whether a prior art reference renders a patent claim obvious is determined from the perspective of a POSITA. I have been informed that a POSITA is presumed to know all relevant prior art, which are those that are in the same field of endeavor or are reasonably pertinent to the problem faced by the inventor. I have been informed that a reference may be modified or combined with other references or with a POSITA’s own knowledge if a POSITA would have found the modification or combination obvious. In considering whether a claim is obvious, I can take account of inferences and creative steps that a POSITA would have employed, and the common knowledge of the art that a POSITA would have possessed.

38. I have been told that there is no rigid rule that a reference or combination of references must contain a “teaching, suggestion, or motivation” to combine references. However, I have also been informed that the “teaching, suggestion, or motivation” test can be a useful guide in establishing a rationale for combining elements of the prior art. I have been informed that this test poses the question as to whether there is an express or implied teaching, suggestion or motivation to combine prior art elements in a way that realizes the claimed invention, and that it seeks to counter impermissible hindsight analysis.

39. I have also been informed that the combination of familiar elements disclosed in the prior art according to known methods is likely to be obvious when it does no more than yield predictable results. I understand that if a technique has been used to improve one product and a POSITA would recognize that it would improve similar products in the same way, the use of that technique is obvious—unless its actual application is beyond the skill of a POSITA. I have been informed that the proper obviousness analysis considers whether a POSITA would have a “reasonable expectation of success”—and not an “absolute predictability” of success—in achieving the claimed invention by modifying and/or combining prior art references.

40. I have been informed that obviousness does not require that the prior art contain an express suggestion to combine known elements to achieve the

claimed invention. A reason to combine known elements to achieve the claimed invention may come from the prior art as a whole or individually, as filtered through the knowledge of a POSITA. A reason for combining the elements in the manner claimed may also come from any need or problem known in the field.

41. I have been informed that, when a work is available in one field, design alternatives and other market forces can prompt variations of it, either in the same field or in another. I have been informed that if a POSITA could have implemented a predictable variation and would have seen the benefit of doing so, that variation is likely to have been obvious. I have also been informed that if a POSITA can implement a predictable variation and would see the benefit of doing so, that variation is likely to be obvious. I have been informed that in many fields, there may be little discussion of obvious combinations in the scientific literature and market demand may drive design trends. I have been informed that, when there is a design need or market pressure and a finite number of predictable solutions, it would be obvious to a POSITA to pursue those known options.

42. I am not aware of any evidence of secondary considerations that would support a determination of non-obviousness of the Challenged Claims of the '803 patent.

F. Priority and Written Description

43. I understand that a patent application may rely on the filing date of an earlier-filed application on a claim-by-claim basis if the claim in question has written description support in the earlier-filed application. I also understand that, in order to satisfy the written description requirement, the specification must reasonably convey to a POSITA that the inventor had possession of the claimed subject matter.

V. FIELD OF TECHNOLOGY AND STATE OF THE ART

44. For the invalidity analysis in grounds two and three, I have used the earliest possible priority date of the challenged claims, which is August 25, 2003. *See infra* Section VI.B. Therefore, I have provided an overview of the background of the relevant technology at that time.

A. Field of Technology

45. In the “FIELD OF INVENTION”, the ’803 patent states that the invention “is related to wireless communications” and “[m]ore particularly, the present invention is related to an enhanced uplink (EU) operation during a soft handover.” EX1001 at 1:20-25.

46. The ’803 patent then provides various embodiments including ones involving a soft handover as well as softer handover. In the BACKGROUND section the patent explains that “soft handover occurs when a WTRU is connected

to two or more Node-Bs simultaneously, on the same frequency.” EX1001 at 1:42-43. It further explains that “[s]oft handover is a special case of soft handover. When a WTRU is in softer handover, the WTRU is connected to two or more cells belonging to the same Node-B.” EX1001 at 1:50-52.

47. The above is consistent with a POSITA’s knowledge at the time. For example, a relevant book is Lee (EX1015) which explains that soft handoff “allows simultaneous transmission to and from the mobile station through two base stations or cells” EX1015 at pg. 4. I note that over the years, the terms “handover” and “handoff” have been used interchangeably.

48. As Lee further explains, the handover “is termed ‘soft’ because the connection of the mobile with one station is not broken off until one is established with the new station, rather than the ‘hard’ handoff procedure that is necessary in analog FDMA cellular systems because the receiver must tune to a new frequency.” EX1015 at pg. 5. Lee further explains that “[a] ‘softer’ handoff can occur in an IS-95 CDMA system when the mobile is in transition between two sectors of the same cell site.” *Id.* at pg. 5.

49. Lee’s reference to the IS-95 system is also made by other books at the time of the purported invention of the ’803 patent. For example, handover in general, including soft handover, as implemented in IS-95 and in WCDMA is discussed in Section 9.3 of Holma. EX1016 at pgs. 5-12.

50. The above referenced IS-95 and UMTS will be discussed below as part of the development of mobile communications standards.

B. Third Generation Partnership Project (3GPP)

51. “Wireless communications” necessarily implies that information is transmitted without the use of “wires.” This is accomplished by transmitting electromagnetic waves from some point of origin A with the intent that the radio waves will be successfully received at some intended destination point B.

52. The “Advanced Mobile Phone System” (AMPS) was the first nationwide wireless communications system standardized in the USA. AMPS is referred to as a first generation or “1G” cellular communication technology. A subsequent short-lived system referred to as IS-54 developed only to be quickly replaced by a better system referred to as IS-136. IS-54 and IS-136 are now commonly referred to as second generation or “2G” technologies. Around the same time, Qualcomm began developing a different system to replace AMPS in direct competition with IS-54/IS-136. This new system was standardized in what is called the “IS-95 standard,” or simply just “IS-95.” IS-95 was the first ever code division multiple access (CDMA) based digital cellular technology. CDMA allows multiple access to the digital radio for transmission of voice, data, and signaling data. IS-95 was first published in 1995 and adopted as a wireless communications standard in the USA by the Telecommunications Industry Association. IS-95A

was a follow up version of IS-95 with increased functionality and capabilities relative to the original IS-95.

53. Around this same time period as the IS-95/IS-95A were being developed in the USA, the European Telecommunications Standard Institute (ETSI) developed the Global System for Mobile Communications (GSM) technical specifications. Unlike IS-95, GSM is based on a time division multiple access (TDMA) technology. Similar to IS-54 and IS-136, IS-95 and GSM are also commonly referred to as “2G” technologies as they were the first viable cellular systems to use digital transmission techniques, as opposed to the analog techniques used in AMPS.

54. GSM continued to evolve with the development of GPRS (General Packet Radio Service) and of EDGE (Enhanced Data rates for GSM Evolution). GPRS and/or EDGE have sometimes been referred to as “2.5G” even though there is no general agreement as to what exactly “2.5G” does or does not include. In any case, GSM came to enjoy greater market share globally than its IS-95 CDMA-based competitor. In the late 1990s, IS-95 had proven that an air interface based on CDMA was viable. Additionally, GSM had developed the necessary networking protocols that were second to none. In a somewhat unusual, but entirely rational and thus not unexpected way, the world converged in “marrying” the best aspects of the TDMA GSM system with the best aspects of the CDMA IS-

95 system to create an improved worldwide system. As part of that effort, a new organization was formed called the “3rd Generation Partnership Project,” or “3GPP.” The 3GPP was tasked with developing this new wireless communication specifications, which was referred to as a “3rd Generation” or “3G” specification.

55. The 3GPP is a joint undertaking by national and regional telecommunication standards organizations and member companies worldwide focused on defining interoperable telecommunications networks and user equipment. 3GPP was formed in 1998 with an initial objective of producing technical specifications for a third generation (“3G”) cellular communication system called the Universal Mobile Telecommunications Service (UMTS). UMTS is a 3G mobile cellular system for networks based on the second generation (2G) Global System for Mobile Communications (GSM) standard in conjunction with the best aspects of the IS-95/IS-95A air interface as I mentioned above.

56. While 3GPP is not formally a standards-setting organization, it operates as one from a practical perspective. 3GPP develops technical specifications that are then typically adopted by the respective standards-setting bodies of a given country or region. At the core of 3GPP’s organization lies seven “Organizational Partners,” each of which is a standards-setting organization in a different country or region:

- The Association of Radio Industries and Businesses, or ARIB (Japan);

- Telecommunication Technology Committee, or TTC (Japan);
- The Alliance for Telecommunications Industry Solutions, or ATIS (USA);
- China Communications Standards Association, or CCSA (China);
- The European Telecommunications Standards Institute, or ETSI (Europe);
- Telecommunications Standards Development Society, or TSDSI (India); and
- Telecommunications Technology Association, or TTA (Korea).

See, e.g., “About 3GPP” (<https://www.3gpp.org/about-us/partners>).

57. 3GPP employs a model similar to one that had been used earlier by the European Telecommunications Standards Institute (ETSI), which had developed GSM. There is a 3GPP hierarchical structure in which Working Groups (WGs) are the source of technical contributions, some of which ultimately mature into Technical Specifications. In addition, several WGs are part of a given Technical Specification Group, or TSG. There are several Technical Specification Groups (TSGs), each one of them having a number of WGs and covering technical subject matter that is defined and follows a logical, hierarchical structure. As in the 2012 time period, the current three active 3GPP TSGs are the Radio Access Network (RAN), Service and System Aspects (SA), and Core Network and Terminals (CT) TSGs. The RAN TSG is the TSG responsible for the standards relevant to '803 patent.

58. The RAN TSG, in turn, consists of several Working Groups, referred to, for example, as RAN1 and RAN2 or RAN WG1 and RAN WG2. Each WG holds period meetings in which technical documents (or TDoc for short) are presented and discussed for possible inclusion in the Technical Specifications (TS), sometimes also referred to as Technical Standards. These meetings are numbered and referred to as, for example, TSG-RAN WG2 Meeting #50, which refers to Meeting #50 of Working Group 2 of the RAN TSG. Different proposals are discussed, their pros and cons considered and ultimately some of them, or some hybrid of one or more of them, end up being approved and included in the TS.

59. In the late 1990s, 3GPP successfully developed UMTS, which enjoyed worldwide success. The UMTS “Radio Aspects” Technical Specifications are issued by 3GPP in the “Series 25 Specifications” as can be seen in the screen shot below, wherein I have checked the corresponding box:

The screenshot shows the 3GPP Specifications portal interface. At the top, there is a search bar and a dropdown menu for 'Series' set to '25. UTRA radio aspects'. Below this, a table lists specifications with columns for 'Specification Number' and 'Type'. The table includes entries from 25.053 to 25.142. To the right of the table, a sidebar shows a list of checkboxes for various specification aspects, with '25. UTRA radio aspects' checked.

Specification Number	Type
25.053	TS
25.05U	TS
25.101	TS
25.102	TS
25.103	TS
25.104	TS
25.105	TS
25.106	TS
25.107	TS
25.10U	TS
25.111	TS
25.113	TS
25.116	TS
25.123	TS
25.133	TS
25.141	TS
25.142	TS

See:<https://portal.3gpp.org/Specifications.aspx?q=1&series=30&releases=all&draft=False&underCC=False&withACC=False&withBCC=False&numberNYA=False>

60. A few years later, around 2004, 3GPP initiated a project that came to be known as Long Term Evolution (LTE). The LTE project had several goals for a fourth-generation (4G) cellular standard, including increased data rates, improved quality of service, and decreased complexity. Over the next four years, 3GPP worked to lay the groundwork for and develop the LTE technical specifications, which were first released in December of 2008, in what was called “Release 8”. As can be seen in the screen shot above, the “LTE Radio Aspects” are defined in the “Series 36” Technical Specifications.

61. LTE continued and still continues to be improved with new releases, i.e., Rel 9, Rel 10, and so on, and as of today, LTE is defined up to Release 18.

62. The '803 patent specifically refers to 3G UMTS system as developed by 3GPP as can be inferred from the acronyms and terminology used throughout the '803 patent, e.g., EU, Node-B, RNC, HSDPA, H-ARQ. EX1001, 1:23-65 and further supported by the plethora of "OTHER PUBLICATIONS" cited in the patent referring to 3GPP series 25 Technical Specifications (TS) as well as related 3GPP RAN working Group 1 and RAN Working Group 2 documents (See EX1001 at pg 3-5).

C. State of the Art

63. As I detail in Section VI below, the '803 patent "is related to a wireless communications. More particularly, the present invention is related to an enhanced uplink (EU) operation during a soft handover" (EX1001 at 1:21-25).

64. In the "SUMMARY" section the inventors explain that the "primary Node-B controls EU operation during soft handover including EU scheduling and H-ARQ [Hybrid Automatic Repeat Request]" (See EX1001 at 3:6-7 and 1:56-58).

65. Indeed, the patent is related to H-ARQ operation during a handover. In each of the two subsections below I discuss the state of the art with respect to handover and to H-ARQ, which sometimes is also abbreviated as HARQ, or referred to as "hybrid ARQ".

1. Handover: Hard/Soft/Softer

66. As discussed above in section V.A, the concept of handover (also called handoff) was well known in the existing art at the time of the purported invention of the '803 patent.

67. Specifically, as a mobile device is moving from a given location towards a new location, it is often the case that a base station A with which the device is communicating is no longer within the distance over which base station A is capable of maintaining a reliable communication. In a well-designed system, there will be another base station B with which the mobile device can communicate reliably. The process of recognizing that base station A is no longer viable and base station B is now viable and performing the change from communicating with A to communicating with B is called a handover or, synonymously, handoff.

68. In the early cellular systems, e.g., in GSM, there was only one type of handover, which later became known as a “hard handover”. In a hard handover, a communication between a mobile and a base station A is terminated as the communication between the mobile and a base station B is established.

69. Systems using spread spectrum technology, commonly referred to as Code Division Multiple Access (CDMA) are particularly amenable to using soft and/or softer handover. I discussed the concepts of soft and softer handover above

in Section V.A and incorporate that discussion herein, as it reflects the State of the Art at the time of the purported invention of the '803 patent.

2. ARQ and Hybrid Automatic Repeat Request (H-ARQ)

70. As the patent explains in the BACKGROUND section, “Automatic repeat request (ARQ)¹ is a technique whereby the receiver requests a retransmission of packets by the transmitter if errors are detected . Hybrid ARQ (H-ARQ) is a technique whereby transmitted data blocks are encoded for partial error correction at the receiver , and only data blocks with uncorrected errors are retransmitted” (See EX1001 at 1:56-61).

71. ARQ is considered to be a “Layer 2” functionality in the layered architecture of communication protocols, often referred to as Open System Interconnection (OSI). See, for example, Bertsekas, EX1013 at pgs. 4-19. The layered structure used in UMTS is also shown in Figure 4.2-1 of TS25.331, as shown below:

¹ While the initials for Automatic Repeat Request, for historical reasons that are not relevant the acronym that has been used is ARQ, highlighting the third letter in “request”, i.e., “Q”, rather than the first letter, “R”.

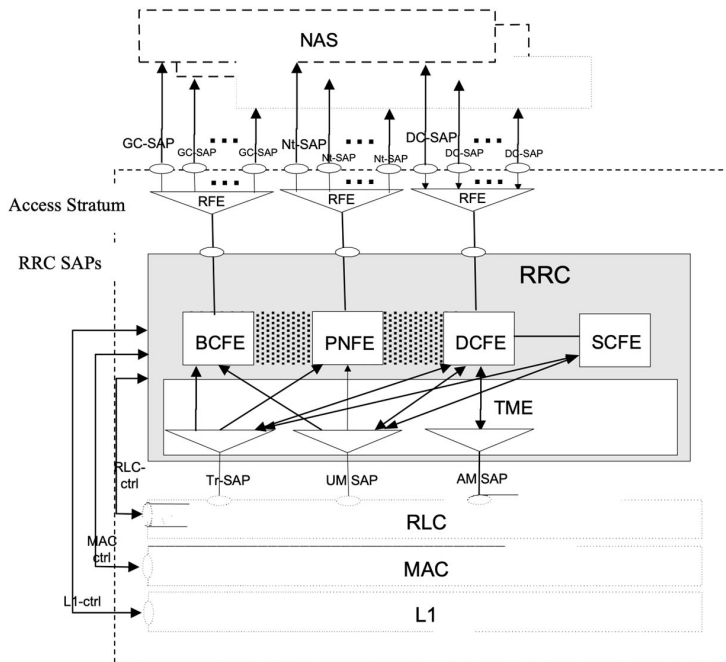


Figure 4.2-1: UE side model of RRC

EX1006 at pg 33.

72. As the figure shows, the RRC is the “top layer” (referred to as Layer 3) while L1 (also referred to as the “Physical Layer”) is the lowest layer with the MAC and the RLC being sublayers of Layer 2. Traditionally, error control coding is a Layer 1 (physical layer) functionality while retransmissions of erroneous data is a Layer 2 (RLC, or Radio Link Control) functionality.

73. Hybrid ARQ is called “hybrid” because it combines functionality of Layer 1, the physical layer, and functionality of Layer 2, namely of the RLC.

74. As the patent further explains in the BACKGROUND section, data packets that are received but are detected to be erroneous are temporarily stored

and then combined with a retransmitted version of the same packet. This is sometimes referred to as “incremental combining.” EX1001 at 2:15-20.

75. Hybrid ARQ schemes were well known as far back as the earliest claimed priority date of August 2003. For example, a classic textbook on coding theory by Lin and Costello devotes section 15.4 to “HYBRID ARQ SCHEMES” (See EX1011, “Lin”, at pgs. 4-8). As Lin explains, a type of “hybrid ARQ scheme is devised based on the concept that the parity-check digits for error correction are sent to the receiver only when they are needed” (*Id* at pg. 6) and provide citations to references 18 and 19. Lin further teaches that “[v]arious hybrid ARQ schemes and their analysis can be found in References 17 to 29.” *Id* at pg. 8.

76. Below I provide the basic information related to some of the above mentioned references:

- a. Ref. 17: K. Brayer, “Error Control Techniques Using Binary Symbol Burst Codes”, April 1968.
- b. Ref. 18: D.M. Mandelbaum, “Adaptive-Feedback Coding Scheme Using Incremental Redundancy”, May 1974.
- c. Ref. 19: J.J. Metzner, “Improvements in Block Retransmission Schemes”, February 1979.
- d. Ref. 20: E.Y. Rocher and R.L. Pickholtz, “An Analysis of the Effectiveness of Hybrid Retransmission Schemes”, July 1970.

- e. Ref. 25: S. Lin and J.S. Ma, “A Hybrid ARQ System with Parity Retransmissions for Error Correction”, January 11, 1979.
- f. Ref. 26: S. Lin and P.S. Yu, “SPREC-An Effective Hybrid-ARQ Scheme”, April 4, 1979.

77. In conclusion, both handovers (including soft and softer) as well as H-ARQ schemes were well known for at least 20+ years before August 2003.

VI. THE '803 PATENT

A. Overview of the '803 Patent

78. I understand that the '803 patent is one of four issued U.S. patents, that claim priority to five U.S. provisional applications, U.S. Provisional Application Nos. 60/497,747 filed on Aug. 25, 2003; 60/507,554 filed on Oct. 1, 2003; 60/508,797 filed on Oct. 3, 2003; 60/520,207 filed on Nov. 14, 2003 and 60/585,174 filed on Jul. 2, 2004.

79. The application that led to the '803 patent was filed on August 6, 2019 and the '803 patent issued on September 1, 2020.

80. The three issued U.S. patents to which the '803 claims priority (which I will refer to as “parents”), in increasing chronological order, are:

1. US 8,023,463, filed on August 25, 2004, which issued on September 20, 2011. (EX1017, the '463 patent).

2. US 9,438,381, filed on September 19, 2011, which issued on September 6, 2016. EX1018, the '381 patent).
3. US 10,390,279, filed on July 18, 2016, which issued on August 20, 2019. EX1019, the '279 patent).

81. The '803 patent relates generally to wireless communication and more particularly to “an enhanced uplink (EU) operation during a soft handover.” EX1001 at 1:25, which is also the title of the three parent patents (See cover page of EX1017, EX1018, and EX1019, the '463, '381, '279 patents respectively). It is also instructive to consider the Abstract of each of the four patents in the family, as shown below:

82. Abstract of the '463 patent, filed in August 25, 2004:

(57) **ABSTRACT**

A method and system for an enhanced uplink (EU) operation in a wireless communication system during soft handover. The system comprises a wireless transmit/receive unit (WTRU), at least two Node-Bs, and a radio network controller (RNC). One Node-B may be designated as a primary Node-B, and the primary Node-B may control EU operation during soft handover including uplink scheduling and hybrid automatic repeat request (H-ARQ). Soft buffer corruption is avoided during soft handover by controlling H-ARQ by the primary Node-B. Alternatively, an RNC may control EU operation during soft handover including H-ARQ. In this case, an RNC generates final acknowledge/non-acknowledge (ACK/NACK) decision based on the error check results of the Node-Bs.

83. Abstract of the '381 patent, filed September 19, 2011:

(57)

ABSTRACT

A method and system for an enhanced uplink (EU) operation in a wireless communication system during soft handover. The system comprises a wireless transmit/receive unit (WTRU), at least two Node-Bs, and a radio network controller (RNC). One Node-B may be designated as a primary Node-B, and the primary Node-B may control EU operation during soft handover including uplink scheduling and hybrid automatic repeat request (H-ARQ). Soft buffer corruption is avoided during soft handover by controlling H-ARQ by the primary Node-B. Alternatively, an RNC may control EU operation during soft handover including H-ARQ. In this case, an RNC generates final acknowledge/non-acknowledge (ACK/NACK) decision based on the error check results of the Node-Bs.

84. Abstract of the '279 patent, filed July 18, 2016:

(57)

ABSTRACT

A method and system for an enhanced uplink (EU) operation in a wireless communication system during soft handover. The system comprises a wireless transmit/receive unit (WTRU), at least two Node-Bs, and a radio network controller (RNC). One Node-B may be designated as a primary Node-B, and the primary Node-B may control EU operation during soft handover including uplink scheduling and hybrid automatic repeat request (H-ARQ). Soft buffer corruption is avoided during soft handover by controlling H-ARQ by the primary Node-B. Alternatively, an RNC may control EU operation during soft handover including H-ARQ. In this case, an RNC generates final acknowledge/non-acknowledge (ACK/NACK) decision based on the error check results of the Node-Bs.

85. Abstract of the '803 patent, filed August 6, 2019:

(57) **ABSTRACT**

A method, wireless transmit/receive unit (WTRU), and a wireless network node configured for wireless communications comprising receiving, by the WTRU, configuration information for a primary cell and one or more non-primary cells, receiving, by the WTRU, a message on the primary cell, the received message including indication of at least one of the one or more non-primary cells from which the WTRU is to receive a downlink shared channel transmission, and in response to the received message, receiving and processing, by the WTRU, the downlink shared channel transmission from the indicated at least one of the one or more non-primary cells.

86. It is noteworthy that the three parent patents share the same Abstract in which there are at least the following three disclosures related to the purported invention: (i) “**enhanced uplink (EU)** operation in a wireless communication system **during soft handover**” (emphasis added) (ii) the “system comprises a wireless transmit/receive unit (WTRU), at least **two Node-Bs**” (emphasis added) and the system also comprises “a **radio network controller (RNC)**” (emphasis added). *Compare* EX1017 at Abstract, EX1018 at Abstract, and EX1019 at Abstract.

87. By contrast, the Abstract of the '803 patent, which was filed about 15 years after the original family member was filed, makes no mention of an

“enhanced uplink” or of a “handover” (“soft” or otherwise), or of “two Node-Bs”, or of an “RNC”. EX1001 at Abstract.

88. Similarly, the claims of the ’803 make no mention of “handover”, or an RNC, or a Node-B. The language in the claims does refer to the broader term “wireless network node”. Indeed, the broadening of the scope of the claims in the ’803 patent is not just limited to broadening one of the terms from “Node B” to “wireless network node”. Upon consideration of the Patent Owners Infringement Contentions (See EX1020) it becomes apparent that the language of the claims was broadened to encompass features that were present in LTE-advanced, also referred to as LTE-A. In their effort to broaden the claims, however, the claims are invalid as they also encompass the prior art, as I explain in section X below.

89. Returning to the disclosures of the ’803 patent, it describes an apparatus and method for EU operation during a soft handover in a wireless communication system, specifically one that included Node-Bs as well as an RNC, the UMTS system—also referred to as 3G-- being such a system.

90. While some embodiments relate to soft handover, there is an embodiment that involves softer handover, which is simply a subset of soft handovers, as I discussed above in section V.A. I discuss all of the embodiments disclosed in the ’803 patent below.

91. In the SUMMARY of the invention, the '803 patent explains that the “present invention is related to EU operation during a soft handover in a wireless communication system. The wireless communication system comprises a WTRU, at least two Node-Bs and an RNC.” EX1001 at 2:66-3:2. I note that this is precisely a portion of the abstract of the three parent patents, but not of the '803, as I discussed above.

92. The summary further states that in accordance with one embodiment of the invention, for each wireless transmit/receive unit (WTRU) one Node-B (base station) is designated as a primary Node-B and any other Node-B within the EU active set as a non-primary Node-B. The primary Node-B controls EU operation during soft handover including EU scheduling and hybrid automatic repeat request (H-ARQ). Soft buffer corruption is avoided by controlling H-ARQ during soft handover only by the primary Node-B. The patent also discloses that a radio network controller (RNC) may control EU operation during soft handover. In this case, an RNC generates the final ACK/NACK decision based on an error check results of the Node-Bs. EX1001 at 3:3-3:13. This embodiment involves two Node-Bs and an RNC with various different functions performed by the Node-Bs and by the RNC. The details of this embodiment (involving two Node-Bs) and various options within it are further discussed at 3:55-6:32.

93. With respect to this first embodiment, Fig. 1A (reproduced below) illustrates the components of the system.

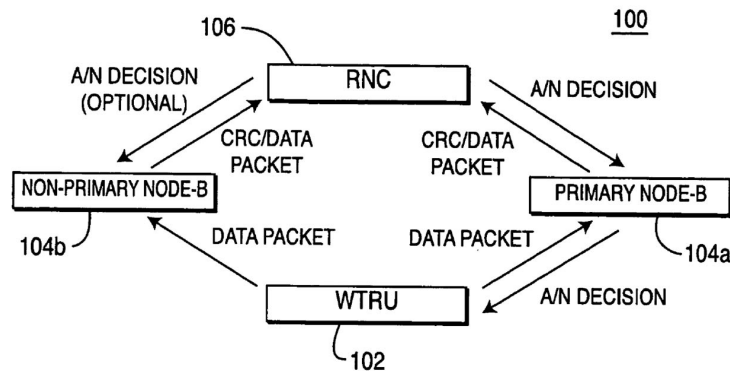


FIG. 1A

EX1001, FIG. 1

94. Fig. 1A includes a WTRU 102 having established connections with at least two cells controlled by different Node-Bs 104a and 104b. “Data packets transmitted from the WTRU 102 are received and processed separately by at least two Node- Bs 104 a, 104 b **during soft handover.**” EX1001 at 3:55-61 (emphasis added).

95. Similarly, Fig. 1B (reproduced below) illustrates the method steps for performing a soft handover in the context of the first embodiment. EX1001 at 3:55-5:12.

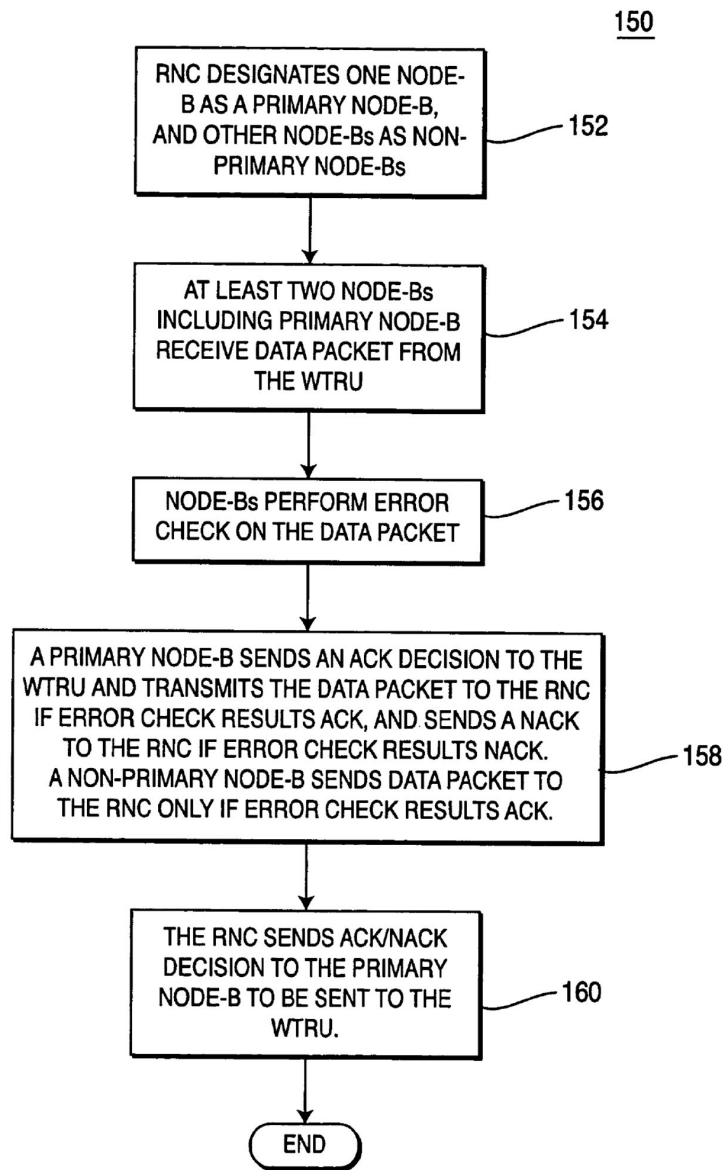


FIG. 1B

EX1001, FIG. 1B

96. Similarly, Figures 2A and 2B (reproduced below) “are diagrams of a system 200 and a process 250 of the second embodiment of the present invention.”

EX1001 at 6:33-35. In this second embodiment it is also the case that a WTRU “establishes connections with at least two cells controlled by **different Node-Bs 204a, 204b for soft handover...**” EX1001 at 6:40-42 (emphasis added).

97. The patent then goes on to provide the details of how combining the data packets received and processed by the different Node-Bs and how ACK/NACK signals are generated and transmitted to the WTRU. Said second embodiment is discussed at 6:33-7:2.

98. At 7:3-36 a third embodiment is discussed, which also involves at least two “**different Node-Bs 304a, 304b for soft handover.**” EX1001 at 7:5-7 (emphasis added).

99. A fourth embodiment is disclosed at 7:37-8:19. The fourth embodiment also involves a soft handoff and at least two different Node-Bs: “For **soft handover**, a WTRU 402 establishes a separate connection with at least two cells controlled by **different Node-Bs...**” EX1001 at 7:39-41 (emphasis added).

100. A fifth embodiment, discussed at 8:20-41, “is similar to the second embodiment, except that the Node-Bs 204a, 204b do not perform incremental combining during soft handover. A WTRU establishes connections with at least two cells controlled by **different Node-Bs 204a, 204b for soft handover.**” EX1001 at 8:21-26 (emphasis added). In other words, this embodiment, just as all the previous ones, require (1) soft handover and (2) at least two Node-Bs.

101. Another embodiment, the sixth one, though not labeled as being a “sixth embodiment” is disclosed at 8:42-9:32. Figures 8A and 8B are relevant to this embodiment as they “are diagrams of a system 800 and a process 850 for **softer handover** in accordance with the present invention. During **softer handover**, the WTRU 802 establishes connections with more than one cell 808 which are controlled by the same Node-B 804 (step 852).” EX1001 at 8:42-46 (emphasis added).

102. Figure 9 relates to “a system 900 for transferring WTRU-specific information to support EU operation 912 in accordance with the present invention. Initially, an RNC 906 obtains WTRU-specific information from a WTRU 902 using RRC messaging 908 at the initial connection. Then the WTRU-specific information is forwarded from the RNC 906 to a Node-B 904 to be used for scheduling EU transmissions for the WTRU 902.” EX1001 at 9:33-40.

103. In short, the disclosures provided with respect to Figure 9 at 9:33-48 relate to the interactions between a WTRU, a Node-B and an RNC.

104. In a similar manner, Figure 10 relates to “a diagram of a system 1000 for transferring information among network entities during soft handover in accordance with the present invention. During EU operation, if a WTRU 1002 needs to change the serving cell or the serving Node-B, a softer or soft handover procedure is initiated.” EX1001 at 9:49-54. The specifics of this aspect of the

“present invention” are disclosed at 9:49-10:30 and no other embodiments are disclosed.

105. In short, the patent discloses various embodiments for implementing EU operation during handover. All but one embodiment require at least two Node-Bs and/or an RNC consistent with the Title and the Abstract of the three parent patents. On the other hand, all of the claims of the '803 patent specifically require that there be one “network node”. Similarly, all of the embodiments are directed to operation during handover, much as the Title suggests.

106. It is apparent that when the application for the '803 patent was filed on August 6, 2019 i.e., about 16 years after the claimed priority date of August 25, 2003 the claims were drafted in an attempt to have them read on Carrier Aggregation which was introduced in LTE Advanced, with Release 10 of LTE-A. Specifically, patent owner points to TS 36.300 v10.6.0, TS36.321 v10.6.0, and TS36.331 v10.6.0 as providing evidence supporting their infringement allegations. See EX1020 at pg. 1.

107. As can be seen from the screen shots below, these Technical Specifications were published well before the filing date of the '803 patent.

108. Regarding TS36.300 v10.6.0, the “Upload date”, i.e., when it was available to the public, is December 22, 2011 (See Section IX.D):

Release 10(Spec is UCC for this Release)

Latest Remark: (2015-01-22) .


Meetings	Version	Upload date	Comment
RAN#66	10.12.0	2015-01-05	   
RAN#61	10.11.0	2013-09-19	   
RAN#60	10.10.0	2013-07-03	   
RAN#58	10.9.0	2013-01-08	   
RAN#56	10.8.0	2012-07-02	   
RAN#55	10.7.0	2012-03-14	   
RAN#54	10.6.0	2011-12-22	   
RAN#53	10.5.0	2011-10-03	   
RAN#52	10.4.0	2011-06-24	   
RAN#51	10.3.0	2011-04-05	   
RAN#50	10.2.0	2010-12-21	   
RAN#49	10.1.0	2010-10-04	   
RAN#48	10.0.0	2010-06-18	   

109. Regarding TS36.321 v10.6.0, the “Upload date”, i.e., when it was available to the public, is September 21, 2012 (See Section IX.E):

General	Versions	Responsibility	Related	Specification #: 36.321
Release 10(Spec is UCC for this Release)				Latest Remark: (2015-01-22) .
Meetings	Version	Upload date	Comment	
RAN#62	10.10.0	2014-01-07		 ETSI  TDoc  CR
RAN#60	10.9.0	2013-07-03		 ETSI  TDoc  CR
RAN#59	10.8.0	2013-03-18		 ETSI  TDoc  CR
RAN#58	10.7.0	2013-01-03		 ETSI  TDoc  CR
RAN#57	10.6.0	2012-09-21		 ETSI  TDoc  CR
RAN#55	10.5.0	2012-03-16		 ETSI  TDoc  CR
RAN#54	10.4.0	2011-12-21		 ETSI  TDoc  CR
RAN#53	10.3.0	2011-10-03		 ETSI  TDoc  CR
RAN#52	10.2.0	2011-06-24		 ETSI  TDoc  CR
RAN#51	10.1.0	2011-04-06		 ETSI  TDoc  CR
RAN#50	10.0.0	2010-12-21		 ETSI  TDoc  CR

110. Regarding TS36.331 v10.6.0, the “Upload date”, i.e., when it was available to the public, is July 3, 2012 (See Section IX.F):

General

Versions

Responsibility

Related

Specification #: 36.331

Meetings	Version	Upload date	Comment			
RAN#80	10.22.0	2018-07-08				
RAN#77	10.21.0	2017-09-25				
RAN#74	10.20.0	2016-12-30				
RAN#70	10.19.0	2016-01-04				
RAN#69	10.18.0	2015-09-25				
RAN#68	10.17.0	2015-07-08				
RAN#67	10.16.0	2015-03-23				
RAN#66	10.15.0	2015-01-05				
RAN#65	10.14.0	2014-09-23				
RAN#64	10.13.0	2014-07-03				
RAN#62	10.12.0	2014-01-07				
RAN#61	10.11.0	2013-09-19				
RAN#60	10.10.0	2013-07-04				
RAN#59	10.9.0	2013-03-22				
RAN#58	10.8.0	2013-01-07				
RAN#57	10.7.0	2012-09-26				
RAN#56	10.6.0	2012-07-03				
RAN#55	10.5.0	2012-03-14				
RAN#54	10.4.0	2011-12-22				

111. However, in their attempt to draft claims that patent owner claims read on Technical Specifications that had been developed at least about 7 years before their filing date (i.e., August 2019 filing date versus no later than September 2012 of the Technical Specifications), the claims were drafted so broadly as to encompass prior art, and thus are invalid. I provide the detailed invalidity analysis in section X below.

B. Priority date of the Challenged Claims of the '803 Patent

112. I understand that the applicable date of the Challenged Claims of the '803 patent for prior art purposes depends on whether the features recited in the Challenged Claims of the '803 Patent are described in the application or applications to which priority is claimed.

113. Claim 1 of the '803 patent recites “a primary cell is associated with a wireless network node and one or more non-primary cells are associated with the wireless network node,” and causing a WTRU to “receive configuration information for the primary cell and the one or more non-primary cells.” Although these limitations were submitted as part of the Abstract and original claims of the '320 application in 2019, they were not submitted in any of the parent priority applications. Nor do any of the parent applications describe the later-developed concept of carrier aggregation. The parent applications relate to earlier handover methods, and are silent on receiving configuration information for primary and non-primary cells.

114. The implementation of carrier aggregation requires additional data fields and processes, which are not present anywhere in the parent applications (or in the '803 patent specification). I understand that the patent owner, in its infringement contentions of the '803 patent (EX1020) from the related litigation *Pantech Corp. v. Oneplus Tech. (Shenzhen) Co., Ltd.*, 5:24-cv-00038-RWS-JBB

(E.D. Tex.), alleges that the relevant feature of claim 1 is met by a particular message from the series 36 Technical Specification TS36.331 (EX1010), namely the *RRCConnectionReconfiguration* message. See EX1020, pp. 11-17. As described in TS36.331, the *RRCConnectionReconfiguration* message:

is the command to modify an RRC connection. It may convey information for measurement configuration, mobility control, radio resource configuration (including RBs, MAC main configuration and physical channel configuration) including any associated dedicated NAS information and security configuration.

EX1010 at pg. 128. At no point does the specification of the '803 patent, or any of its parent priority applications, disclose or suggest any message containing “configuration information” (as claimed) similar or analogous to the above described *RRCConnectionReconfiguration* message.

115. The teachings of the specification of the '803 patent and its parent priority applications is entirely silent with respect to a mobile device receiving “configuration information for the primary cell and the one or more non-primary cells,” as required by claim 1 of the '803 patent. Indeed, the section of the specification of the '803 patent that is most relevant recites:

During softer handover, the WTRU 802 establishes connections with more than one cell 808 which are controlled by the same Node-B 804 (step 852). EU transmissions from the WTRU 802 are processed by each cell 808 independently (step 854), and each cell 808

transmissions received from the WTRU 802 are processed by the Node-B 804 controlling these cells (step 856).

EX1001 at 8:44-50.

116. Nowhere in this section, or in the remainder of the specification of the '803 patent or its parent priority patent applications, does it teach or suggest a WTRU receiving configuration information for the primary and non-primary cells, much less any structure whatsoever similar or analogous to the above discussed *RRCConnectionReconfiguration*. While the above quoted portion from the specification of the '803 patent and its parent priority patent applications does teach a WTRU establishing a connection with more than one cell, there is no teaching or suggestion of a WTRU specifically “receiving configuration information” for the more than once cell, as recited in claim 1 of the '803 patent.

117. Because the earliest instance in the '803 patent family history disclosing the receiving of configuration information for a primary cell and non-primary cells is with the filing of the '320 application on August 6, 2019, and the specification says nothing as to carrier aggregation, a POSITA would not have reasonably concluded the inventors were in possession of the full scope of the claimed invention prior to that date. Accordingly, the priority date of the claims of the '803 patent is no earlier than August 6, 2019.

C. The Prosecution History

118. I understand that the application leading to the '803 patent (i.e. U.S. Patent Application Serial No. 16/533,320) was filed on August 6, 2019, with seventeen original claims. EX1002 at 223-255. The application was a continuation in a chain of utility and provisional applications dating to 2003.

119. I understand that a non-final office action issued on September 27, 2019. EX1002 at pgs. 146–156. The office action rejected claims 1, 3, 4, 7, 9, 10, 13 for nonstatutory double patenting in view of the immediately preceding issued patent in the priority chain, U.S. Pat. No. 10,390,279. EX1002 at pg. 149. Claims 6, 12, and 17 were also rejected for nonstatutory double patenting in view of another patent in the chain, U.S. Pat. No. 9,438,381. EX1002 at pg. 150.

120. I further understand that claims 1, 7, and 13 were rejected under pre-AIA 35 U.S.C. 102(e) as being anticipated by Ranta-Aho et al. (U.S. Pat. 7,606,205). EX1002 at pg. 151. Claims 2, 5, 6, 8, 11, 12, 14, 15, 16, and 17 were rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ranta-Aho et al. (US pat.7,606,205) and further in view of Wu (U.S. Pub. 2003/0147370). EX1002 at 153.

121. I understand that on January 6, 2020, the Applicant filed a response to the office action. EX1002 at 102-121. In the response, the claims were not amended. Applicant argued that in Ranta-Aho “The BTSs or Node Bs receiving

the MBMS content then transmit the content using multicast messages to one or more terminals using via a common channel MBMS transmission, and the terminals compare pilot signals on a CPICH and perform selection of a common channel based on the result of the channel comparison.” EX1002 at pg. 110.

Further, “Although Ranta-Aho describes an architecture having multiple base stations or Node-Bs, Ranta-Aho is silent on the concept of a handset receiving configuration information for a primary cell and one or more or non-primary cells as recited in the pending independent claims.” EX1002 at pg. 112.

122. On January 30, 2020, I understand that a final office action was issued. The office action maintained the previous rejections. EX1002 at pgs. 75-87.

123. I understand that on May 29, 2020 a response to the office action was filed. EX1002 at pgs. 49-74. Claim 1 was amended to include “wherein the transceiver and the processor are configured to cause the WTRU to, while a primary cell is associated with a wireless network node and one or more non-primary cells are associated with the wireless network node”. Claim 7 and 13 were similarly amended. EX1002 at pgs. 56-61.

124. I understand that on June 10, 2020 a notice of allowance was issued. EX1002 at pg. 25. The patent issued on September 1, 2020. EX1001.

D. The Challenged Claims of the '803 Patent

125. The '803 patent includes seventeen claims. In this Declaration, I have considered the validity of claims 1, 2, 5, 6, 7, 8, 11, and 12. In my opinion, claims 1, 2, 5, and 6 as well as 7, 8, 11, and 12 of the '803 patent are unpatentable as being obvious in view of the prior art references discussed below.

126. Claims 1, 2, 5, 6, 7, 8, 11, and 12 are set forth below with annotations identifying the various elements of the claims.

Element	Claim
[1pre]	1. A wireless transmit/receive unit (WTRU) comprising:
[1a]	a transceiver; and
[1b]	a processor; and
[1c]	wherein the transceiver and the processor are configured to cause the WTRU to, while a primary cell is associated with a wireless network node and one or more non-primary cells are associated with the wireless network node:
[1d]	receive configuration information for the primary cell and the one or more non-primary cells;
[1e]	receive a message on the primary cell, the received message including an indication of at least one of the one or more non-primary cells from which the WTRU is to receive a downlink shared channel transmission; and

Element	Claim
[1f]	in response to the received message, receive and process the downlink shared channel transmission from the indicated at least one of the one or more non-primary cells.
[2a]	The WTRU of claim 1
[2b]	wherein there is a time delay between the downlink shared channel transmission and the receipt of the message by the WTRU.
[5a]	5. The WTRU of claim 1
[5b]	5. wherein the transceiver and the processor are further configured to cause the WTRU to receive a grant for an uplink transmission from the primary cell
[5c]	and to transmit the uplink transmission based on the received grant.
[6a]	6. The WTRU of claim 5
[6b]	wherein the transceiver and the processor are further configured to cause the WTRU to process an acknowledgement/negative acknowledgement to the uplink transmission received only from the primary cell.
[7pre]	A method comprising:
[7a]	receiving, by a wireless transmit/receive unit (WTRU), configuration information for a primary cell and one or more

Element	Claim
	non-primary cells, wherein the primary cell is associated with a wireless network
[7b]	receiving, by the WTRU, a message on the primary cell, the received message including indication of at least one of the one or more non-primary cells from which the WTRU is to receive a downlink shared channel transmission
[7c]	in response to the received message, receiving and processing, by the WTRU, the downlink shared channel transmission from the indicated at least one of the one or more non-primary cells.
[8a]	The method of claim 7 wherein there is a time delay between the downlink shared channel transmission and the receipt of the message by the WTRU.
[11]	The method of claim 7 further comprising receiving, by the WTRU, a grant for an uplink transmission from the primary cell and transmitting, by the WTRU, the uplink transmission based on the received grant.
[12]	The method of claim 11 further comprising processing, by the WTRU, an acknowledgement/negative acknowledgement to the uplink transmission received only from the primary cell.

VII. LEVEL OF ORDINARY SKILL IN THE ART

127. In my opinion and based upon my background and experience, the level of skill of a POSITA in the timeframe prior to August 25, 2003, would have been met by a person who would have had a B.S. in Electrical Engineering or a related field with at least three years of experience designing, developing, and/or testing telecommunication systems. A POSITA would also have familiarity with the wireless standards and well-known protocols for accessing wireless networks. In my opinion, additional education could substitute for professional, practical experience and vice versa. In my opinion, the Challenged Claims of the '803 patent are unpatentable as being obvious in view of the prior art references discussed herein from the perspective of a person with any other level of ordinary skill that is reasonable.

VIII. CONSTRUCTION OF CLAIM TERMS

128. For purposes of the Declaration, it is my understanding that I am to interpret the claim language according to its ordinary and customary meaning that it would have to a POSITA as of the priority date of the Challenged Claims of the '803 patent in the context of the entire patent disclosure. It is my understanding that, in interpreting the claim language, I am to take into consideration the teachings of the patent specification and any relevant prosecution history.

129. With respect to the claim terms of the Challenged Claims, I have applied their plain and ordinary meaning and/or have applied my understanding of how Patent Owner has applied the Challenged Claims in the co-pending district court litigation asserting infringement of the '803 patent. In my opinion, the Challenged Claims of the '803 patent are unpatentable in view of the prior art references discussed below under any reasonable interpretation of the claim terms, including their plain and ordinary meaning and including the manner in which Patent Owner has applied these claims.

IX. OVERVIEW OF THE PRIOR ART

A. Ericsson (R2-020088) (EX1005)

130. R2-020088 is a Technical Document (TDoc) submitted by Ericsson in Meeting #26 of RAN Working Group 2 held in Sophia Antipolis, France, in January 2002. As I discussed above in section V.B, these TDocs are published by the 3rd Generation Partnership Project (3GPP). Specifically, this TDoc (EX1005, "Ericsson") was publicly available on January 4, 2002. EX1004 at pgs. 27-32. I understand that R2-020088 qualifies as prior art to the Challenged Claims of the '803 patent under at least pre-AIA 35 U.S.C. § 102(a) because it is a printed publication that published before the earliest priority date of August 25, 2003, of the '803 patent.

131. Ericsson discloses exemplary mobility procedures for user equipment (UE) with High-Speed Downlink Shared Channel (HS-DSCH) assignments in a mobile network, specifically a UMTS network as discussed in, for example, 3GPP TS 25.303 and/or 3GPP TS 25.308, as referenced by Ericsson. The '803 patent also discusses the purported invention in the context of a UMTS network.

132. Ericsson describes how serving HS-DSCH cell changes can be managed.

133. For example, Ericsson discloses that the serving HS-DSCH cell is changed without changing the active set of assignments.

Section 2 includes a discussion of some important mobility aspects. In Section 3 of this contribution, we consider the following examples:

Intra-Node B synchronised serving HS-DSCH cell change:

The serving HS-DSCH cell is changed without change of the active set. The same Node B controls source and target HS-DSCH cells.

EX1005 at pg. 1.

134. Ericsson further discloses “an intra-Node B serving HS-DSCH cell change while keeping the dedicated physical channel configuration and the active set, using the Physical channel reconfiguration procedure. The transition from source to target HS-DSCH cell is performed synchronised, i.e. at a given activation time.” EX1005 at pg. 4.

135. As part of this process, “The SRNC then sends a PHYSICAL CHANNEL RECONFIGURATION message, which indicates the target HS-DSCH cell and the activation time to the UE.” EX1005 at pg. 4.

136. The process is illustrated in Ericsson Figure 3 (reproduced below).

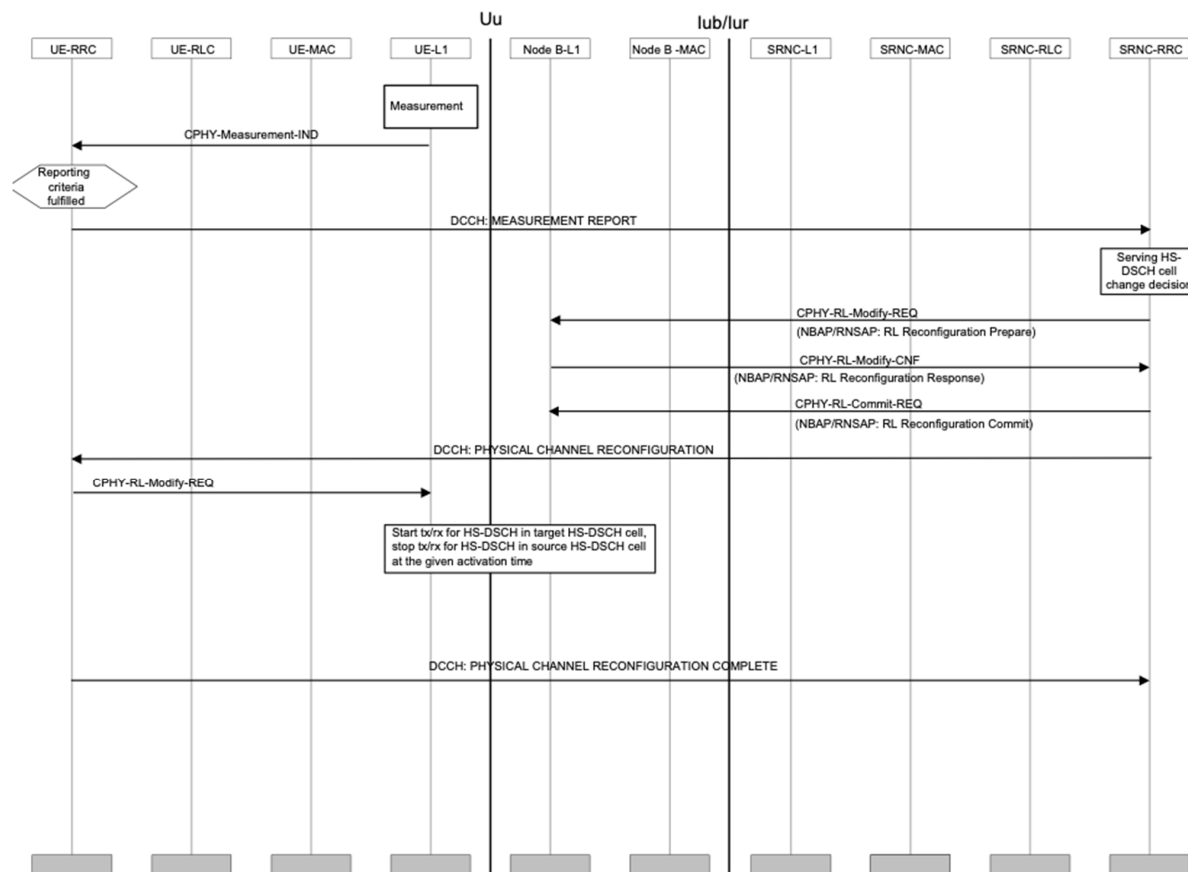


Figure 3: Intra-Node B synchronised serving HS-DSCH cell change

EX1005 at pg. 5.

137. Thus, Ericsson discloses “Intra-Node B... cell change”, i.e., a procedure by which a change from a source HS-DSCH cell to a target HS-DSCH cell while both are associated with the same Node-B. EX1005 at, *e.g.*, pg. 1

138. As can be seen in Figure 3, a “PHYSICAL CHANNEL RECONFIGURATION” message is transmitted to the mobile device (UE) on the DCCH, which stands for the Dedicated Control Channel. Said message originates at the Radio Resource Control (RRC) layer of the protocol at the SRNC, i.e., the “Serving Radio Network Controller” or “Serving RNC” and transmitted to the UE by the Node-B. A POSITA would understand the above based on the known architecture of UMTS as shown, for example, in Holma (EX1016 at pg. 4):

5.2 UTRAN Architecture

UTRAN architecture is highlighted in Figure 5.3.

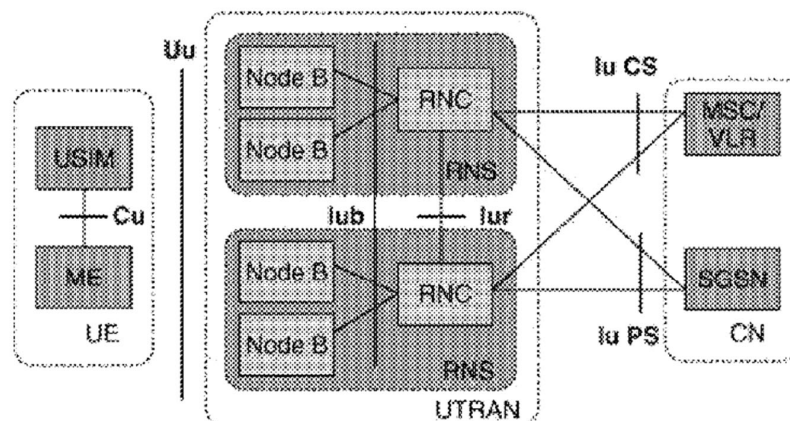


Figure 5.3. UTRAN architecture

B. TS25.331 (EX1006)

139. TS25.331 (EX1006) is a technical specification TS 25.331 V5.5.0 published by 3GPP. I understand that it was publicly accessible as of June 24, 2003. EX1004 at pgs. 32-41. I further understand that TS25.331 qualifies as prior art to the '803 patent under at least pre-AIA 35 U.S.C. § 102(a) (pre-AIA).

140. TS25.331 “specifies the Radio Resource Control protocol for the UE-UTRAN radio interface.” EX1006 at pg. 27.

141. The Radio Resource Control (abbreviated as RRC) protocol specifies all the procedures and related messages that are relevant to the communication between a UE and the UMTS network, a Node-B in particular. Thus, in the 900+ pages of this specification all the details of each message are included and procedures that must be followed by a UE upon reception of a corresponding message.

142. As shown in the portion of the Table of Contents below, there are about 100 messages that relate to the RRC, wherein I have highlighted just one, the PHYSICAL CHANNEL RECONFIGURATION message as an example:

10.2	Radio Resource Control messages	321
10.2.1	ACTIVE SET UPDATE	321
10.2.2	ACTIVE SET UPDATE COMPLETE	322
10.2.3	ACTIVE SET UPDATE FAILURE	322
10.2.4	ASSISTANCE DATA DELIVERY	323
10.2.5	CELL CHANGE ORDER FROM UTRAN	324
10.2.6	CELL CHANGE ORDER FROM UTRAN FAILURE	325
10.2.7	CELL UPDATE	325
10.2.8	CELL UPDATE CONFIRM	326
10.2.9	COUNTER CHECK	329
10.2.10	COUNTER CHECK RESPONSE	330
10.2.11	DOWNLINK DIRECT TRANSFER	330
10.2.12	Void	331
10.2.13	Void	331
10.2.14	Void	331
10.2.15	HANDOVER FROM UTRAN COMMAND	331
10.2.16	HANDOVER FROM UTRAN FAILURE	333
10.2.16a	HANDOVER TO UTRAN COMMAND	333
10.2.16b	HANDOVER TO UTRAN COMPLETE	336
10.2.16c	INITIAL DIRECT TRANSFER	337
10.2.16d	INTER RAT HANDOVER INFO	337
10.2.17	MEASUREMENT CONTROL	338
10.2.18	MEASUREMENT CONTROL FAILURE	339
10.2.19	MEASUREMENT REPORT	340
10.2.20	PAGING TYPE 1	341
10.2.21	PAGING TYPE 2	341
10.2.22	PHYSICAL CHANNEL RECONFIGURATION	342
10.2.23	PHYSICAL CHANNEL RECONFIGURATION COMPLETE	343
10.2.24	PHYSICAL CHANNEL RECONFIGURATION FAILURE	344
10.2.25	PHYSICAL SHARED CHANNEL ALLOCATION	345
10.2.26	PUSCH CAPACITY REQUEST	346
10.2.27	RADIO BEARER RECONFIGURATION	347
10.2.28	RADIO BEARER RECONFIGURATION COMPLETE	350
10.2.29	RADIO BEARER RECONFIGURATION FAILURE	351
10.2.30	RADIO BEARER RELEASE	352
10.2.31	RADIO BEARER RELEASE COMPLETE	355
10.2.32	RADIO BEARER RELEASE FAILURE	356
10.2.33	RADIO BEARER SETUP	356
10.2.34	RADIO BEARER SETUP COMPLETE	360
10.2.35	RADIO BEARER SETUP FAILURE	361
10.2.36	RRC CONNECTION REJECT	361
10.2.37	RRC CONNECTION RELEASE	362
10.2.38	RRC CONNECTION RELEASE COMPLETE	364
10.2.39	RRC CONNECTION REQUEST	364
10.2.40	RRC CONNECTION SETUP	365
10.2.41	RRC CONNECTION SETUP COMPLETE	368
10.2.41a	RRC FAILURE INFO	368

10.2.42	RRC STATUS.....	369
10.2.43	SECURITY MODE COMMAND.....	369
10.2.44	SECURITY MODE COMPLETE.....	370
10.2.45	SECURITY MODE FAILURE.....	371
10.2.46	SIGNALLING CONNECTION RELEASE.....	371
10.2.47	SIGNALLING CONNECTION RELEASE INDICATION.....	372
10.2.48	SYSTEM INFORMATION.....	372
10.2.48.1	First Segment.....	374
10.2.48.2	First Segment (short).....	374
10.2.48.3	Subsequent Segment.....	374
10.2.48.4	Last Segment.....	375
10.2.48.5	Last Segment (short).....	375
10.2.48.6	Complete SIB.....	375
10.2.48.7	Complete SIB (short).....	376
10.2.48.8	System Information Blocks.....	376
10.2.48.8.1	Master Information Block.....	376
10.2.48.8.2	Scheduling Block 1.....	377
10.2.48.8.3	Scheduling Block 2.....	377
10.2.48.8.4	System Information Block type 1.....	377
10.2.48.8.5	System Information Block type 2.....	378
10.2.48.8.6	System Information Block type 3.....	378
10.2.48.8.7	System Information Block type 4.....	379
10.2.48.8.8	System Information Block type 5.....	379
10.2.48.8.9	System Information Block type 6.....	380
10.2.48.8.10	System Information Block type 7.....	381
10.2.48.8.11	System Information Block type 8.....	381
10.2.48.8.12	System Information Block type 9.....	382
10.2.48.8.13	System Information Block type 10.....	382
10.2.48.8.14	System Information Block type 11.....	382
10.2.48.8.15	System Information Block type 12.....	383
10.2.48.8.16	System Information Block type 13.....	383
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10.2.48.8.16.2	System Information Block type 13.2.....	384
10.2.48.8.16.3	System Information Block type 13.3.....	384
10.2.48.8.16.4	System Information Block type 13.4.....	384
10.2.48.8.17	System Information Block type 14.....	384
10.2.48.8.18	System Information Block type 15.....	385
10.2.48.8.18.1	System Information Block type 15.1.....	385
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10.2.51	TRANSPORT CHANNEL RECONFIGURATION COMPLETE.....	391
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10.2.53	TRANSPORT FORMAT COMBINATION CONTROL.....	393
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10.2.61	URA UPDATE CONFIRM.....	398
10.2.62	UTRAN MOBILITY INFORMATION.....	399
10.2.63	UTRAN MOBILITY INFORMATION CONFIRM.....	400
10.2.64	UTRAN MOBILITY INFORMATION FAILURE.....	401

EX1006 at pgs. 12-13.

143. In short, the specific ways of the network informing a UE of any changes in the organization of the radio resources used for communicating between the network and the UE were well established at the time of the alleged invention.

C. Sebire (EX1007)

144. Sebire is a WIPO international publication of PCT application PCT/IB02/04293. Sebire published in English on April 24, 2003, and is thus available as prior art under at least 35 U.S.C. § 102(a) (pre-AIA). EX1007.

145. Sebire discloses handover-related issues in GPRS, a system that was based on GSM and was developed after GSM. It is a system that provided data communication capabilities, which the original GSM system essentially did not provide for. While Sebire's focus is on handover, similar to the focus of the '803 patent, it discloses additional aspects that are relevant to the operation of a wireless communications system, such as the UMTS system.

D. TS36.300 (EX1008)

146. TS36.300 (EX1008) is a technical specification TS 36.300 V10.6.0 published by 3GPP and publicly accessible as of December 20, 2011. EX1004 at pgs. 44-55. Thus, TS36.300 qualifies as prior art to at least claims 1, 5 and 6 of the '803 patent under at least 35 U.S.C. § 102(a)(1) (AIA), if those claims are accorded their proper filing date.

147. TS36.300 is directed to E-UTRAN radio interface implementing Carrier Aggregation (CA) for a LTE-A radio communication system. TS36.300 “shows . . . deployment scenarios for CA.” EX1008 at pg. 184. Patent Owner relied on TS36.300 in alleging infringement of claims 1, 5, and 6 of the ’803 patent by certain accused devices of Petitioner in pending case *Pantech Corp. v. Oneplus Tech. (Shenzhen) Co., Ltd.*, 5:24-cv-00038-RWS-JBB (E.D. Tex.). See EX1020 at, e.g., pg. 1.

E. TS36.321 (EX1009)

148. TS36.321 (EX1009) is a technical specification TS 36.321 V10.6.0 published by 3GPP and publicly accessible as of September 21, 2012. EX1004 at pgs. 56-67. Thus, TS36.321 qualifies as prior art to at least claims 1, 5 and 6 of the ’803 patent under at least 35 U.S.C. § 102(a)(1) (AIA), if those claims are accorded their proper filing date.

149. TS36.321 is directed to E-UTRA MAC protocol for a Long-Term-Evolution-Advanced (LTE-A) radio communication system. EX1009 at pg. 6. TS36.321 teaches “[i]f the UE is configured with one or more SCells, there are multiple DL-SCH and there may be multiple UL-SCH per UE; one DL-SCH and UL-SCH on the PCell, one DL-SCH and zero or one UL-SCH for each SCell.” EX1009 at pg. 9. I understand that the Patent Owner relied on TS36.321 in alleging infringement of claims 1, 5, and 6 of the ’803 patent by certain accused

devices of Petitioner in pending case *Pantech Corp. v. Oneplus Tech. (Shenzhen) Co., Ltd.*, 5:24-cv-00038-RWS-JBB (E.D. Tex.). EX1020 at, *e.g.*, pg. 1.

F. TS36.331 (EX1010)

150. TS36.331 (EX1010) is a technical specification TS 36.331 V10.6.0 published by 3GPP and publicly accessible as of July 2, 2012. EX1004 at pgs. 68-79. Thus, TS36.331 qualifies as prior art to at least claims 1, 5 and 6 of the '803 patent under at least 35 U.S.C. § 102(a)(1) (AIA), if those claims are accorded their proper filing date.

151. TS36.331 “specifies the Radio Resource Control protocol for the radio interface between UE and E-UTRAN.” EX1010 at pg. 14. In relevant part, TS36.331 teaches that “the PCell can be changed using an *RRCCConnectionReconfiguration* message including the *mobilityControlInfo* (handover), whereas the SCell(s) can be changed using the *RRCCConnectionReconfiguration* message with or without the *mobilityControlInfo*.” EX1010 at pg. 35. I understand that Patent Owner relied on TS36.331 in alleging infringement of claims 1, 5, and 6 of the '803 patent by certain accused devices of Petitioner in pending case *Pantech Corp. v. Oneplus Tech. (Shenzhen) Co., Ltd.*, 5:24-cv-00038-RWS-JBB (E.D. Tex.). EX1020 at, *e.g.*, pg. 1.

X. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Ground 1: The Combination of TS36.300, TS36.321 and TS36.331

152. It would have been obvious to a POSITA prior to the earliest possible priority date of the '803 patent to combine TS36.300, TS36.321 and TS36.331.

153. In my opinion, a POSITA would have been motivated to combine 3GPP Technical Specifications TS36.300, TS36.321, and TS36.331 because they each address different, yet complementary, aspects of the same telecommunications standard developed by 3GPP for governing cellular radio communications. More specifically, these specifications collectively describe various components of the radio interface between user equipment ("UE") and the Evolved Universal Terrestrial Radio Access Network ("E-UTRAN"). These documents are not only part of a cohesive standard but also explicitly cross-reference and incorporate one another. For example, TS36.331 expressly references TS36.300 and TS36.321. See EX1010 at pg. 14 ("The following documents...constitute provisions of the present document. ... [6] 3GPP TS 36.321 ... [9] 3GPP TS 36.300...").

154. Given the interrelated nature of the specifications and their role in defining telecommunications protocols, a POSITA would have understood the need to consult and apply all three specifications (in addition to others) in combination to implement the standard. A POSITA would also have had a

reasonable expectation of success in doing so, as demonstrated by the widespread industry adoption of the 3GPP standard by multiple vendors.

B. Ground 2: Claims 1, 2, 5, 6, 7, 8, 11, and 12 Would Have Been Obvious in View of Ericsson, TS25.331 and Knowledge of a POSITA

155. In my opinion, claims 1, 2, 7, and 8 of the '803 patent would have been obvious in view of Ericsson and TS25.331 and claims 5, 6, 11, and 12 would have been obvious under Section 103 over Ericsson in view of TS25.331 in further view of knowledge of a POSITA.

1. The Ericsson and TS25.331 Combination

156. It would have been obvious to a POSITA prior to the earliest possible priority date of the '803 patent to combine Ericsson and TS25.331 to arrive at the subject matter of claims 1, 2, 7, and 8.

157. A POSITA would have been motivated to combine Ericsson and TS25.331 because they are directed to similar technologies and a skilled artisan would have understood the benefits of combining these references. A POSITA would have understood that there was a high likelihood of success in making the combination.

158. Each of Ericsson and TS25.331 is analogous art with respect to the '803 patent. Ericsson and TS25.331 are both in the same field of endeavor as the challenged claims of the '803 patent and are both reasonably pertinent to the

problem faced by the inventor, namely operation during a soft handover. *Compare* EX1001, at (i) 2:66-67, (ii) 3:55-59, (iii) 6:40-43, (iv) 7:3-9, (v) 7:39-41, (vi) 8:20-24, and (vii) 8:42-50 with EX1005 at pg. 1 (“The serving HS-DSCH cell is changed without change of the active set. The same Node B controls source and target HS-DSCH”), pgs. 4-5 (section 3.1) and with EX1006 at pgs. 175-176 (Section 8.3.5), pg. 192 (“the cells in the active set are involved in soft handover”) (EX1006 at pg. 192), and pg. 392 (“RRC Connection mobility is handled by measurement reporting, soft handover and Timing re-initialized or Timing-maintained hard handover procedures.”).

159. Ericsson and TS25.331 are readily combinable because both references are directed to operation during handover. It therefore would have been obvious to a POSITA to apply advantageous teachings of the TS25.331 specification with the teachings of Ericsson.

160. Ericsson and TS25.331 are readily combinable because both references are directed to protocols for a radio interface between user equipment and base stations (UMTS). It would have been obvious to a POSITA to apply advantageous teachings of Ericsson within TS25.331’s specification.

161. A POSITA would have been motivated to use and configure the TS25.331 specification following the handover technique described in Ericsson.

162. For example, Ericsson describes mobility procedures for user equipment (UE) with High-Speed Downlink Shared Channel (HS-DSCH) assignments in a mobile network. Ericsson describes procedures that can be used when serving HS-DSCH cell changes can be performed. EX1005 at, *e.g.*, pg. 1.

163. TS25.331 describes a message structure that can be advantageously used during mobility procedures for user equipment (UE) with High-Speed Downlink Shared Channel (HS-DSCH) assignments in a mobile network.

164. A POSITA would have been motivated to implement the processes described in Ericsson in accordance and consistent with the specifications detailed in TS25.331. Ericsson describes the use of event 1D-triggered Measurement Reports transmitted from a User Equipment (UE) to a Node B during an “intra-Node B serving HS-DSCH cell change.” EX1005 at pg. 4. The TS25.331 UMTS Technical Specifications, provides comprehensive definitions and protocols related specifically to event 1D-based triggering mechanisms. See EX1006 at pgs. 190-194, 314-328. Thus, given Ericsson’s explicit reference to event 1D-based triggering, a POSITA would have naturally consulted TS25.331 for guidance in implementing such processes as detailed by Ericsson.

165. A skilled artisan would have combined Ericsson and TS25.331 and would have had a reasonable expectation of success in doing so as the concept of uplink operation during handover was known in the art and was acknowledged as

such in the specification of the '803 patent itself. EX1001 at 1:34-39. Because Ericsson identifies a problem and provides express guidance on how to fix the problem, a skilled artisan would have had a reasonable expectation of success in combining the prior art. The combination of Ericsson and TS25.331 is merely the predictable use of interchangeable prior art elements according to their established functions. This combination is not of innovation but of ordinary skill and common sense. Accordingly, the combination of Ericsson and TS25.331 renders claims 1, 5 and 6 of the '803 patent obvious.

166. A POSITA would have been motivated to combine the teachings of Ericsson and TS25.331, and would reasonably expect success in doing so, as the concept of an intra-Node B serving HS-DSCH cell change was well-established and even acknowledged by the '803 patent itself. EX1001, 1:34-49. The prior art explicitly identifies a known issue and provides clear instructions on addressing it. A POSITA would have found combining these references both logical and predictable. The integration of Ericsson and TS25.331 represents the straightforward application of established elements within their known functions, reflecting ordinary technical skill and common sense rather than inventive ingenuity. Consequently, this combination renders claims 1 and 7 of the patent obvious.

167. Additionally, combining Ericsson and TS25.331 would have produced predictable outcomes through straightforward and routine engineering efforts. Ericsson specifically describes an intra-Node B serving HS-DSCH cell change triggered by an event 1D change of best cell event, while TS25.331 provides detailed guidance regarding the structure and operational details of such event 1D changes. Consequently, a skilled artisan already familiar with Ericsson would have merely needed to consult TS25.331 for comprehensive details to implement the intra-Node B serving HS-DSCH cell change effectively. This integration was fully within the technical grasp of a skilled artisan before the earliest potential priority date of the patent in question. Ericsson itself implicitly endorses this approach by explicitly linking intra-frequency measurement reports used for triggering intra-Node B cell changes to event 1D changes in best cell events. Thus, a skilled artisan would have recognized this combination as straightforward, likely to succeed, and therefore obvious.

168. Importantly, a POSITA would have found it obvious, and would have been motivated, to use and modify the TS25.331 specification following the teachings of Ericsson since the very reason for the existence of this Technical Document (“TDoc”) is to provide updates to TS25.331, as I detail below.

169. As I discussed above in Section V.B, 3GPP is organized into TSGs (Technical Specification Groups) and each TSG is organized into working groups,

WG. Specifically, as shown in the screen shot below, the TSG RAN (i.e., Radio Access Network) is responsible for the Technical Specification TS25.331, with “Secondary responsible group” being RAN 2, i.e., WG 2 of RAN:

portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=1180

3GPP Portal
A GLOBAL INITIATIVE

General Versions Responsibility Related **Specification #: 25.331**

Primary responsible group: RAN
Secondary responsible groups: RAN 2

Rapporteurs

Name	Company
<u>Ritesh Shreevastav</u>	Ericsson India Private Limited

170. Furthermore, Ericsson is a TDoc submitted in Meeting #26 of “3GPP TSG-RAN WG2” as is shown in the heading of Ericsson, as shown below:

3GPP TSG-RAN WG2#26
Sophia Antipolis, France, January 7 – 11, 2002

R2-020088

EX1005 at pg. 1.

171. In other words, a POSITA would have known that the relevant working group for the continued development of TS25.331 was “RAN 2”, i.e., working group #2 of the RAN TSG.

172. In addition to the above, Ericsson makes numerous references to various messages, e.g., a “MEASUREMENT REPORT message”, a “PHYSICAL CHANNEL RECONFIGURATION message”, a “PHYSICAL CHANNEL

RECONFIGURATION COMPLETE message” (See EX1005 at pg. 4) all of which are Layer 3 messages defined in TS25.331.

173. In short, the very reason for the existence of Ericsson is to incorporate its teachings into TS25.331 as well as other relevant Technical Specifications. A POSITA would have known that the contents of Ericsson were written by a group of peers to provide suggestions for modifying the disclosure of TS25.331 in subsequent iterations of the specification and therefore include “self-executing” reasons to combine that have been carefully scrutinized to confirm the suitability of modifying TS25.311 as proposed in the TDoc.

174. Additionally, the combination of TS25.331 and Ericsson would have yielded predictable results and required nothing more than routine engineering. TS25.331 teaches the structure of RRC messages and their use, while Ericsson teaches specific details about mobility examples, which include handovers, as shown by its title, “Mobility examples when the UE has an HS-PDSCH assignment” disclosing a number of mobility procedures. Thus, a POSITA, in order to incorporate Ericsson’s teachings into TS25.331’s specification, would have only needed to add some of the teachings from Ericsson into the TS25.331 specification for use of the RRC. A POSITA would have understood that this modification was vetted by the “Primary responsible group” for the continued development of TS25.331, had a high likelihood of success, and was obvious.

2. Independent Claim 1

175. The combination of Ericsson and TS25.331 renders claim 1 obvious under Section 103.

(a) [1pre] A wireless transmit/receive unit (WTRU) comprising:

176. Ericsson discloses a wireless transmit/receive unit (WTRU) recited in Element [1pre]. For example, the title of Ericsson is “Mobility examples when the UE has an HS-PDSCH assignment.” Ex1005 at pg. 1, Title.

177. Ericsson refers to the term “UE” as a mobile device within the context of the relevant telecommunications standards being discussed throughout the disclosure of Ericsson. EX1005 at pgs. 1-5. UE stands for user equipment. The term “User Equipment,” abbreviate as “UE,” is standard terminology in the telecommunications industry and is synonymous with WTRU and mobile station, each of which are abbreviations or other names for a cellular device or phone.

178. Further, the introduction of Ericsson states “In [1], a categorisation of mobility related concepts and procedures have been proposed. This contribution illustrates a selection of these procedures as signaling message sequence examples.” Ex1005 at pg. 1. A person of skill would understand that mobility related signaling necessarily uses a wireless transmit/receive unit (WTRU).

179. Accordingly, Ericsson discloses Element [1pre].

(b) [1a] a transceiver; and

180. Ericsson discloses a transceiver as recited in Element [1a]. As discussed with respect to Element [1pre], Ericsson discloses, a wireless transmit/receive unit (WTRU) in both the title and introduction. These same sections also disclose a transceiver.

181. A POSITA would understand a “transceiver” as an abbreviation for transmitter/receiver. A transceiver is a fundamental element of a UE and is used to transmit and receive information for communication with a base station (i.e., a Node B of Ericsson, referenced repeatedly at EX1005 at pgs. 1-5).

182. For example, the introduction of Ericsson states “In [1], a categorisation of mobility related concepts and procedures have been proposed. This contribution illustrates a selection of these procedures as signalling message sequence examples.” Ex1005 at pg. 1. A person of ordinary skill would understand that mobility related signaling necessarily uses a transceiver. Ericsson further states “Intra-Node B synchronized serving HS-DSCH cell change.” EX1005 at pg. 1. In this process, the UE changes a “serving HS-DSCH cell ... without change of the active set,” where “[t]he same Node B controls source and target HS-DSCH cells.” *Id.*

183. Accordingly, Ericsson discloses Element [1a].

(c) [1b] a processor; and

184. Ericsson discloses a processor. As discussed above with respect to Elements [1pre] and [1a], the title of Ericsson is “Mobility examples when the UE has an HS-PDSCH assignment.” Ex1005 at pg. 1, Title.

185. A person skilled in the art would recognize a “processor” as a fundamental component of a User Equipment (UE), consistent with Ericsson's disclosures. In Ericsson, the processor handles, among other functions, the processing of data intended for transmission via the transceiver and similarly processes incoming data received by the transceiver. Thus, all data exchanged by the UE, whether sent or received, is managed through a processor component within the UE architecture described by Ericsson.

186. Further, the introduction of Ericsson states “In [1], a categorisation of mobility related concepts and procedures have been proposed. This contribution illustrates a selection of these procedures as signalling message sequence examples.” Ex1005 at pg. 1. This is also made clear in Figure 3 wherein the UE includes functions labeled “UE-L1”, “UE-MAC”, “UE-RLC” and “UE-RRC”. A POSITA would understand that these stand for functions performed by “Layer 1”, those performed by the MAC sublayer of Layer 2, those performed by the RLC sublayer of Layer 2 and those performed by the RRC Layer (a Layer 3 protocol) respectively. A POSITA would understand that these functions are performed by a

processor. Thus, a POSITA would understand that mobility related signaling necessarily uses a processor.

187. Accordingly, Ericsson discloses Element [1b].

(d) **[1c] wherein the transceiver and the processor are configured to cause the WTRU to, while a primary cell is associated with a wireless network node and one or more non-primary cells are associated with the wireless network node:**

188. Ericsson discloses that the transceiver and the processor are configured to cause the WTRU to perform the tasks in the subsequent Elements, while a primary cell is associated with a wireless network node and one or more non-primary cells are associated with the wireless network node.

189. For example, Ericsson discloses “In [1], a categorisation of mobility related concepts and procedures have been proposed. This contribution illustrates a selection of these procedures as signalling message sequence examples. The message sequences are very similar to the sequences presently given in TS 25.303 and TS 25.931 for ordinary DCH handover cases.” Ex1005 at pg. 1.

190. Further, Ericsson discloses “Section 2 includes a discussion of some important mobility aspects. In Section 3 of this contribution, we consider the following examples: Intra-Node B synchronised serving HS-DSCH cell change: The serving HS-DSCH cell is changed without change of the active set. The **same Node B controls source and target HS-DSCH cells.**” Ex1005 at pg. 1 (emphasis

added). The “active set” of Ericsson describes a set of cells controlled by the “same Node B” and are therefore associated with the same Node B, i.e., associated with the wireless network node as the claim element requires.

191. In section 3, Ericsson discusses intra-Node B synchronised serving HS-DSCH cell change. Ex1005 at 4. Ericsson states “Figure 3 illustrates an intra-Node B serving HS-DSCH cell change while keeping the dedicated physical channel configuration and the active set, using the Physical channel reconfiguration procedure. The transition from source to target HS-DSCH cell is performed synchronised, i.e. at a given activation time.” Ex1005 at pg. 4.

192. Ericsson further discloses the procedure.

In this example, the UE transmits a MEASUREMENT REPORT message containing intra-frequency measurement results, here assumed to be triggered by the event 1D “change of best cell”. When the SRNC has performed the handover decision, the Node B is prepared for the serving HS-DSCH cell change at an activation time indicated with CPHY-RL-Commit-REQ primitive. The SRNC then sends a PHYSICAL CHANNEL RECONFIGURATION message, which indicates the target HS-DSCH cell and the activation time to the UE. Since the same Node B controls both the source and target HS-DSCH cells we assume there is no need to reset the MAC-hs entities. When the UE has completed the serving HS-DSCH cell change it transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message to the network.”

Ex1005 at pg. 4.

193. Ericsson describes a User Equipment (UE) comprising a transceiver and processor (as detailed previously), which executes a serving cell change procedure. During this procedure, the UE transitions its connection from a source cell (primary cell) to a target cell (a non-primary cell). Both source and target cells are in an “active set” controlled by the same Node B, i.e., are associated with the wireless network node controlling these cells.

194. Accordingly, Ericsson discloses Element [1c].

(e) [1d] receive configuration information for the primary cell and the one or more non-primary cells;

195. Ericsson discloses that the WTRU receives configuration information for the primary cell and the one or more non-primary cells.

196. In section 3.1, Ericsson discusses intra-Node B synchronised serving HS-DSCH cell change. Ex1005 at pg. 4-5. Ericsson states “Figure 3 illustrates an intra-Node B serving HS-DSCH cell change while keeping the dedicated physical channel configuration and the active set, using the Physical channel reconfiguration procedure. The transition from source to target HS-DSCH cell is performed synchronised, i.e. at a given activation time.” Ex1005 at pg. 4.

197. Ericsson discloses the procedure.

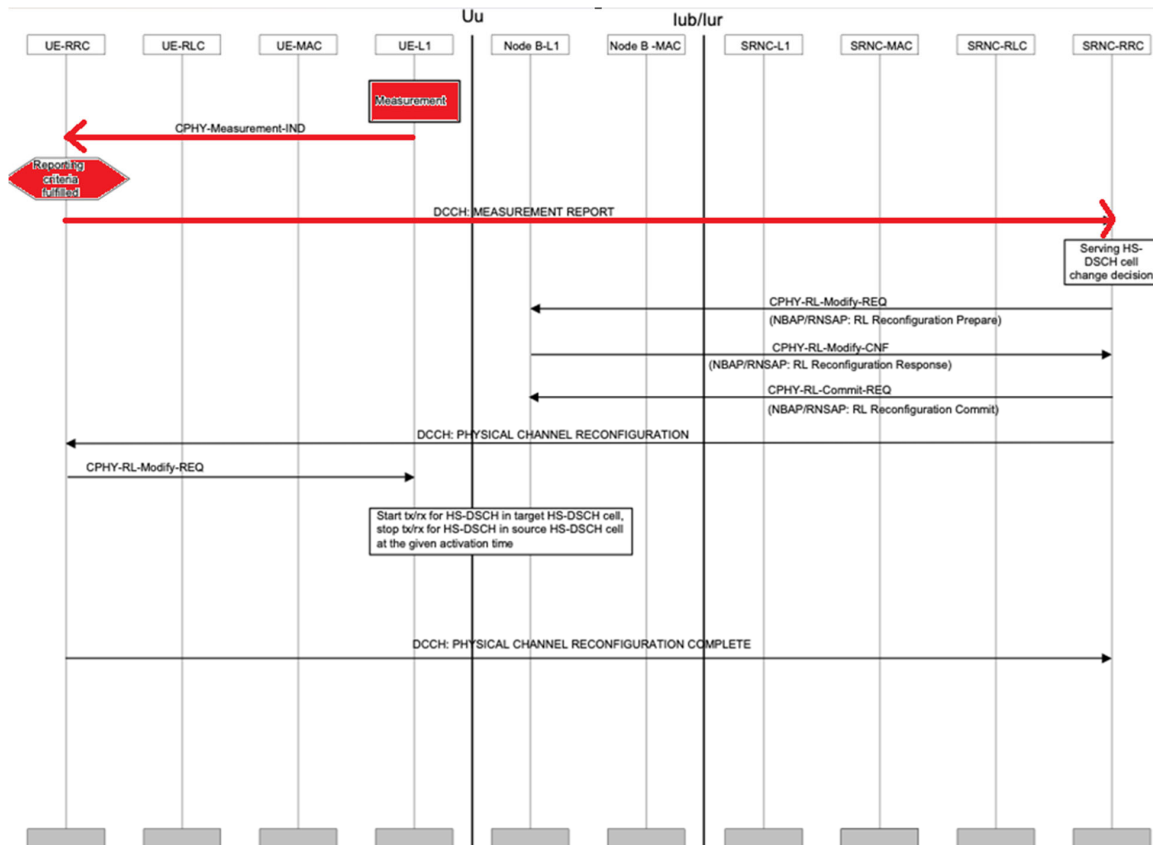
In this example, the UE transmits a MEASUREMENT REPORT message containing intra-frequency measurement results, here assumed to be triggered by the event 1D “change of best cell”. When the SRNC has performed the handover decision, the Node B is prepared

for the serving HS-DSCH cell change at an activation time indicated with CPHY-RL-Commit-REQ primitive. The SRNC then sends a PHYSICAL CHANNEL RECONFIGURATION message, which indicates the target HS-DSCH cell and the activation time to the UE. Since the same Node B controls both the source and target HS-DSCH cells we assume there is no need to reset the MAC-hs entities. When the UE has completed the serving HS-DSCH cell change it transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message to the network.”

Ex1005 at pg. 4.

“Figure 3 illustrates an intra-Node B serving HS-DSCH cell change while keeping the dedicated physical channel configuration and the active set, using the Physical channel reconfiguration procedure.”

Id.



Annotated Figure 3 of Ericsson Showing Intra-Node B serving cell change

198. The annotated Figure 3 from Ericsson illustrates a User Equipment (UE) measurement and reporting procedure, highlighted in red in the figure above. Specifically highlighted is the UE's transmission of a Measurement Report message containing intra-frequency measurement results, which are triggered by event 1D, described as a "change of best cell." In this process, the UE's Layer 1 gathers measurement data without change of the active set, compiles these results, and transmits them to the Node B via the UE's Radio Resource Control (RRC) layer. EX1005 at pgs. 4-5.

199. While Ericsson does not explicitly indicate that the UE also receives configuration information for the primary cell, a POSITA would understand that in Ericsson the UE receives configuration information for the primary cell. For example, Ericsson states “the UE transmits a MEASUREMENT REPORT message containing intra-frequency measurement results, assumed here to be triggered by the event 1D ‘change of best cell.’” EX1005 at pg. 4. This reference to the event 1D “change of best cell” would be understood as requiring that the UE has previously received configuration information necessary to communicate with the Node-B in general and to initiate measurements and generate the Measurement Report in particular.

200. To the extent the teachings of Ericsson need to be supplemented, in the same field of endeavor (i.e., intra-Node B synchronized cell change), TS25.331 explicitly teaches “receiv[ing] configuration information for the primary cell and the one or more non-primary cells,” as required by the ’803 patent.

201. For example, in response to “Reception of an RRC CONNECTION SETUP message by the UE” the UE “shall:.... Initiate the radio bearer, transport channel and physical channel configuration in accordance with the received radio bearer, transport channel and physical channel information elements.” EX1006 at pg. 69. Thus, the RRC CONNECTION SETUP message which corresponds to the

claimed “configuration information for the primary cell” is explicitly disclosed by TS25.331.

202. Furthermore, TS25.331 discloses that the network transmits and the UE receives the claimed configuration information for the non-primary cell via the “Reconfiguration procedures” discussed in section 8.2.2, a typical example shown in Figure 8.2.2-9 as shown below: (EX1006 at pgs. 110-111)

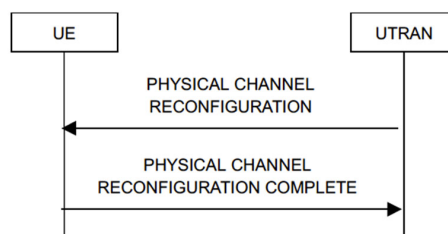


Figure 8.2.2-9: Physical channel reconfiguration, normal flow

203. TS25.331 continues to explain that reconfiguration procedures include “the physical channel reconfiguration procedure” (EX1006 at pg. 111) and, referring to this procedure (amongst others) the UE “may perform a hard handover... and/or an HS-DSCH cell change.” *Id.*

204. TS25.331 teaches “Intra-frequency measurement reporting criteria” including “Event 1d: Change of best cell” for triggering “event-triggered reporting for an intra-frequency measurement.” EX1006 at pg. 254. With respect to these triggered UE measurements, TS25.331 teaches that a “UTRAN may control a measurement in the UE ... by transmitting a MEASUREMENT CONTROL

message.” EX1006 at pg.191. The transmission of this message is shown in TS25.331 in Figure 8.4.1-1 reproduced below. EX1006 at pg. 193.



Figure 8.4.1-1: Measurement Control, normal case

205. UTRAN stands for UMTS Terrestrial Radio Access Network, the radio access network used in 3G UMTS networks. These networks comprise base stations (Node Bs) and Radio Network Controllers (RNCs) that connect mobile devices to the core network. As such, TS25.331 teaches a measurement control message being sent to a UE via the Node B for controlling the UE to take measurements for triggering “event-triggered reporting for an intra-frequency measurement.”

206. TS25.331 specifies “different types of measurements” being controlled by the measurement control message. EX1006 at pg. 192. “Intra-frequency measurements: measurements on downlink physical channels at the same frequency as the active set.” *Id.* TS25.331 specifies that information on such measurements is “found in subclause 14.1” of TS 25.331. *Id.*

207. Subclause 14.1, specifically 14.1.2.4, includes “Reporting event 1D: Change of best cell,” as specified in Ericsson. EX1006 at pg. 314. TS25.331

further teaches “send[ing] a measurement report,” as discussed in Ericsson, with “intra-frequency measurement event results” upon satisfaction of certain criteria that is part of the event 1D triggering. EX1006 at pgs. 314-315. Specifically, TS25.331 teaches that the “Event 1d: Change of best cell” measurements in the active set are triggered based on two equations, as follow:

Equation 1 (Triggering condition for pathloss)

$$10 \cdot \text{Log}M_{NotBest} + CIO_{NotBest} \leq 10 \cdot \text{Log}M_{Best} + CIO_{Best} - H_{1d} / 2,$$

Equation 2 (Triggering condition for all the other measurement quantities)

$$10 \cdot \text{Log}M_{NotBest} + CIO_{NotBest} \geq 10 \cdot \text{Log}M_{Best} + CIO_{Best} + H_{1d} / 2,$$

208. The variables in the formula are defined as follows:

$M_{NotBest}$ is the measurement result of a cell not stored in "best cell" in the variable BEST_CELL_1D_EVENT.

$CIO_{NotBest}$ is the cell individual offset of a cell not stored in "best cell" in the variable BEST_CELL_1D_EVENT.

M_{Best} is the measurement result of the cell stored in "best cell" in variable BEST_CELL_1D_EVENT.

CIO_{Best} is the cell individual offset of a cell stored in "best cell" in the variable BEST_CELL_1D_EVENT.

H_{1d} is the hysteresis parameter for the event 1d.

If the measurement results are pathloss or CPICH-Ec/No then $M_{NotBest}$ and M_{Best} are expressed as ratios.

If the measurement result is CPICH-RSCP then $M_{NotBest}$ and M_{Best} are expressed in mW.

EX1006 at pg. 315.

209. When a UE's current state satisfies one or more of the above two equations, the UE is triggered to transmit a MEASUREMENT REPORT message (as shown in Figure 3 from Ericsson). EX1006 at pg. 314-315.

210. As illustrated above, TS25.331 defines two distinct sets of variables within its equations. The first set includes measurement results, specifically M_{Best} obtained from the cell identified as the "best cell," and M_{NotBest} obtained from a cell not categorized as the "best cell." The second set comprises cell-specific parameters— $C_{\text{IO}_{\text{NotBest}}}$, $C_{\text{IO}_{\text{Best}}}$, and H_{1d} —which are previously transmitted to the UE. The parameters $C_{\text{IO}_{\text{NotBest}}}$ and $C_{\text{IO}_{\text{Best}}}$ represent cell individual offsets applicable to cells designated as non-best and a cell designated as best, respectively, while H_{1d} denotes a "hysteresis parameter for the event 1d." EX1006 at pg. 315. These hysteresis and cell offset parameters are communicated to the UE through the previously discussed "Measurement Control message," as specified by TS25.331.

211. Further, each of the measurement results variables and the cell parameters is associated with a "Best" cell or a "NotBest" cell. See EX1006, p. 315. In relevance to the claim element [1d], the "Best" cell satisfies the "primary cell" and the "NotBest" cells satisfies the "one or more non-primary cells." Accordingly, these variables are considered configuration information for the primary cell and for the non-primary cells.

212. In summary, Ericsson describes a scenario where a User Equipment (UE) transmits a measurement report that includes cell measurements for cells within an active set, triggered by the satisfaction of event 1D criteria. Although Ericsson does not explicitly detail the UE's reception of configuration information regarding these active set cells, a POSITA would understand that such configuration information must have been received by the UE. In any case, TS25.331 explicitly describes a Measurement Control message transmitted from the UTRAN via the Node B to the UE. This message contains essential configuration parameters, including a hysteresis parameter and cell-specific offsets, necessary for controlling event 1D measurement triggers.

213. Accordingly, Ericsson in view of TS25.331 discloses Element [1d].

- (f) [1e] receive a message on the primary cell, the received message including an indication of at least one of the one or more non-primary cells from which the WTRU is to receive a downlink shared channel transmission; and**

214. Ericsson discloses that the WTRU receives a message on the primary cell, the received message including an indication of at least one of the one or more non-primary cells from which the WTRU is to receive a downlink shared channel transmission.

215. For example, in section 2 “Discussion of mobility procedures” Ericsson states

Due to the similarity of DSCH and HS-DSCH it is straightforward to design the respective handover procedures alike. In Release 99 and Release 4 support for the following DSCH handover scenarios is provided:

Change of serving DSCH cell within the given active set.

EX1005 at pg. 1.

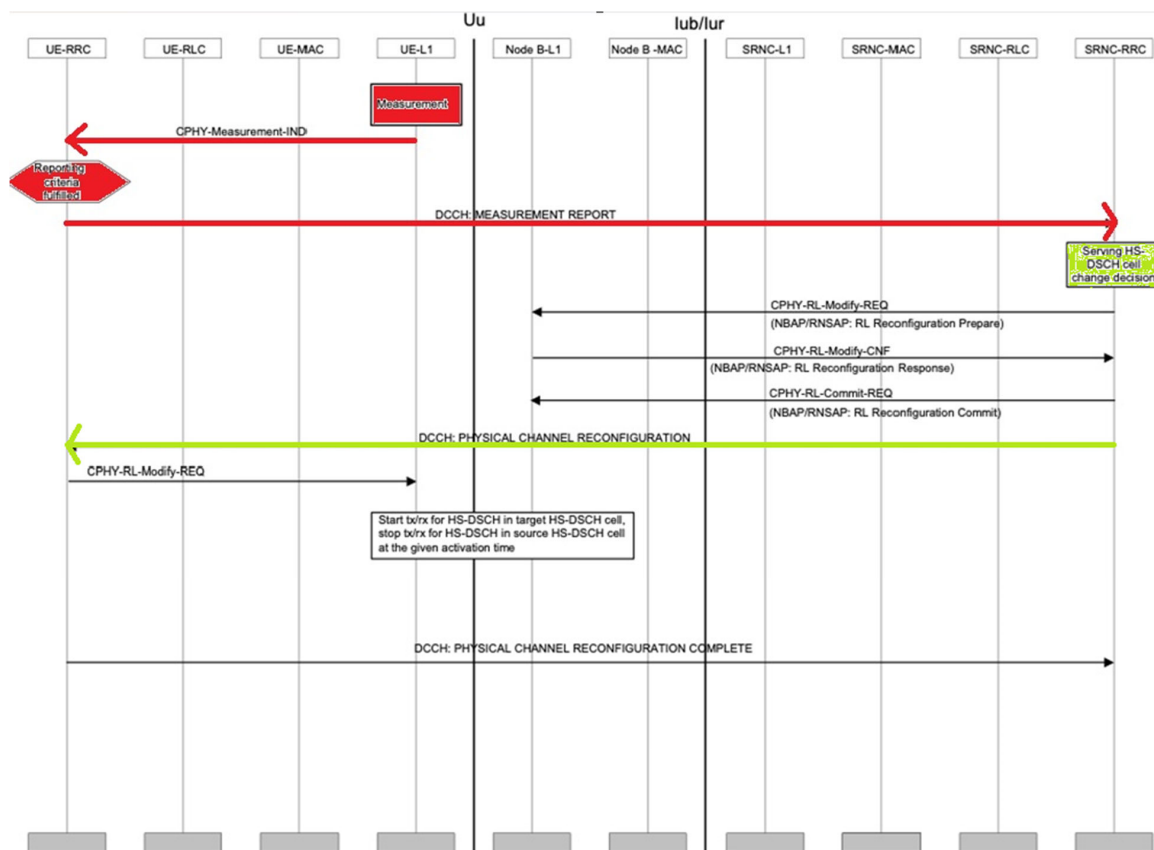
216. As discussed above, Ericsson discusses intra-Node B synchronised serving HS-DSCH cell change. Ex1005 at pg. 4. Ericsson states “Figure 3 illustrates an intra-Node B serving HS-DSCH cell change while keeping the dedicated physical channel configuration and the active set, using the Physical channel reconfiguration procedure. The transition from source to target HS-DSCH cell is performed synchronised, i.e. at a given activation time.” EX1005 at pg. 4.

217. Ericsson discloses the procedure.

In this example, the UE transmits a MEASUREMENT REPORT message containing intra-frequency measurement results, here assumed to be triggered by the event 1D “change of best cell”. When the SRNC has performed the handover decision, the Node B is prepared for the serving HS-DSCH cell change at an activation time indicated with CPHY-RL-Commit-REQ primitive. The SRNC then sends a PHYSICAL CHANNEL RECONFIGURATION message, which indicates the target HS-DSCH cell and the activation time to the UE. Since the same Node B controls both the source and target HS-DSCH cells we assume there is no need to reset the MAC-hs entities. When the UE has completed the serving HS-DSCH cell change it transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message to the network.”

Ex1005 at pg. 4.

218. Ericsson discloses a “PHYSICAL CHANNEL RECONFIGURATION message, which indicates the target HS-DSCH cell and the activation time to the UE.” EX1005 at pg. 4. This message is shown in green in the annotated version of Figure 3 of Ericsson below.



Annotated Figure 3 of Ericsson Showing Intra-Node B serving cell change (EX1005 at pg. 5)

219. Ericsson specifies that the Node B sends a Physical Channel Reconfiguration message to the UE, identifying both a target cell and the activation time for a cell change. Since this Physical Channel Reconfiguration message

includes only details of the target cell and activation timing, it logically must be transmitted to and received by the UE via the primary cell. This approach is necessary because the cell transition can only be implemented after the UE receives instructions regarding the new target cell and the timing for switching, as provided explicitly in the Physical Channel Reconfiguration message. The new target cell is a non-primary cell from which the UE is expected to receive a downlink shared channel transmission as claimed.

220. Accordingly, Ericsson discloses Element [1e].

(g) [1f] in response to the received message, receive and process the downlink shared channel transmission from the indicated at least one of the one or more non-primary cells.

221. Ericsson discloses that the WTRU in response to the received message, receives and process the downlink shared channel transmission from the indicated at least one of the one or more non-primary cells.

222. For example, in section 2 “Discussion of mobility procedures” Ericsson states

Due to the similarity of DSCH and HS-DSCH it is straightforward to design the respective handover procedures alike. In Release 99 and Release 4 support for the following DSCH handover scenarios is provided:

Change of serving DSCH cell within the given active set.

EX1005 at pg. 1.

223. As discussed above, Ericsson discusses intra-Node B synchronised serving HS-DSCH cell change. EX1005 at pg. 4. Ericsson states “Figure 3 illustrates an intra-Node B serving HS-DSCH cell change while keeping the dedicated physical channel configuration and the active set, using the Physical channel reconfiguration procedure. The transition from source to target HS-DSCH cell is performed synchronised, i.e. at a given activation time.” EX1005 at pg. 4.

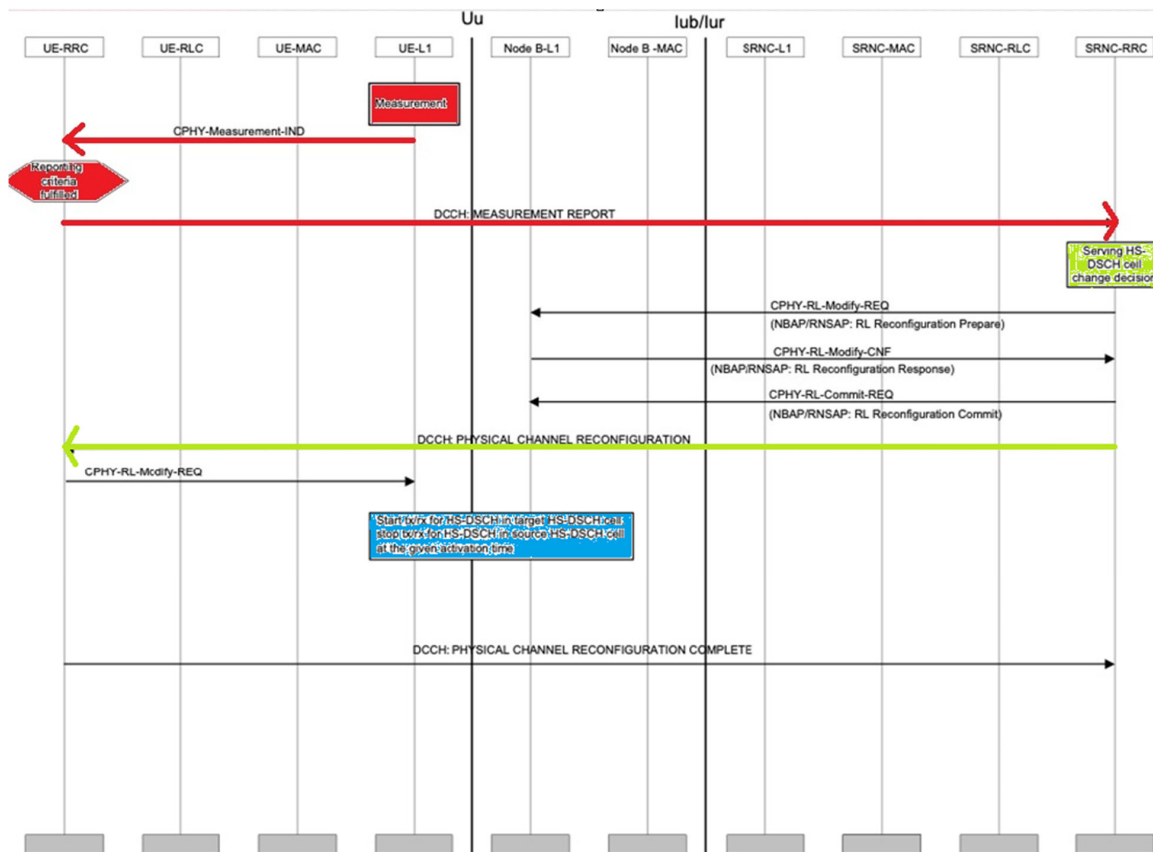
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In this example, the UE transmits a MEASUREMENT REPORT message containing intra-frequency measurement results, here assumed to be triggered by the event 1D “change of best cell”. When the SRNC has performed the handover decision, the Node B is prepared for the serving HS-DSCH cell change at an activation time indicated with CPHY-RL-Commit-REQ primitive. The SRNC then sends a PHYSICAL CHANNEL RECONFIGURATION message, which indicates the target HS-DSCH cell and the activation time to the UE. Since the same Node B controls both the source and target HS-DSCH cells we assume there is no need to reset the MAC-hs entities. When the UE has completed the serving HS-DSCH cell change it transmits a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message to the network.”

EX1005 at pg. 4.

225. Further, Ericson states “Start tx/rx for HS-DSCH in target HS-DSCH cell, stop tx/rx for HS-DSCH in source HS-DSCH cell at the given activation time.” EX1005 at pg. 5, Fig. 3.

226. These concepts are illustrated in Ericsson Figure 3, reproduced below.



Annotated Figure 3 of Ericsson Showing Intra-Node B serving cell change.

227. Shown above is an annotated Figure 3 of Ericsson, highlighting in blue, where Ericsson teaches “Start tx/rx for HS-DSCH in target HS-DSCH cell, stop tx/rx for HS-DSCH in source HS-DSCH cell at the given activation time.” The target HS-DSCH cell is the non-primary cell that service was switched to as a result of the previously received Physical Channel Reconfiguration message.

Therefore, Ericsson teaches receiving and processing downlink shared channel transmissions from the indicated non-primary cell (i.e., target HS-DSCH cell).

228. Accordingly, Ericsson discloses Element [1f].

3. Dependent Claim 2

229. In my opinion, the combination of Ericsson and TS25.331 renders claim 2 obvious.

(a) [2a] The WTRU of claim 1

230. *See* Section IX.B.2 above.

(b) [2b] wherein there is a time delay between the downlink shared channel transmission and the receipt of the message by the WTRU.

231. Ericsson discloses that the downlink shared channel transmission may be received from a non-primary cell in response to receiving a message, as described above. In this context, Ericsson teaches that “a PHYSICAL CHANNEL RECONFIGURATION message” is received by the UE and includes “the target HS-DSCH cell and the activation time to the UE.” EX1005 at pg. 4. Ericsson further explains that the “transition from source to target HS-DSCH cell” is “performed synchronized, i.e., at a given activation time.” EX1005 at pg. 4. The activation time represents a delay between the time the PHYSICAL CHANNEL RECONFIGURATION message is received and when the UE begins receiving on the target HS-DSCH cell.

232. Accordingly, Ericsson teaches the claimed “time delay” of dependent claim 2.

4. Dependent Claim 5

233. In my opinion, the combination of Ericsson, TS25.331 and the POSITA’s knowledge at the time of the purported invention renders claim 5 obvious under Section 103.

(a) [5a] The WTRU of claim 1

234. See Section X.B.2 above.

(b) [5b] wherein the transceiver and the processor are further configured to cause the WTRU to receive a grant for an uplink transmission from the primary cell

235. Claim 5 depends from Claim 1, and Claim 1 requires that the “transceiver and the processor are configured” to accomplish what is specified in Claim 1. Claim 5 requires that the “transceiver and the processor are **further configured**” to accomplish additional objectives. Thus, there is no temporal relationship between these objectives. In other words, the additional limitation of Claim 5 is that the WTRU’s transceiver and processor are further configured to “cause the WTRU to receive a grant for an uplink transmission from the primary cell” at any point in time, before, during, or after a handover.

236. The UE’s discussed in the context of Ericsson and TS25.331 are so configured.

237. Specifically, TS25.331 discloses this limitation. See section X.B.2 above which in conjunction with a POSITA's knowledge discloses this limitation. Specifically, the very reason TS25.331 exists is to allow for a two-way communication between a UE and a base station. When the UE is using one downlink cell, that one cell is the "primary cell" and it is used for downlink transmissions. TS25.331 also defines messages for uplink transmissions.

238. One of many examples is provided in Section 8.1.10.2 of TS25.331 (See EX1006 at pg. 88) discussing the "Initiation of uplink direct transfer procedure in the UE". TS25.331 explains that in the UE, "the uplink direct transfer procedure shall be initiated when the upper layers request a transfer of a NAS message on an existing signalling connection" and the UE "shall transmit the UPLINK DIRECT TRANSFER message on the uplink DCCH using AM RLC on signaling radio bearer RB3". *Id.*

239. A POSITA would readily understand that transmitting said message requires previous granting of resources by the base station, the grant being received on the primary cell, since it is the primary cell, and only the primary cell, that the UE is using to communicate with the base station. The fact that the UE's transceiver and processor are **also** configured to perform a handover as required by Claim 1 is irrelevant.

240. Thus 36.331 discloses that the UE receives a grant for an uplink transmission from the primary cell and proceeds to engage in the uplink transmission based on the received grant.

241. Furthermore, having a mobile device² configured in a way to receive a grant for an uplink transmission from a cell with which it is in communication with, thus the “primary cell”, which is a cell with which the mobile device would be communicating before a handover might be needed, was well known from the earliest days of mobile communications.

242. For example: “A major difference between a radio mobile telecommunication network and a network with fixed links is the management of the access resources. In a fixed system, a dedicated communication medium exists continuously between the user terminal and the infrastructure ready to be used when a call need[s] (*sic*) to be established. On the contrary, in a cellular system like GSM, a dedicated channel over the radio interface **is provided to the mobile stations** only on demand and for the duration of the call, **under the control of the infrastructure.**” EX1012 at pg. 5 (emphasis added).

243. Mouly goes on to dedicate at least Chapters 6, 7, and 8 to defining how communication services are provided in GSM; specifically, it explains that

² E.g. a WTRU (Wireless Transmit/Receive Unit) in the language of the claim, a UE (User Equipment) in the language of UMTS, or a MS (Mobile Station) in the language of GSM.

“This and the two next chapters³ are devoted to the description of these information exchanges, which enable distant participants, users and machines, to act together to provide the communication services for which the network is designed.” EX1012 at pg. 4.

244. In short, receiving a grant for an uplink transmission from the infrastructure of the network using the cell with which a mobile device is communicating, i.e., a primary cell, was well within a POSITA’s knowledge.

245. Thus, in addition to the disclosures in TS25.331, a POSITA’s knowledge discloses Element [5b].

(c) [5c] and to transmit the uplink transmission based on the received grant.

246. Similarly to element [5b] discussed above, a POSITA would know that the very reason for granting radio resources to a UE is for the UE to use said resources for an uplink transmission based on those resources provided in the grant.

247. While this is abundantly clear, it is further confirmed by the teachings of Mouly which discloses that “Once it has received an initial assignment indication, the addressed mobile station modifies its reception and transmission

³ I note that this portion on pg 309 is in the first paragraph of Chapter 6.

configuration to adapt it to the frequency and time characteristics of the new channel.” EX1012 at pg. 7.

248. It also explains that “the RR-session is fully established with a complete signalling path between the mobile station and the MSC. With the establishment of the SCCP [Signaling Connection Control Part] connection, the MSC takes control of the decisions concerning the transmission characteristics of the RR session, and the BSS is at the ready whilst monitoring the transmission and performing handover decisions.” Id. at pg. 8.

249. Thus, a POSITA’s knowledge thus discloses Element [5c]

250. Therefore, Ericsson, TS25.331 and a POSITA’s knowledge renders Claim 5 obvious.

5. Dependent Claim 6

(a) [6a] The WTRU of claim 5

251. See section X.B.2 above.

(b) [6b] wherein the transceiver and the processor are further configured to cause the WTRU to process an acknowledgement/negative acknowledgement to the uplink transmission received only from the primary cell.

252. Claim 6 depends from Claim 5 which depends from Claim 1 wherein Claims 1 and 5 require that the “transceiver and the processor are configured” to accomplish what is specified in Claim 1 and Claim 5 respectively. Claim 6

requires that the “transceiver and the processor are **further configured**” to accomplish additional objectives. Thus, there is no temporal relationship between these objectives and those of Claim 1. In other words, the additional limitation of Claim 6 is that the WTRU’s transceiver and processor are further configured to “process an acknowledgement/negative acknowledgement to the uplink transmission received only from the primary cell” at any point in time, before, during, or after a handover.

253. The UE’s discussed in the context of Ericsson and TS25.331 are so configured and a POSITA would be well aware of that.

254. Transmitting information, and receiving acknowledgment/negative acknowledgment (which I may use the common abbreviation ACK/NACK) is as old as data communications itself. Thus, there is nothing inventive about requiring a WTRU to process such an ACK/NACK. Furthermore, in the context of the claim, a WTRU that is in communication with one cell, the primary cell before a handover is initiated, would be configured to receive said ACK/NACK only from the cell with which it is communicating, i.e., the primary cell.

255. As a POSITA would be well aware of, Mouly, referring to three protocols used in transmissions in GSM, explains that all three protocols “use HDLC-like mechanisms for backward error correction, with a choice of two modes”, one of these modes being “the **acknowledge** mode, ensuring correction of

erroneous frames **by repetition.**” EX1012 at pg. 3 (emphasis added). I note that HDLC stand for High level Data Link Control, a well-known protocol in data communications (See, for example, EX1013 at pgs. 20, 21, and 23-29) and HDLC-like refers to the fact that the protocols used in GSM are very similar to HDLC.

256. A POSITA would understand that repeating a previously transmitted frame that was received in error (i.e., an “erroneous frame”) would be effected by having received a negative acknowledgment, i.e., a NACK. Similarly, a correctly received frame would be acknowledged by receiving an ACK.

257. A POSITA’s knowledge of receiving ACK/NACKs for previous transmissions is also confirmed by an older, classic book on data networking, “Data Networks”, Second Edition, by Dimitri Bertsekas and Robert Gallager, Prentice Hall, 1992. (“Bertsekas”, EX1013). Bertsekas explains that the “basic idea of ARQ [automatic repeat request] for data on a link from A to B is to accept out-of-order packets and to request retransmissions from A only for those packets that are not correctly received.” EX1013 at pg. 22 (emphasis added).

258. To the extent that Bertsekas does not explicitly use the term ACK/NACK a POSITA would have found it obvious to inform the transmitter A that a given transmission was successfully received, by transmitting an ACK, or was not successfully received by transmitting a NACK.

259. Therefore, the combination of Ericsson, TS25.331 and a POSITA's knowledge renders Claim 6 obvious.

6. Independent Claim 7

(a) [7pre] A method comprising

260. To the extent this preamble is limiting, Ericsson and TS25.331 include teachings and suggestions of performing a method comprising all of the teachings of those references.

261. Accordingly, Ericsson in view of TS25.331 teaches [7pre].

(b) [7a] receiving, by a wireless transmit/receive unit (WTRU), configuration information for a primary cell and one or more non-primary cells, wherein the primary cell is associated with a wireless network node and the one or more non-primary cells are associated with the wireless network node

262. Ericsson in view of TS25.331 teach [7a], which is substantially the same as [1pre], [1c] and [1d]. See Sections X(B)(2)(a), X(B)(2)(c), and X(B)(2)(d).

263. Accordingly, Ericsson in view of TS25.331 teaches [7a].

(c) [7b] receiving, by the WTRU, a message on the primary cell, the received message including indication of at least one of the one or more non-primary cells from which the WTRU is to receive a downlink shared channel transmission

264. Ericsson discloses [7b], which is substantially the same as [1e]. See Section X(B)(2)(e).

265. Accordingly, Ericsson in view of TS25.331 teaches [7b].

- (d) **[7c] in response to the received message, receiving and processing, by the WTRU, the downlink shared channel transmission from the indicated at least one of the one or more non-primary cells**

266. Ericsson discloses [7c], which is substantially the same as [1f]. See Section X(B)(2)(f).

267. Accordingly, Ericsson in view of TS25.331 teaches [7c].

268. Thus, the combination of Ericsson and TS25.331 discloses the limitation of claim 7 and renders it obvious. *See* Section X.B.2.

7. Dependent Claim 8

- (a) **The method of claim 7 wherein there is a time delay between the downlink shared channel transmission and the receipt of the message by the WTRU.**

269. Ericsson in view of TS25.331 teach all the limitations of dependent claim 8, which is substantially the same as features [2a] and [2b] from dependent claim 2 discussed above in Section X.B.3. See the above related sections.

270. Thus, the combination of Ericsson and TS25.331 discloses the limitation of claim 8 and renders it obvious. *See* Section X.B.3.

8. Dependent Claim 11

- (a) **The method of claim 7 further comprising receiving, by the WTRU, a grant for an uplink transmission from**

the primary cell and transmitting, by the WTRU, the uplink transmission based on the received grant

271. Ericsson, TS25.331 and a POSITA's knowledge discloses dependent claim 11, which is substantially the same as features [5a], [5b], and [5c]. See the above related sections.

272. Thus, the combination of Ericsson, TS25.331 and a POSITA's knowledge discloses the limitation of claim 11 and renders it obvious. *See* Section X.B.4.

9. Dependent Claim 12

273. Ericsson, TS25.331 and POSITA's knowledge discloses dependent claim 12, which is substantially the same as features [6a] and [6b]. See the above related sections.

274. Thus, the combination of Ericsson, TS25.331 and a POSITA's knowledge discloses the limitations of claim 12 and renders it obvious. *See* Section X.B.5.

C. Ground 3: Claims 5, 6, 11, and 12 Would Have Been Obvious in View of Ericsson, TS25.331 and Sebire

1. The Ericsson, TS25.331, Sebire Combination

275. The combination of Ericsson with TS25.331 has been previously addressed. It would have been additionally obvious to a POSITA, prior to the

earliest possible priority date of the '803 patent, to combine Sebire with Ericsson and TS25.331 to reach the claimed subject matter of claims 5, 6, 11, and 12.

276. A skilled artisan would have recognized the motivation to combine Sebire with Ericsson and TS25.331 due to their alignment in technological scope and objectives. Specifically, Ericsson, TS25.331, and Sebire each focus on related technologies addressing protocols for wireless communication. Given their similar technical objectives and the clear potential advantages from integrating their teachings, a skilled artisan would confidently expect success in combining these references.

277. Ericsson, TS25.331, and Sebire represent analogous art concerning the '803 patent, each addressing similar challenges in wireless communication protocols and handovers in particular. The technical disclosures within each reference directly pertain to the same problems faced by the inventor, particularly developing protocols for efficient management of the radio resources within wireless communication systems, including during a handover process.

278. These references are readily combinable since all are directed toward protocols governing radio interface management between user equipment (UE) and base stations. A skilled artisan would naturally apply beneficial aspects of TS25.331 and Sebire to Ericsson's teachings to enhance the operation of a wireless system, including the handover procedures.

279. Specifically, Sebire states, under “Field of the Invention” that the “present invention relates to a method of handover. In particular, but not exclusively, the present invention relates to a method of **handing over** user equipment, for example, a mobile station **from one cell to another cell** of a cellular communications network. The mobile station **may send and/or receive packets of data.**” See EX1007 at pg. 1 (emphasis added). Sebire performs handover during an ongoing a Temporary Block Flow (TBF) initiated by a source cell to provide a grant for uplink transmission to the UE. EX1007, 4.

280. Given that Ericsson and TS25.331 address handover procedures and TS25.331 defines the RRC protocol, which is the set of messages, rules, etc. regarding the allocation and usage of the Radio Resources used for sending and receiving data, it is clear that a POSITA would consider Sebire’s teachings in considering the problems identifies in the ’803 patent. Incorporation of Sebire’s teachings would have enhanced the data communication between the network and the UE. As Sebire explains, “the mobile does not have to listen to broadcast messages but gets this information during the ongoing TBF in the **source cell**. With this mechanism, the mobile station can set up the TBF link in the **target cell** without having any delay caused by the mobile station listening to information broadcast by the base station of the new cell”. EX1007, 5 (emphasis added).

281. In addition, Sebire teachings are driven by the continued development of GSM (a 2G technology) and GPRS in particular, which has been referred to as “2.5G” technology. As I discussed in section V above, a POSITA considering continued development of 3G would only naturally consider lessons and knowledge developed in the context of 2G and 2.5G. Such considerations are at the heart of the concept of “evolving technologies”.

282. In conclusion, combining Ericsson, TS25.331, and Sebire would have been an obvious step for a skilled artisan, undertaken with a strong expectation of success given the established understanding of handover and other communication engineering concepts within the field. The integration of these references represents straightforward application of known techniques and common-sense improvements, rendering claims 5, 6, 11, and 12 of the '803 patent obvious.

2. Dependent Claim 5

(a) [5a] The WTRU of claim 1

283. Ericsson discloses this limitation. See section X.B.2 above.

(b) [5b] wherein the transceiver and the processor are further configured to cause the WTRU to receive a grant for an uplink transmission from the primary cell

284. See section X.B.4.(b) which I incorporate here in its entirety.

285. To the extent that it is argued that the disclosures of TS25.331 are not sufficient, Sebire discloses the notion of an “ongoing TBF (Temporary Block Flow) via the **source cell**,” EX1007 at pg. 3, ll. 7-8 (emphasis added). A TBF was

known to include grants for an uplink transmission. For example, Bates explains under the section heading “Temporary Block Flow—Uplink (UL) Data Transfer” that this procedure “is an example of message sequence for the uplink data transfer with one resource reallocation and possible RLC data blocks retransmissions (we assume that the transfer mode is ACK).” EX1014 at pg. 7. Bates also explains under the heading “Temporary Block Flow (TBF) for Dynamic Allocation” that “[w]hen a mobile station decodes its USF on one radio block DL, it is allowed to transmit on the next radio block UL”. EX1014 at pgs. 4-5.

286. Thus, the allocation of an “ongoing TBF” contemplated by Sebire discloses that the WTRU is configured to receive a grant for an uplink transmission from the primary cell.

287. Accordingly, Ericsson, TS25.331, and Sebire clearly disclose Element [5b].

(c) [5c] and to transmit the uplink transmission based on the received grant.

288. See section X.B.4(c) which I incorporate here in its entirety.

289. Furthermore, regarding Sabire’s disclosure, an “ongoing TBF” would be understood by a POSITA to include both the grant for an uplink transmission as well as the transmission itself.

290. Sebire further explains that “[in] case the mobile station has been assigned uplink TBF and it has valid timing advance information the mobile

station may continue normal operation and send RLC/MAC data and/or control blocks in the uplink blocks indicated with USF or RRBP [Relative Reserved Block Period] fields or using fixed allocation.” EX1007 at pg. 10, ll. 8-12.

291. This understanding is further confirmed by the explanations of TBF provided by Bates as I discussed with respect to limitation [5b] above.

292. Accordingly, Ericsson, TS25.331 and Sebire discloses Element [5c] and thus they disclose all limitations of Claim 5 rendering it obvious.

3. Dependent Claim 6

(a) [6a] The WTRU of claim 5

293. See section X.B.4 above.

(b) [6b] wherein the transceiver and the processor are further configured to cause the WTRU to process an acknowledgement/negative acknowledgement to the uplink transmission received only from the primary cell.

294. See section X.B.5(b) which I incorporate here in its entirety.

295. Furthermore, Sebire discloses that a field called “RLC_MODE” is a one-bit field that “indicates the RLC mode of the requested TBF”, wherein a “0” indicates “RLC acknowledged mode”. Indeed, the notion and associated terms “acknowledged mode” (AM) and “unacknowledged mode” (UM) are also disclosed in TS25.331, e.g., in Section 3.2, as shown below:

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ACK	Acknowledgement
AICH	Acquisition Indicator CHannel
AM	Acknowledged Mode
AS	Access Stratum
ASC	Access Service Class
ASN.1	Abstract Syntax Notation.1
BCCH	Broadcast Control Channel
...	...
...	...
...	...
UM	Unacknowledged Mode
URA	UTRAN Registration Area
U-RNTI	UTRAN-RNTI
USCH	Uplink Shared Channel
UTRAN	Universal Terrestrial Radio Access Network

EX1006, at pgs. 29-31.

296. Sebire explicitly discloses the well known operation of a communication system in which transmitted RLC data blocks are acknowledged or negatively acknowledged by stating that “If the RLC_DATA_BLOCKS_GRANTED field is present the mobile station shall transmit only the assigned number of RLC data blocks.... Retransmissions of negatively acknowledged RLC data blocks do not apply toward the maximum number.” EX1007 at pg. 24, ll. 25-29. A POSITA would understand the obvious logical conclusion that RLC data blocks are acknowledged if received correctly

and negatively acknowledged if not, thus requiring a retransmission which does not “count” towards the total allocation.

297. As I discussed above in the context of limitation [5b], Bates explains under the section heading “Temporary Block Flow—Uplink (UL) Data Transfer” that this procedure “is an example of message sequence for the uplink data transfer with one resource reallocation and possible RLC data blocks retransmissions (we assume that the transfer mode is ACK).” EX1014 at pg. 7. In other words, BATES discusses the transmission of acknowledgments and negative acknowledgments as something a POSITA would be fully aware of, since he simply states that it is assumed the “transfer mode is ACK”. EX1014 at pg. 7.

298. Lastly, the limitation that the acknowledgment/negative acknowledgment is received “only from the primary cell” is met since, as was the case in Claim 5, the UE is communicating only with the primary cell, i.e., the transceiver and the processor are configured to receive the acknowledgment/negative acknowledgment from the primary cell, and only the primary cell, much as they are “further” configured to perform other functions, e.g., those required by Claim 5 as well as those required by Claim 1.

299. Accordingly, Ericsson, TS25.331 and Sebire discloses Element [6b] and thus they disclose all limitations of Claim 6 rendering it obvious.

4. Dependent Claim 11

- (a) **[11a] The method of claim 7 further comprising receiving, by the WTRU, a grant for an uplink transmission from the primary cell and transmitting, by the WTRU, the uplink transmission based on the received grant**

300. Ericsson, TS25.331 and Sebire discloses dependent claim 11, which is substantially the same as features [5a], [5b], and [5c]. *See* Section X.C.2.

Accordingly, the combination of Ericsson, TS25.331, and Sebire discloses the limitations of claim 11 rendering it obvious. *See* Section X.C.2

5. Dependent Claim 12

- (a) **[12a] The method of claim 11 further comprising processing, by the WTRU, an acknowledgement/negative acknowledgement to the uplink transmission received only from the primary cell.**

301. Ericsson, TS25.331, and Sebire disclose dependent claim 12, which is substantially the same as features of claim 6. *See* Section X.C.3.

302. Accordingly, the combination of Ericsson, TS25.331, and Sebire discloses the limitations of claim 12 rendering it obvious. *See* Section X.C.3

XI. ACKNOWLEDGMENTS

303. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of

the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

304. 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 further, that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

A handwritten signature in dark ink, appearing to read "Gerald K. Hoke", written over a horizontal line.

Executed on May 18, 2025

Appendix A

APOSTOLOS K. KAKAES
Cosmos Communications Consulting Corporation, President
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AREAS OF EXPERTISE

All aspects of fixed and mobile communications. Over the years, my emphasis has been both in breadth and in depth, originally in fixed communications networks and then in mobile communications. Specific areas of in-depth expertise include:

- NR/5G, LTE/LTE-Advanced and evolution issues of 3G to 4G and 5G
- UMTS, including FDD, TDD, HSDPA/HSUPA, HSPA+, both air interface (UTRA) and Radio Access Network (RAN) as well as Core Network (CN) technologies
- GSM, GPRS, EDGE (EGPRS) and related evolutionary problems and solutions
- cdma2000 family from IS-95, through its evolution to 1x, 3x, 1xEV-DO (HDR), 1xEV-DV (all aspects of the evolution to “3G” and beyond)
- Wired and Wireless Local Area Networks (LAN) including all variants of IEEE 802.11 (WiFi)
- Metropolitan Area Networks (MAN), and Personal Area Networks (PAN) technologies, Paging networks, Ad hoc networks, including IEEE 802.16 (WiMAX), HIPERLAN, Bluetooth, Near Field Communications, IrDA (Infrared Data Association) operating with any of the available access technologies
- North American TDMA and IS-54/IS-136
- IMS, SIP, and VoIP (Voice over IP), including VoIP over LTE
- TETRA
- iDEN™
- Core Network technologies, IS-41, SS7, ATM, MAP, SAE, etc.
- Design and implementation of voice and data networking (circuit switching as well as all the evolving all IP-based technologies)
- Traffic engineering and network design; both air interface aspects (including resource allocation, QoS, MAC protocol, etc.) and design of core network, both user plane and control plane

EMPLOYMENT HISTORY

9/88 – Present

Cosmos Communications Consulting Corporation. Founder and president of private communications engineering consulting firm specializing in mobile communications. Initially part time; full time since 1994.

- Developed and presented courses, seminars, and lectures on fixed and mobile communications to both corporate and government entities, such as the FCC and the US Marshal’s Office.
- Consulted on high level technology-related issues and trends, pros and cons of each, etc. to corporate entities, governmental agencies, and international organizations, such as the UN.

- Consulted at the detailed technical level to engineering firms, operators, and equipment vendors on technical issues related to existing or evolving technologies for mobile communications.
- Served as technology consultant to the investment community on issues related to both fixed and wireless communications technologies.
- Served as consultant and/or testifying expert witness on both civil and criminal legal cases, including a class action lawsuit brought in California, a murder case in Illinois, and several patent infringement cases both at the ITC and in US district courts as well as in the High Court in the UK.
- Served as consultant and/or testifying expert witness on several Inter-Parte Re-examinations (IPRs).
- Served as consultant and testifying witness in Arbitrations involving mobile communications.
- Served as consultant and/or testifying expert witness in multiple legal proceedings involving the determination of “FRAND” rates for global licenses involving “SEP” patents.
- Participated as a technical consultant in the analysis of large patent portfolios for the purposes of due diligence, sales, and/or M/A activities for some of the largest companies in the mobile communications space.

Many of the above projects spanned a multidimensional spectrum of

- Technologies: both fixed and mobile communications as they have evolved over the past 30+ years;
- Audiences: non-technical support personnel, highly specialized engineers, Wall Street analysts, hedge fund managers, litigation teams, as well as decision making executives at the CEO/CFO/CTO level;
- Geographic and cultural backgrounds that span all continents and over 40 countries.

9/87 - 5/94

The George Washington University, Washington, D.C.; Department of Electrical Engineering and Computer Science.

- Taught mostly graduate courses in the area of communication engineering, including communication theory, coding theory, voice and data networking, and mobile communications.
- Proposed, developed and taught new graduate courses in the area of mobile communications.
- Received several research awards/grants, including the prestigious NSF Research Initiation Award.
- Participated in several committees, including the departmental Graduate Curriculum Committee as well as various University-wide committees.

7/85 - 12/86

Polytechnic Institute of New York, Brooklyn, New York. Joint appointment as Special Research Fellow and Adjunct Instructor (while pursuing the Ph.D. degree).

1/82 - 7/87

AT&T Bell Laboratories, Holmdel, New Jersey. Worked on modeling, analysis, design, and performance evaluation of voice and data networks. Developed algorithms for DNHR (Dynamic, Non-Hierarchical Routing) used in the telephone network. Analysis of advanced data services and formulation of long term plans for development of enhanced data services and network design tools to support such services.

7/76 - 12/81

University of Colorado, Boulder, Colorado and Michigan State University, East Lansing, Michigan. Undergraduate and then graduate teaching assistant.

EDUCATION

09/82 - 01/88

Polytechnic Institute of New York. Ph.D. in Electrical Engineering with a minor in Applied Mathematics.

Thesis Title: Topological Properties and Design of Multihop Packet Radio Networks.

Thesis Advisor: Professor Robert R. Boorstyn.

09/74 - 06/80

University of Colorado.

M.S. in Applied Mathematics with a minor in Electrical Engineering.

B.S. in Applied Mathematics with a minor in Electrical Engineering.

PROFESSIONAL ASSOCIATIONS AND ACTIVITIES

- Member of the IEEE (Active in the Communications Society, Vehicular Technology Society, and the Information Theory Society).
- Secretary, IEEE Communications Society National Capital Area Chapter, 91/92.
- Vice-Chair, IEEE Communications Society National Capital Area Chapter, 92/93.
- Vice-Chair of the Communication Theory Technical Committee of the Communications Society of the IEEE; Elected for the 1993-1996 term.
- Treasurer of the Communication Theory Technical Committee of the Communications Society of the IEEE, Elected for the 1996-1999 term.
- Reviewer for the IEEE, book editors, and other technical publications.
- Reviewer for various NSF Panels.
- Active Participant and Organizer of Technical Sessions in Technical Conferences, including the IEEE International Conference on Communications (ICC) and IEEE Global Communications Conference (Globecom).
- Technical Program Chair for the Communication Theory Mini-Conference, Dec. 1992.

19. "Traffic Engineering for Cellular Network Design", Presented at the Francusko-Polska Wyszka Szkola, Poznan, Poland, March 1994.
20. "Principles of Traffic Engineering and Network Design", Presented at the Regional Seminar on Mobile Cellular Radio Telephone Systems, by invitation of the ITU, April 19, 1994.
21. "Principles of Spread Spectrum Systems for Mobile Communications", Presented at the Regional Seminar on Mobile Cellular Radio Telephone Systems, by invitation of the ITU, April 20, 1994.
22. "Global System for Mobile Communications (GSM)", Presented at the Regional Seminar on Mobile Cellular Radio Telephone Systems, by invitation of the ITU, April 21, 1994.
23. "Global System for Mobile Communications (GSM)", Presented at ICC'94, New Orleans, LA.; May 1, 1994.
24. "GSM and DCS1900: Evolution to PCS", ICC/Supercom 1996, Dallas, Texas; June 23-27, 1996.
25. "Traffic Engineering Models for Mobile Communications", ICUPC96, Cambridge, Massachusetts; Sept. 29 - October 2, 1996.
26. "GSM-Recent Advances and Future Developments", Globecom'96, London, UK; November 1996.
27. "Advances in GSM and DCS1800/1900", ICC '97, Montreal, Canada; June 1997.
28. "The Global System for Mobile Communications (GSM) and its Derivatives (DCS1800, PCS1900)", ICC/Supercom '98, Atlanta, GA; June 1998.
29. "Teletraffic Engineering", Globecom '98, Sydney, Australia; November 1998.
30. "Traffic Engineering" in Encyclopedia of Telecommunications; Edited by John Proakis, John Wiley, 2002.