

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AT&T SERVICES INC., T-MOBILE USA, INC.,
CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS,
ERICSSON INC., AND
NOKIA OF AMERICA CORPORATION

Petitioners

v.

INNOVATIVE SONIC LIMITED AND CELERITY IP, LLC.

Patent Owner

Patent No. 9,237,489

DECLARATION OF DR. CHRISTOPHER HANSEN

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c.	“including information by the source eNB in a HandoverPreparationInformation message for a target eNB to control SCell release in the UE during a handover,”	49
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c.	“including information by the source eNB in a HandoverPreparationInformation message for a target eNB to control SCell release in the UE during a handover,”	55
d.	“wherein the information indicates SCell indexes of all SCells configured to the UE before the handover, thereby allowing the target eNB to include a <i>sCellToReleaseList</i> with all the SCells configured to the UE in a handover	

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b.	“a RRCConnectionReconfiguration message is sent from the source eNB to the UE to initiate a handover procedure.”	72
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b.	“configuring at least one SCell by a source eNB to a User Equipment (UE); and”	73
c.	“including information by the source eNB in a HandoverPreparationInformation message for a target eNB to control SCell release in the UE during a handover, wherein the information indicates SCell indexes of all SCells configured to the UE before the handover,”	73
d.	“thereby allowing the target eNB to include a <i>sCellToReleaseList</i> with all the SCells configured to the UE in a handover command for the UE to release the SCells included in the <i>sCellToReleaseList</i> .”	73

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I, Dr. Christopher Hansen, declare as follows:

I. INTRODUCTION

1. I have been retained as an independent expert consultant on behalf of AT&T Services Inc., T-Mobile USA, Inc., Cellco Partnership d/b/a Verizon Wireless, Ericsson Inc., and Nokia of America Corporation (collectively “Petitioners”) in this *Inter Partes* Review proceeding (“IPR”) before the Patent Trial and Appeal Board (“Board” or “PTAB”) of the United States Patent and Trademark Office (“PTO”) regarding U.S. Patent No. 9,237,489 (“the ’489 Patent”) (Ex. 1001).¹ I am being compensated at my rate of \$500 per hour for the time that I spend on this matter, in addition to expenses. My compensation in this case is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other interest in this proceeding.

2. This Declaration summarizes the opinions that I have formed to date and based on the material currently available to me. I reserve the right to modify my opinions, if necessary, based on further review and analysis of information that I receive subsequent to the filing of this Declaration, including in response to any positions taken by Innovated Sonic Limited (“Patent Owner”) or its experts that I

¹ In this Declaration, I reference documents by exhibit numbers that, as I understand, are attached as exhibits in this *Inter Partes* Review of the ’059 Patent.

have not been provided yet, including any secondary consideration evidence that Patent Owner or its expert may consider and present.

3. In my view, the prior art discloses or suggests the features recited in claims 1-22 (what I understand are the “Challenged Claims”) of the ’489 Patent. The ’489 Patent is invalid based on the following grounds that I understand are at issue in this IPR:

Ground	Claims	Basis for Unpatentability
3	1-22	§ 103 – R2-105472, “ASN.1 Structure for SCell Configuration,” Nokia (“Nokia”) (Ex. 1004).
4	1-22	§ 103 – R2-105685, “Physical Layer Parameters to be Configured by RRC,” Ericsson (“Ericsson”) (Ex. 1005).

II. EDUCATIONAL BACKGROUND AND QUALIFICATIONS

4. I have briefly summarized in this section my educational background, career history, publications, and other relevant qualifications. I understand my full *curriculum vitae* is being submitted as Ex. 1003 to this proceeding.

5. My educational background, career history, publications, and other relevant qualifications provided here are only a summary.

6. Based on my education, research, and work experience, I am knowledgeable about the subject matter of the ’489 Patent and the related prior art.

7. I received a B.S. in electrical engineering from Rensselaer Polytechnic

Institute in 1987. I received an M.S. in electrical engineering from University of Massachusetts, Amherst in 1989. I received a Ph.D. in electrical engineering from the University of California, Los Angeles in 1997. My Ph.D. research was in the area of wireless communications.

8. I have over 25 years of experience working with wireless communications and IEEE standards and over 15 years of experience working in 802.11 WLAN chipsets and cellular base-station systems development.

9. A copy of my curriculum vitae listing my full employment history is included as Exhibit 1015. I will briefly summarize aspects of my experience below.

10. From 1989 through 1992, my work focused on radio frequency (RF) and microwave systems and circuit development for radar systems and cellular (mobile) radio. This work included my experience at AT&T Bell Laboratories with the development of the world's first commercial micro-cell and feed-forward amplifiers used in commercial cellular wireless base station equipment, the precursors to modern 3GPP systems.

11. From 1997 through 1999, I was employed by two Silicon Valley startup companies developing advanced digital communications technology for asymmetrical digital subscriber line (ADSL) and high bit-rate digital subscriber line (HDSL2) systems.

12. From 2000 through 2012, I was employed at Broadcom Corporation,

where I served as system engineer for the IEEE 802.11a/b/g wireless local area network chipsets including analysis of radio and baseband DSP architectures for the physical layer design, and then project manager and lead system engineer for the IEEE 802.11n proposal to the IEEE at Broadcom. My responsibilities focused on technology developments and contributions to a number of the IEEE 802.11 standards, and in particular the IEEE 802.11n standard which incorporated a MIMO-OFDM physical layer and enhanced MAC layer for higher throughput wireless networks. My work covered many topics including preamble design, advanced channel coding, channel estimation, and multiple antenna beamforming.

13. At Broadcom, I made significant technical contributions to multiple integrated circuit products, including the first commercially successful IEEE 802.11g chipsets. My contributions included signal processing algorithm development, digital hardware development, radio and system design, and software development. I participated in the design of the first commercially successful single chip CMOS wireless LAN, the first commercially successful MIMO wireless integrated circuit, early CMOS mmwave technology, channel coding, and multiple antenna beamforming research. I also developed technology for LTE baseband chipsets, including new techniques for digital pre-distortion.

14. I led standards participation efforts and made key contributions to multiple wireless standards that have been deployed in billions of products,

including IEEE 802.11n and Bluetooth v3.0. I made contributions to the IEEE for 802.11n both directly and through participation in the WWiSE Special Interest Group (SIG) and its proposal to the IEEE. My contributions encompassed preamble design, channel coding, beamforming, backward compatibility, and many other topics. My work at Broadcom resulted in more than one hundred issued patents in which I am a named inventor. A list of my patents is listed in my CV.

15. From June 2012 through July 2013, I was employed at Apple Inc., where I served as senior wireless system architect for analysis of the IEEE.11 wireless networks for iOS products.

16. From August 2013 to present, I have worked as a self-employed consultant while serving out my leadership role at the IEEE.

17. I am currently President of Covariant Corporation, which is a consulting firm that provides expertise on wireless communications, IEEE 802.11 standards and commercial product development

18. I am named inventor on more than 125 issued patents, including many standard essential patents for the IEEE 802.11 standards.

19. Over the past 30 years, I have worked on numerous projects and developed many technical skills. These include physical layer (PHY) algorithm development for both wireless and wireline communication systems, signal processing algorithm evaluation, channel code (convolutional and LDPC) analysis,

embedded software development, RF circuit and system design, and technical standards development. I have extensive knowledge of the theory and practice of IEEE 802.11 wireless networks at both the PHY and MAC layers as well as practical standards and product development experience with Bluetooth and 3GPP (LTE/NR) technologies. I write software code in Matlab, C, C++, and Python and hardware code in Verilog and VHDL. I actively maintain my skills through my consulting projects and standard participation activities.

20. My experience with cellular technology is extensive. It began with my work at Bell Laboratories on microcell and base station designs. These systems employed both legacy analog technology as well as the first TDMA and CDMA systems which pre-date the modern 3GPP standards. First deployed world-wide in 1991, they helped launch the modern wireless era.

21. I continued working on cellular technology as a graduate student at UCLA where I researched advanced wireless communication techniques including channel probing, and distributed power control. At Broadcom I researched baseband signal processing techniques for cellular chipsets and at Apple I investigated co-existence between cellular/LTE and W-Fi technologies. In my more recent consulting work, I have reviewed numerous 3GPP standards and investigated new wireless technology related to cellular systems.

22. My curriculum vitae provides additional information regarding my education, technical experience, and publications.

III. MATERIALS REVIEWED AND TIME OF INVENTION

23. The opinions contained in this Declaration are based on the documents that I reviewed, my professional judgment, as well as my education, experience, and knowledge regarding technologies related to the '489 Patent.

24. In forming my opinions expressed in this Declaration, I reviewed:

25. The '489 Patent (Ex. 1001);

26. File history of the '489 Patent (Ex. 1010);

27. R2-105472, "ASN.1 Structure for SCell Configuration," Nokia ("Nokia") (Ex. 1004);

28. R2-105685, "Physical Layer Parameters to be Configured by RRC," Ericsson ("Ericsson") (Ex. 1005);

29. 3GPP TS 36.331 v9.4.0 ("3GPP-36331-940") (Ex. 1006);

30. 3GPP TS 36.300 v9.5.0 ("3GPP-36300-950") (Ex. 1007);

31. R2-105971 ("3GPP-36331-Update") (Ex. 1008);

32. 3GPP TS 36.331 v10.0.0 (Ex. 1009);

33. "Overview of 3GPP LTE-Advanced Carrier Aggregation for 4G Wireless Communications," IEEE Communications Magazine (Feb. 2012) (Ex. 1014);

34. To the extent that they are not listed here, the exhibits relied upon in the 489 Petition; and

35. Any other materials that I refer to in this Declaration in support of my opinions.

36. I have been asked to consider the time of the invention to be around November 2, 2010, which I understand is the filing date of the application (U.S. Provisional Application No. 61/409,416, the '416 Provisional) to which the '489 Patent claims priority. Ex. 1001, Cover. My opinions reflect how a person of ordinary skill in the art (as I define in Section V below) would have understood the claims and the specification of the '489 Patent, the prior art to the '489 Patent, and the state of the art, at the time of the alleged invention.

IV. LEGAL STANDARDS

1. Overview

37. I am not an attorney or a legal expert, and I do not opine on matters of law. All the legal standards, which are listed in this section and which I applied in reaching the conclusions expressed throughout this Declaration, were provided to me by counsel. In preparing this Declaration, I have endeavored to faithfully apply these legal standards. I do not intend to offer opinions on the law. Below, I describe the law that I applied in analyzing the claims of the '489 Patent.

38. I have been informed by counsel that an issued patent is presumed

valid and that the challenger of a patent's validity bears the burden of proving invalidity of the patent.

2. Patent Claims

39. I have been informed by counsel that a patent's claims describe the invention made by the inventors and describe what the patent owner owns and what the owner may prevent others from doing.

40. I have been informed by counsel that claims may describe products, such as machines or chemical compounds, or processes for making or using a product. Claims are usually divided into parts or steps called limitations.

41. I have been informed by counsel that there are two types of claims: independent claims and dependent claims. An independent claim sets forth all the requirements that must be met in order to be covered by that claim. Thus, it is not necessary to look at any other claim to determine what an independent claim covers. A dependent claim does not itself recite all of the requirements of the claim, but refers to another claim for some of its requirements. In this way, a dependent claim depends on another claim. The law considers a dependent claim to incorporate all of the requirements of the claims to which it refers.

42. I have been informed by counsel that that a dependent claim then adds its own additional requirements. To determine what a dependent claim covers, it is necessary to look at both the dependent claim and any other claims to which it refers.

43. I have been informed by counsel that in a case where a dependent claim incorporates the limitations of an independent claim upon which it depends, if a reference fails to disclose any of the limitations of the independent claim, the claims which depend on that independent claim cannot be made invalid by such a reference. As a result, any of the references at issue in this proceeding that fail to disclose all of the limitations of an independent claim necessarily also fail to disclose all of the limitations of claims which depend on that independent claim.

3. Burden of Proof for Invalidity

44. I have been informed by counsel and I understand that the party challenging the validity of an issued U.S. patent in an IPR bears the burden of proving invalidity through facts supported by a preponderance of the evidence. I have been informed that a “preponderance of the evidence” means evidence sufficient to prove that a fact is more likely true than it is not.

4. Claim Construction

45. I have been informed by counsel and I understand that the first step in determining validity is to properly construe the claims. I have further been informed by counsel that, in this proceeding, the Board must determine the scope of the claims by using the same claim construction standard that United States District Courts use. Under this standard, the words of a claim are given their “ordinary” and “customary” meaning as would have been understood by a person of ordinary skill in the art at

the time of the invention. I have been informed that such a person looks to the claims, specification, and file history in understanding the meaning of the claim terms. I have applied this understanding in this Declaration.

5. Person of Ordinary Skill in the Art

46. I have been informed by counsel and I understand that a person having ordinary skill in the art may be defined by factors such as, when considered at the time of the alleged invention: (a) the levels of education and experience of the inventor and other persons actively involved in the field; (b) the types of problems encountered in the field; (c) prior art solutions to those problems; (d) rapidity with which innovations are made; and (e) the sophistication of the technology.

6. Anticipation

47. I have been informed by counsel and I understand that a patent claim can be found invalid as anticipated if each and every element of the claim, as properly construed, is found either explicitly or inherently in a single prior art reference. If the single prior art reference does not disclose explicitly or inherently any one claim limitation, then that claim is not anticipated. I have further been informed that the single prior art reference cannot merely disclose each element; rather, it must disclose all of the elements as arranged in the claim. I have been informed that for a prior art reference to “inherently” disclose something, the reference must necessarily function in accordance with, or include the claimed

limitations, to anticipate. The missing descriptive matter cannot merely probably or possibly include the claimed limitations. I have further been informed by counsel that, with respect to an anticipation analysis, it is improper to combine separate, distinct embodiments of a single prior art reference.

48. I have been informed that for a reference to be anticipatory, the reference must contain an enabling disclosure. I have been informed that merely naming or describing the subject matter is insufficient if it cannot be produced without undue experimentation.

7. Obviousness

49. I have been informed by counsel that a patent claim can be found invalid as obvious if the differences between the claim and the prior art references would have been obvious to a person of ordinary skill in the art at the time of the invention, taking into account (1) the scope and content of the prior art, (2) the differences between the prior art and the claims, (3) the level of ordinary skill in the art, and (4) any objective indicia of non-obviousness. I have further been informed by counsel that a claim can be found to be obvious in light of either a single prior art reference or multiple prior art references. I have been informed that references qualify as prior art for an obviousness determination only when they are analogous to the claimed invention. Two separate tests define the scope of analogous prior art: (1) whether the art is from the same field of endeavor, regardless of the problem

addressed; and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.

50. I have been informed that to be obvious in light of a single prior art reference or multiple prior art references, there must be a reason either to modify the single prior art reference or to combine the two or more prior art references to achieve the claimed invention. I have been informed by counsel that this reason may come from a teaching, suggestion, or motivation to combine which may come from the reference or references themselves, the knowledge or "common sense" of one skilled in the art, or from the nature of the problem to be solved, and may be explicit or implicit from the prior art as a whole.

51. I have been informed by counsel that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.

52. I have further been informed by counsel that there is no suggestion to combine, however, if a reference teaches away from its combination with another source. A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant, or if it suggests that the line of development flowing from the

reference's disclosure is unlikely to be productive of the result sought by the applicant. If, when combined, the references would produce a seemingly inoperative device, then they teach away from their combination. I have been informed that it is improper to combine references where the references teach away from their combination.

53. I have been informed by counsel that the degree of teaching away will depend on the particular facts; in general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant. I have been informed that a reference teaches away, for example, if (1) the combination would produce a seemingly inoperative device, or (2) the references leave the impression that the product would not have the property sought by the applicant.

54. I have been informed by counsel that if the teachings of a prior art reference would lead one skilled in the art to make a modification that would render another prior art device inoperable, then such a modification would generally not be obvious. I have been informed that if a proposed modification would render the prior art device unsatisfactory for its intended purpose, then the proposed modification would generally not be obvious.

55. I have been informed by counsel that it is improper to use hindsight in making the obviousness determination.

56. I have been informed by counsel that some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness must be made. I have been informed that, for example, there may be no rational underpinning to support the legal conclusion of obviousness where systems are already complete and the party challenging validity seeks to mix and match components, which each exist in the separate systems, from these complete systems.

V. PERSON OF ORDINARY SKILL IN THE ART (POSITA)

57. Based on my review of the '489 Patent, the types of problems encountered in the art at and prior to the time of the alleged invention, prior solutions to those problems, the pace with which innovations were made during the relevant time period, the sophistication of the technology, and the educational level of active professionals in the field, I believe that a person of ordinary skill in the art, at the time of the invention, would have had at least a Bachelor's degree in electrical engineering or a related field; and at least three years of work experience in design, development, and/or testing of telecommunication systems. A POSITA would also have familiarity with the wireless standards and well-known protocols for accessing wireless networks. More education could have substituted for less work experience and vice versa.

VI. CLAIM CONSTRUCTION

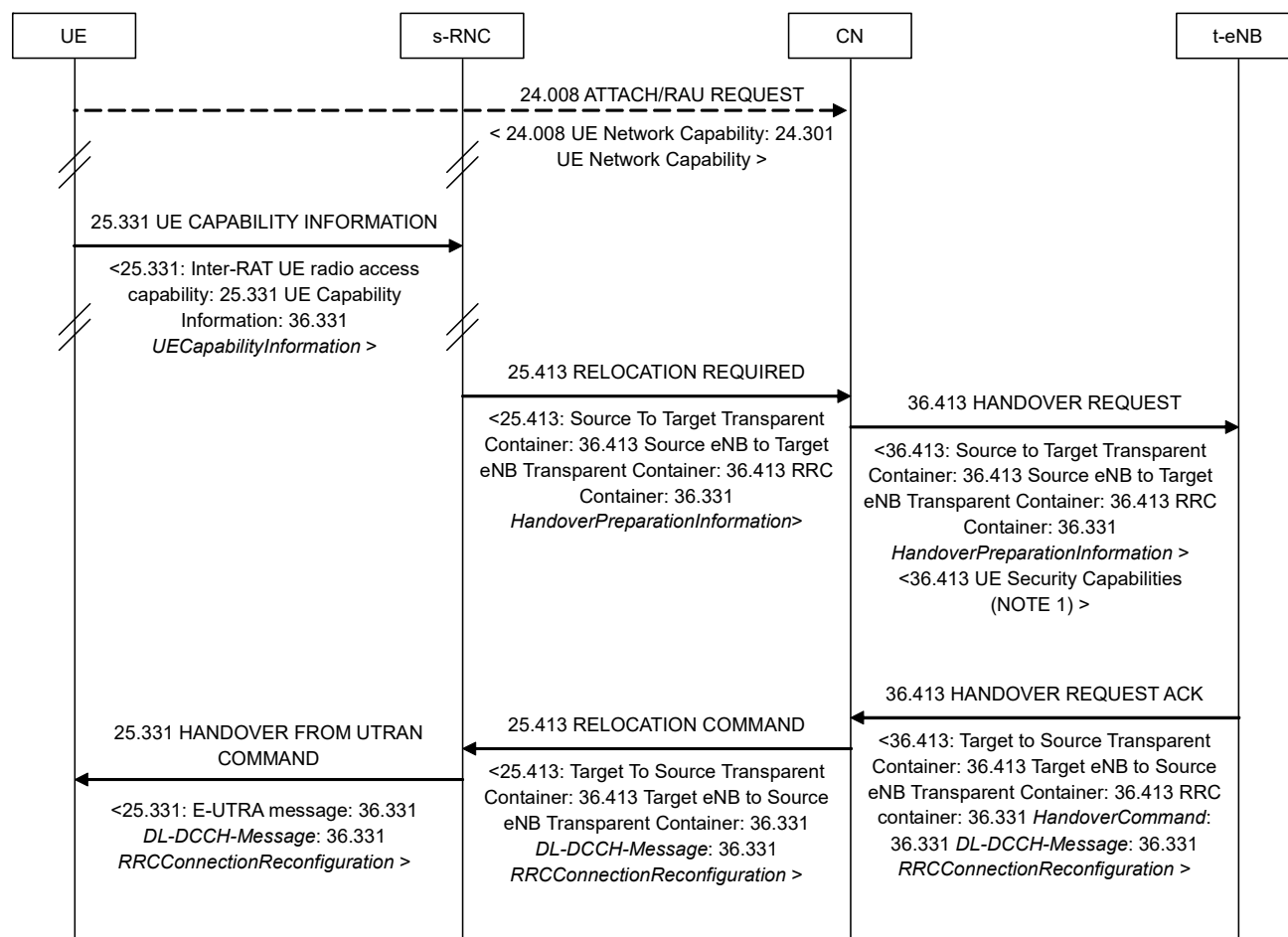
58. I understand that claim terms are typically given their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art at the time of the alleged invention. In considering the meaning of the claims, I also understand that one must consider the claim language, specification, prosecution history, and the knowledge of a person of ordinary skill in the art at the relevant time.

59. In my opinion, all terms should be given their ordinary and customary meaning. I applied this understanding in my analysis.

VII. BACKGROUND OF THE RELEVANT TECHNOLOGY

60. The '489 patent relates to a method for secondary cell (“SCell”) release during handover in a wireless communication system. Handover is a process wherein a User Equipment (“UE”) (e.g., a cell phone) leaves the range of one base station (“eNB”) and enters the range of another, such that the UE and its individual configurations must be seamlessly “handed over” from the “source” eNB to the “target” eNB. The procedure for handover is largely determined by the 3rd Generation Partnership Project (3GPP), a standard written by a collaboration of organizations that develop and maintain standards for mobile telecommunications. The relevant standards will be discussed further below, but in summary they are 3GPP-36331-940, 3GPP-36300-950, and 3GPP-36331-Update. These standards are

periodically updated through a series of meetings, which include working drafts capturing the updates that will eventually be adopted into the standards (for example, GPP-36331-Update). Figure 19.2.2.5.6-2 of the wireless telecommunications technical standard at the time of the invention, 3GPP-36300-950, below, provides a general background of the handover procedure.



NOTE 1: The information included in this IE is derived from the information provided in the "UE Network Capability" IE during network attach / RAU

61. A handover is initiated by a handover request from the source eNB to the target eNB. The request includes a HandoverPreparationInformation message that contains the Radio Resource Control information required for successful

handover. Following reception of the handover request, the target eNB sends a handover request acknowledgement of a handover command to the source eNB. That handover command includes a command to modify an RRC connection called the `RRCConnectionReconfiguration` message. The `RRCConnectionReconfiguration` message is passively transported from the source eNB to the UE.

62. Upon reception of the `RRCConnectionReconfiguration` message by the UE, the UE shall perform the radio resource configuration procedures outlined by the `RRCConnectionReconfiguration` message, including SCell release. Ex. 1014, 124. SCells are cells that can be used to provide additional radio resources as part of carrier aggregation.

63. Upon receipt of the `RRCConnectionReconfiguration` message, the UE undergoes the following procedure for SCell release.

- 1> if the release is triggered by reception of the *sCellToReleaseList*:
 - 2> for each *sCellIndex* value included in the *sCellToReleaseList*:
 - 3> if the current UE configuration includes an SCell with value *sCellIndex*:
 - 4> release the SCell.
- 3GPP-36331-Update, § 5.3.10a.

VIII. THE '489 PATENT

64. '489 patent is titled "Method and apparatus for secondary cell release during handover in a wireless communication system" and provides a device and method for SCell release during handover. Ex.1001, Abstract. Claim 1 of the '489

patent recites the following²:

1. A method of Secondary Cell (SCell) release during handover comprising:

configuring at least one SCell by a source eNB to a User Equipment (UE); and

including information by the source eNB in a HandoverPreparationInformation message for a target eNB to control SCell release in the UE during a handover,

wherein the information indicates SCell indexes of all SCells configured to the UE before the handover, thereby allowing the target eNB to include a sCellToReleaseList with all the SCells configured to the UE in a handover command for the UE to release the SCells included in the sCellToReleaseList.

² I have been informed that Petitioners have reserved the right to challenge the validity of the '489 patent claims, including under Section 112 on the basis of written description, enablement, and definiteness.

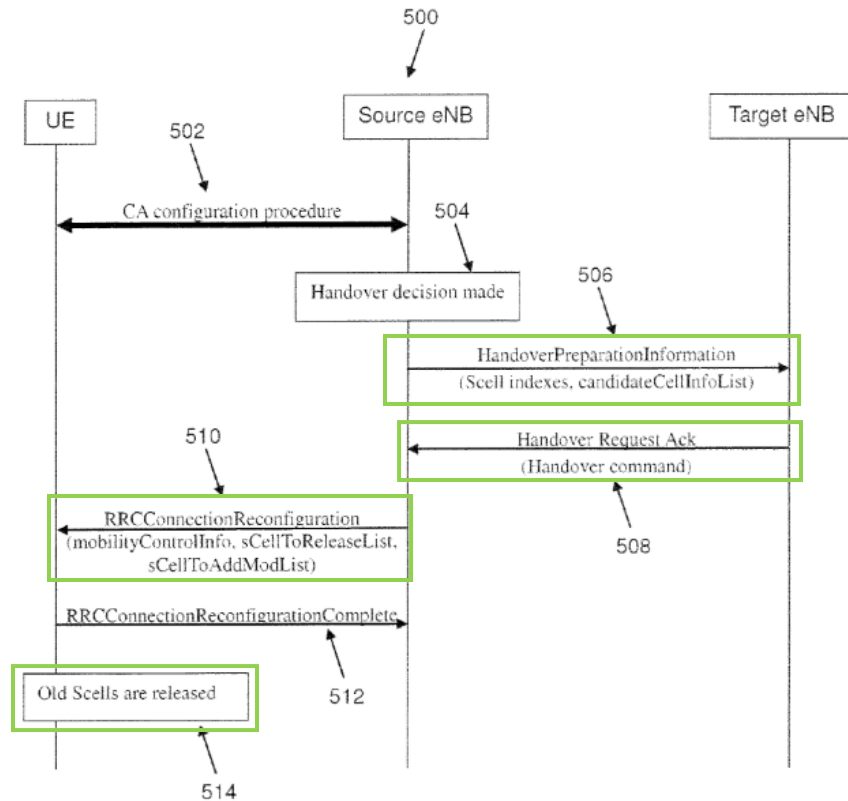


FIG. 6

65. Figure 6 (annotations added above) is an example of an embodiment of the purported invention. In particular, the '489 patent claims an implementation for SCell release during handover that involves transmitting a HandoverPreparationInformation message from the source eNB to the target eNB (step 506), wherein the HandoverPreparationInformation message indicates the SCell indexes of all the SCells configured to the UE. *Id.*, 7:15-23. After receiving the HandoverPreparationInformation message, the target eNB sends a handover command (step 508) including an RRCConnectionReconfiguration message with an “*SCelltoReleaseList*” to the UE (510). *Id.*, 7:24-27. The handover command is sent

by way of the source eNB and results with the UE releasing the SCells in the *SCellToReleaseList* (step 514). *Id.*, 7:30-36.

66. The concepts and properties claimed by the '489 patent (e.g., the HandoverPreparationInformation message, the SCell indexes, the *SCellToReleaseList*, the handover command, the RRCConnectionReconfiguration message, and the mobilitycontrolinfo) are all disclosed in the standards in place at the time of the invention, which are cited in the '489 patent specification.

67. The '489 patent specification describes a purported problem in the prior art that it is attempting to solve. It states that “currently there is no information included in RRCConnectionReconfiguration message for a UE to distinguish whether the handover is an intra-eNB or inter-eNB handover.” *Id.*, 6:45-48. As such, “the UE cannot decide whether or not to release the current SCells upon handover,” and therefore, “the target eNB has to include a *sCellToReleaseList* with all valid SCell indexes in the handover command for the UE to release all the potentially configured SCells even when there is actually no SCell configured to the UE.” *Id.*, 6:49-53.

68. The '489 patent goes on to state that “[c]urrently, there are 7 valid values of SCell indexes and the maximum number of SCell indexes in a *SCellToReleaseList* is only 4.” *Id.*, 6:54-56. Therefore, “[t]he handover command cannot include all the potential SCell Indexes which may be used in the UE” and

“one additional RRCConnectionReconfiguration message is needed to release all the SCells in the UE,” which may result in increased signaling overhead. *Id.*, 6:56-59.

69. As a solution to this problem, the '489 patent purports to include information in the HandoverPreparationInformation message that “indicates the SCell indexes of all the SCells configured to the concerned UE, thereby allowing the target eNB to include the *sCellToReleaseList* with the SCells configured to the UE in the RRCConnectionReconfiguration message so that the UE can release the SCell(s) according to the *sCellToReleaseList*.” *Id.*, 6:65-7:4.

IX. PROSECUTION HISTORY OF THE '489 PATENT

70. I understand that the history of a patent's prosecution can impact the way the claims are interpreted after allowance. Prior to allowance, the Examiner found the claims obvious in view of three references: R2-104791 (Ex. 1011); R2-104991 (Ex. 1012); and R2-104421 (Ex. 1013). Ex. 1010, 50-54. In response, the Patent Owner did not assert that the prior art failed to disclose the claimed method for secondary cell release. *Id.*, 36-41. It instead amended the claims as illustrated below:

IN THE CLAIMS:

1. (Currently Amended) A method of Secondary Cell (SCell) release during handover comprising:
configuring at least one SCell by a source eNB to a User Equipment (UE); and
including information by the source eNB in a *HandoverPreparationInformation* message for a target eNB to control SCell release in the UE during a handover,
wherein the information indicates SCell indexes of all SCells configured to the UE before the handover, thereby allowing the target eNB to include a *sCellToReleaseList* with all the SCells configured to the UE in a handover command for the UE to release the SCells included in the *sCellToReleaseList*.

71. Patent Owner argued that the amendment to the claim “indicates all SCells that are configured to the UE by the source eNB *before* handover and that are to be released by the UE due to the handover, while the list in R2-104791 indicates candidate SCells to be configured to the UE *for use after handover*.” Ex. 1010, 37. In particular, Patent Owner argued that the prior art disclosed a “candidate list [that] indicates SCells to be configured for use after handover,” as opposed to the newly amended independent claims that require an indication of “SCells configured to the UE by a source eNB before handover and to be released by the UE due to handover.” Ex. 1010, 40.

72. This was the sole distinction provided by Patent Owner to overcome the prior art asserted by the Examiner. The Examiner then allowed the claims without further comment. *Id.*, 11. The Nokia and Ericsson references discussed herein were not before the Patent Office. As explained above, the relevant 3GPP

standards in place at the time of the invention are reflected in 3GPP TS 36.331 v9.4.0 (3GPP-36331-940), 3GPP TS. 36.300 v9.5.0 (3GPP-36300-950), and R2-105971(3GPP-36331-Update), which are referenced as such in the specification of the '489 patent ('489 patent, 2:21-27).

X. THE PRIOR ART REFERENCES

1. R2-105472 (“Nokia”)

73. R2-105472 (“Nokia”) is a proposal submitted by Nokia Siemens Networks, Nokia Corporation titled “ASN.1 Structure for SCell Configuration.” Nokia, 1. Nokia was submitted for discussion at the 3GPP TSG-RAN WG2 Meeting #71bis in Xian, China, which met between October 11, 2010 and October 15, 2010. *Id.* I understand that R2-105472 therefore qualifies as prior art under, at least, 35 U.S.C. 102(a). *See also*, Ex. 1003, ¶ 86.

74. Nokia was a contribution to the 3GPP technical standard, TS 36.331 version 9.4.0. In particular, Nokia discusses SCell configuration parameter grouping and providing SCell configuration parameters under *radioResourceConfigDedicated*. Nokia 1. Nokia teaches to include information elements; for example, Nokia teaches to include an index of SCells configured to the UE as well as the *SCelltoReleaseList* in the *RadioResourceConfigDedicated* IE, which, as explained in Sections XII.1.c-d below, is included in the as-Config IE of the HandoverPreparationInformation message before handover. *Id.* 6-8.

2. R2-105685 (“Ericsson”)

75. R2-105685 (“Ericsson”) is a proposal submitted by Ericsson, ST-Ericsson titled “Physical layer parameters to be configured by RRC.” Ericsson,1. Ericsson was submitted for discussion at the 3GPP TSG-RAN WG2 Meeting #71bis in Xian, China, which met between October 11, 2010 and October 15, 2010. *Id.* I understand that Ericsson is therefore prior art under, at least, 35 U.S.C. 102(a). *See also*, Ex. 1003, ¶ 87.

76. Ericsson was a contribution to the 3GPP technical standard, TS 36.331 version 9.4.0. Ericsson,1. In relevant part, Ericsson discusses SCell radio configurations and provides SCell configuration parameters under *radioResourceConfigDedicatedSCell*. Ericsson,2, 6, 9. Ericsson teaches to include information elements; for example, Ericsson teaches to include an index of P and SCells configured to the UE as part of the *RadioResourceConfigDedicatedSCell* IE, which, as explained in Section XIII.1.c below, is included in the *as-Config* IE of the *HandoverPreparationInformation* message before handover. *Id.*

XI. THE 3GPP-STANDARD: 3GPP-36331-940, 3GPP-36300-950, AND 3GPP-36331-UPDATE

77. A POSITA would understand that at the time of invention, the 3GPP family of standards included many technical specifications, including 3GPP-36331-940 and 3GPP-36300-950. Furthermore, the POSITA would understand that these specifications are intended to be used together and outline the procedures used for

cellular configuration during the handover of a UE between one eNB and another.

78. Furthermore, a POSITA would understand that 3GPP-36331-Update is a draft that provides updates to 3GPP-36331-940, and that once approved, these updates would appear in a future version, such as TS 36.331 v10.0.0.

1. 3GPP-36331-940

79. 3GPP-36331-940 (Ex. 1006) is a technical specification produced by the 3rd Generation Partnership Project (3GPP), version 9.4.0 of the 9th release of the standard. In particular, the technical specification specifies the Radio Resource Control protocol for the UE-E-UTRAN radio interface. It also describes the radio related information transported between source eNB and target eNB during handover. 3GPP-36331-940 was well known to POSITAs at the time of the '489 Patent. In fact, the '489 Patent references the 3GPP-36331-940 standard. Ex. 1001, 2:25.

2. 3GPP-36300-950

80. 3GPP-36300-950 (EX. 1007) is a technical specification produced by the 3rd Generation Partnership Project (3GPP), version 9.5.0 of the 9th release of the standard. In particular, the technical specification specifies the Radio Resource Control protocol for the UE-E-UTRAN radio interface. It also describes the radio related information transported between source eNB and target eNB during handover. 3GPP-36300-950 was well known to POSITAs at the time of the '489

Patent. In fact, the '489 Patent references the 3GPP-36300-950 standard. Ex. 1001, 2:26.

3. R2-105971 (“3GPP-36331-Update ”)

81. R2-105971 (“3GPP-36331-Update ”) is a change request to TS 36.331 v9.4.0 submitted by Samsung titled “Introduction of Carrier Aggregation and UL/DL MIMO.” 3GPP-36331-Update, 1. In short, Samsung was tasked with (1) keeping track of the agreed-upon contributions by the organizations drafting the 3GPP standard; and (2) implementing the contributions into the appropriate sections of the standard. The change request resulting from Samsung’s implementations of the organizations’ contributions was R2-105971. 3GPP-36331-Update was agreed upon and adopted into the standard at the 3GPP TSG-RAN WG2 Meeting #71bis in Xian, China, which met between October 11, 2010 and October 15, 2010. See R2-106929, Annex G; *see also* '489 patent, 2:21-27. Samsung’s contributions were captured in release 10 of the standard (TS. 36.331 v10.0.0). 3GPP-36331-Update was well known to POSITAs at the time of the '489 Patent. In fact, the '489 Patent references 3GPP-36331-Update . Ex. 1001, 2:26.

82. 3GPP-36331-Update is related to carrier aggregation and discloses the procedures and parameters for SCell release during handover, including by providing SCell configuration information in IEs to the HandoverPreparationInformation message and by providing SCell configuration

information to the UE in a handover command and RRCConnectionReconfiguration message.

XII. GROUND 1: NOKIA IN VIEW OF THE 3GPP-STANDARD RENDERS CLAIMS 1-22 OBVIOUS

83. The Challenged Claims would have been obvious at the time of the invention to a POSITA based on Nokia in view of the knowledge of a POSITA and the 3GPP-Standard (i.e., 3GPP-36331-940, 3GPP-36300-950, and 3GPP-36331-Update) for the reasons provided below.

1. Claim 1

a. “A method of Secondary Cell (SCell) release during handover comprising:”

84. I understand that preambles are sometimes limiting. To the extent the preamble of claim 1 is limiting, A POSITA would have understood that the prior art (in this case, 3GPP-36331-Update) discloses the preamble. For example, the summary of change discloses that the change request includes changes related to secondary cell release. *See, e.g.*, Ex. 1008, 1.

85. In a second example, 3GPP-36331-Update discloses configuration parameters, including an “introduction of top level fields within the reconfiguration message to support addition/ modification and release of secondary cells.” *See, e.g.*, Ex. 1008, 1-2. Samsung further discloses an RRC Connection Reconfiguration procedure, wherein one purpose of the RRC Connection Reconfiguration procedure is to “add/modify/release SCells.” *See, e.g.*, Ex. 1008, § 5.3.5.1.

86. 3GPP-36331-Update also discloses that when “the received *RRCConnectionReconfiguration* includes the *sCellToReleaseList*,” it will “perform SCell release as specified in 5.3.10.3a.” *See, e.g.*, Ex. 1008, §§ 5.3.5.3, 5.4.5.4. 3GPP-36331-Update goes on to outline a method for SCell release. *See, e.g.*, Ex. 1008, § 5.3.10.3a.

b. “configuring at least one SCell by a source eNB to a User Equipment (UE); and”

87. A POSITA would have understood that the prior art (in this case, 3GPP-36331-Update) discloses the present claim limitation. 3GPP-36331-Update discloses that E-UTRAN (that is, the source eNB) “may configure a UE that supports Carrier Aggregation, with one or more SCells in addition to the PCell that is initially configured during connection establishment.” *See, e.g.*, Ex. 1008, § 5.3.1.1.

88. 3GPP-36331-Update further discloses that E-UTRAN (that is, the source eNB) “can independently add, remove or modify SCells by means of the RRC connection reconfiguration procedure using the *RRCConnectionReconfiguration* message.” *See, e.g.*, Ex. 1008, § 5.3.1.3.

89. 3GPP-36331-Update further discloses that the source eNB configures the UE via the RRC protocol. *See, e.g.*, Ex. 1008, § 5.3.1.3, § 5.3.10.3a.

90. 3GPP-36331-Update further discloses that the source eNB controls the RRC connection reconfiguration procedure whose purpose is “to modify an RRC connection, e.g. to establish/ modify/ release RBs, to perform handover, to setup/

modify/ release measurements, to add/ modify/ release SCells.” *See, e.g.*, Ex. 1008, § 5.3.5.1, § 5.4.2.3, § 6.2.2, Fig. 5.3.5.1-1.

91. A POSITA would understand that the E-UTRAN configuring the UE with one or more SCells discloses the present claim limitation. A POSITA would understand that the E-UTRAN is a network of eNBs, and that the E-UTRAN is responsible for a radio resource functions including the allocation of radio resources to each UE. Thus, POSITA would understand that the E-UTRAN configuring the UE with one or more SCells would necessarily include the configuring of at least one SCell by a source eNB to a UE.

c. **“including information by the source eNB in a HandoverPreparationInformation message for a target eNB to control SCell release in the UE during a handover,”**

92. Nokia in view of the 3GPP-Standard (in this case, TS 36.331 v9.4.0 and 3GPP-36331-Update) discloses the present claim limitation. TS 36.331 v9.4.0 discloses a “HandoverPreparationInformation message” from the “source eNB” to the “target eNB.” *See, e.g.*, TS 36.331 v9.4.0, pg. 216. The “HandoverPreparationInformation message” is “used to transfer the E-UTRA RRC information used by the target eNB during handover preparation, including UE capability information.” *Id.*

93. The “HandoverPreparationInformation message” includes several types of information elements, or “IEs,” as described in the standard and illustrated

below.

***HandoverPreparationInformation* message**

```
-- ASN1START

HandoverPreparationInformation ::= SEQUENCE {
    criticalExtensions      CHOICE {
        c1                  CHOICE{
            handoverPreparationInformation-r8  HandoverPreparationInformation-r8-IEs,
            spare7 NULL,
            spare6 NULL, spare5 NULL, spare4 NULL,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture      SEQUENCE {}
    }
}

HandoverPreparationInformation-r8-IEs ::= SEQUENCE {
    ue-RadioAccessCapabilityInfo    UE-CapabilityRAT-ContainerList,
    as-Config                        AS-Config                OPTIONAL,      -- Cond HO
    rrm-Config                       RRM-Config                OPTIONAL,
    as-Context                        AS-Context                OPTIONAL,      -- Cond HO
    nonCriticalExtension              HandoverPreparationInformation-v920-IEs  OPTIONAL
}

HandoverPreparationInformation-v920-IEs ::= SEQUENCE {
    ue-ConfigRelease-r9              ENUMERATED {
        rel9, spare7, spare6, spare5, spare4, spare3,
        spare2, spare1, ...}          OPTIONAL,      -- Cond HO2
    nonCriticalExtension              SEQUENCE {}          OPTIONAL
}

-- ASN1STOP
```

Id., pgs. 216-217 (annotated). The “HandoverPreparationInformation message” includes the as-Config IE. *Id.*, pg. 216. The as-Config IE “contains information about RRC configuration information in the source cell which can be utilized by target cell to determine the need to change the RRC configuration during the handover preparation phase.” *Id.*, pg. 218.

94. The as-Config IE includes radio resource configuration IEs, including the RadioResourceConfigDedicated IE, as illustrated below.

AS-Config information element

```
-- ASN1START
AS-Config ::= SEQUENCE {
    sourceMeasConfig           MeasConfig,
    sourceRadioResourceConfig  RadioResourceConfigDedicated,
    sourceSecurityAlgorithmConfig SecurityAlgorithmConfig,
    sourceUE-Identity          C-RNTI,
    sourceMasterInformationBlock MasterInformationBlock,
    sourceSystemInformationBlockType1 SystemInformationBlockType1(WITH COMPONENTS
    | {..., nonCriticalExtension ABSENT}),
    sourceSystemInformationBlockType2 SystemInformationBlockType2,
    antennaInfoCommon          AntennaInfoCommon,
    sourceDl-CarrierFreq        ARFCN-ValueEUTRA,
    ...,
    [ sourceSystemInformationBlockType1Ext OCTET STRING (CONTAINING
    | SystemInformationBlockType1-v890-IEs) OPTIONAL,
    sourceOtherConfig-r9            OtherConfig-r9
  ]
}
-- ASN1STOP
```

Id., pg. 218 (annotated). The above IEs (including the as-Config IE and RadioResourceConfigDedicated IE) are all included in the HandoverPreparationInformation message. *Id.*, pg. 216.

95. Per 3GPP-36331-Update, the RadioResourceConfigDedicated IE “is used to setup/modify/release RBs, to modify the MAC main configuration, to modify the SPS configuration and to modify dedicated physical configuration.” Ex. 1008, § 6.3.2; EX1006, § 6.3.2. The RadioResourceConfigDedicated IE is the appropriate location for information related to controlling SCell release, and a target eNB would look to the RadioResourceConfigDedicated IE within the HandoverPreparationInformation message for the information required to perform SCell release. Ex. 1008, § 6.3.2. Therefore, a POSITA would have understood that the prior art (in this case, 3GPP-36331-Update) discloses “including information by the source eNB in a HandoverPreparationInformation message for a target eNB to

control SCell release in the UE during a handover.”

96. In support of that point, 3GPP-36331-Update includes the RadioResourceConfigDedicatedSCell IE as part of the RadioResourceConfigDedicated IE. As illustrated in the below figure, RadioResourceConfigDedicatedSCell includes “UE specific configuration extensions applicable for an SCell.” *Id.*

RadioResourceConfigDedicated information element

```
-- ASN1START
RadioResourceConfigDedicated ::= SEQUENCE {
    srb-ToAddModList          SRB-ToAddModList          OPTIONAL,      -- Cond HO-Conn
    drb-ToAddModList          DRB-ToAddModList          OPTIONAL,      -- Cond HO-
toEUTRA
    drb-ToReleaseList         DRB-ToReleaseList         OPTIONAL,      -- Need ON
    mac-MainConfig            CHOICE {
        explicitValue         MAC-MainConfig,|
        defaultValue          NULL
    } OPTIONAL,      -- Cond HO-
toEUTRA2
    sps-Config                SPS-Config                OPTIONAL,      -- Need ON
    physicalConfigDedicated   PhysicalConfigDedicated   OPTIONAL,      -- Need ON
    ...,
    [[ rlf-TimersAndConstants-r9      RLF-TimersAndConstants-r9      OPTIONAL      -- Need ON
    ]]
}

RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {
    -- UE specific configuration extensions applicable for an SCell
```

Id. (annotated). The RadioResourceConfigDedicatedSCell IE was a new contribution to the standard (TS 36.331 v9.4.0) included in 3GPP-36331-Update and adopted into the subsequent standard (TS 36.331 v10.0.0). As part of the RadioResourceConfigDedicated IE that “is used to setup/modify/release RBs, to modify the MAC main configuration, to modify the SPS configuration and to modify dedicated physical configuration” (Ex. 1008, § 6.3.2), a POSITA would understand that the RadioResourceConfigDedicatedSCell IE therefore further includes

information “for a target eNB to control SCell release in the UE during handover,” as required by the present limitation. A POSITA would understand the RadioResourceConfigDedicatedSCell IE continues UE specific configurations for SCell, and that these configurations need to be determined by the E-UTRAN, including the target eNB, during a handover. A POSITA would also understand this information must then be communicated to the UE.

97. Furthermore, Nokia also discloses the present claim limitation. Nokia teaches that SCell parameters, including an account of all the SCells configured to the UE, should be referenced in RadioResourceConfigDedicated. *See* Nokia, pgs. 6-8. The parameters include SCell DL and UL parameters, e.g., physCellId and CarrierFreq reporting for configured SCells. *Id.* The parameters further include the secCellIndex (which is functionally identical to the claimed *SCellIndex*) and ServCellIndex. *Id.* The parameters are transferred to the target eNB, and the target eNB may use the parameters to control SCell Release. *Id.* The eNB looks to the RadioResourceConfigDedicated IE for the parameters for SCell release because including parameters for SCell release is one of the purposes of the RadioResourceConfigDedicated IE in the standard. Ex. 1008, § 6.3.2; Ex. 1006, § 6.3.2. These parameters include information “for a target eNB to control SCell release in the UE during handover,” as required by the present claim limitation.

- d. “wherein the information indicates SCell indexes of all SCells configured to the UE before the handover, thereby allowing the target eNB to include a *sCellToReleaseList* with all the SCells configured to the UE in a handover command for the UE to release the SCells included in the *sCellToReleaseList*.”

98. Nokia in view of the 3GPP-Standard discloses the present claim limitation. As described with respect to limitation [1c] above, the HandoverPreparationInformation message includes the as-Config IE, which includes the RadioResourceConfigDedicated IE. *See* Section XII.1.c. This information is sent from the source eNB to the target eNB before handover. It provides the necessary information for the target eNB to perform the handover procedure, including SCell release. *Id.*

99. Nokia teaches that the information in the HandoverPreparationInformation message “indicates SCell indexes of all SCells configured to the UE before the handover.” Nokia further teaches that SCell parameters (including an account of all the SCells configured to the UE) should be referenced in the RadioResourceConfigDedicated IE. *See* Nokia, 6-8. The parameters include SCell DL and UL parameters (e.g., physCellId and CarrierFreq) reporting for configured SCells. *Id.* The parameters further include the secCellIndex (which is functionally identical to the claimed *SCellIndex*) and ServCellIndex as part of the SecCelltoAddMod IE. *Id.*

100. These parameters indicate the “SCell indexes of all SCells configured

to the UE before the handover,” as required by the present claim limitation.

101. RadioResourceConfigDedicated IE also includes the claimed *SCelltoReleaseList*, as illustrated below. The SecCell-toReleaseList corresponds to and is functionally identical to the claimed *SCelltoReleaseList*.

```
SecCell-ToReleaseList-r10 ::= SEQUENCE (SIZE (1..maxSecCell-r10)) OF CellIndex-r10
CIF ::= INTEGER (1..7)
-- Do we need to fix Scheduling Cell = CIF-DL (0)? Different CIF for UL and DL?
-- ASN1STOP
```

Nokia, pg. 8 (annotated). Nokia states that the SecCell-ToReleaseList includes SCell values from 1 to the maxSecCell of the CellIndex. Nokia, pg. 8. As described in 3GPP-36331-Update, the CellIndex ranges from 1 to maxCellmeas, corresponding to the maximum number of entries of cells (i.e., PCells and SCells). *Id.*, § 6.3.4. The CIF value allocation for the scheduled SCell ranges from 1 to 7 (Nokia, pg. 3), which correlates with the SCellIndex integer value as described by 3GPP-36331-Update in § 6.3.4. Therefore, the CellIndex is an index that includes all the SCells configured to the UE prior to handover.

102. The SecCell-toReleaseList includes SCell values up to the maxSecCell of the CellIndex. *Id.* The maxSecCell corresponds to and is functionally identical to the maxSCell in 3GPP-36331-Update and represents the maximum number of SCells that may be configured to a UE. Ex. 1008, § 6.4. As such, the SecCell-toReleaseList includes all of the SCells configured to the UE and provides information indicating “SCell indexes of all SCells configured to the UE before

handover,” as required by the present claim limitation. Furthermore, a POSITA would understand that the target eNB could simply use the SecCell-toReleaseList received from the source eNB to release all of the SCells configured to the UE during handover

103. Nokia further teaches that the RadioResourceConfigDedicated IE, as part of the as-Config IE of the HandoverPreparationInformation message, includes the ServCellIndex. Nokia, pgs. 6-8. The ServCellIndex incorporates the SCellIndex. *See* Ex. 1008, § 6.3.4 (“Value 0 applies for the PCell, while the SCellIndex that has previously been assigned applies for SCells”). The ServCellIndex (as part of the HandoverPreparationInformation message) is sent from the source eNB to the target eNB during handover preparation. TS 36.331 v9.4.0, pg. 216. Accordingly, it is sent *before* handover.

104. Because the ServCellIndex incorporates the SCellIndex values, it must include the SCell indexes of all SCells configured to the UE. 3GPP-36331-Update describes that “[f]or an UE configured with CA [(carrier aggregation)] the term 'serving cells' is used to denote the set of one or more cells comprising of the primary cell and *all secondary cells*”. Ex. 1008, § 3.1 (emphasis added).

105. Thus, the information in the ServCellIndex “indicates SCell indexes of all SCells configured to the UE before the handover” as required by the present claim limitation. Accordingly, Nokia discloses that “the information indicates SCell

indexes of all SCells configured to the UE before the handover.”

106. When the HandoverPreparationInformation message reaches the target eNB from the source eNB, it provides the target eNB with the “necessary information to prepare the HO at the target side,” including information from the as-Config IE (as explained above and in Section XII.1.c). TS 36.300 v9.5.0, pg. 49. Without that information, the target eNB cannot “generate[] the RRC message to perform the handover, i.e. *RRCConnectionReconfiguration* message including the *mobilityControlInformation*, to be sent by the source eNB towards the UE.” *Id.* Sending the HandoverPreparationInformation message with the information as described above allows “the target eNB to include a sCellToReleaseList with all the SCells configured to the UE in a handover command for the UE to release the SCells included in the sCellToReleaseList.”

107. The target eNB sends the RRCConnectionReconfiguration message as a HandoverCommand message. TS 36.331 v9.4.0, pg. 216. The HandoverCommand message “is used to transfer the handover command generated by the target eNB, which is transparently transferred by the source RAN to the UE.” *Id.*

108. The RRCConnectionReconfiguration message includes the sCellToReleaseList IE. Ex. 1008, § 6.2.2.

```
RRCConnectionReconfiguration-v10xy-IEs ::= SEQUENCE {  
    pCellIndex-r10                INTEGER (0),  
    sCellToReleaseList-r10         SCellToReleaseList-r10  
    sCellToAddModList-r10         SCellToAddModList-r10  
    nonCriticalExtension           SEQUENCE {}  
}
```

OPTIONAL,	-- Need ON
OPTIONAL,	-- Need ON
OPTIONAL	-- Need OP

Id. The *sCellToReleaseList* of the *RRCCConnectionReconfiguration* message includes all of the SCells configured to the UE.

```
SCellToReleaseList-r10 ::= SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellIndex-r10
```

Id. Therefore, the target eNB includes “a *sCellToReleaseList* with all the SCells configured to the UE in a handover command” as required by the present claim limitation.

109. 3GPP-36331-Update states that “if the received *RRCCConnectionReconfiguration* includes the *sCellToReleaseList*...perform SCell release as specified in 5.3.10.3a.” Ex. 1008, §§ 5.3.5.3, 5.3.5.4.

110. 3GPP-36331-Update also explains performance of SCell release by the UE upon reception of the *sCellToReleaseList*:

5.3.10.3a SCell release

The UE shall:

- 1> if the release is triggered by reception of the *sCellToReleaseList*:
- 2> for each *sCellIndex* value included in the *sCellToReleaseList*:
- 3> if the current UE configuration includes an SCell with value *sCellIndex*:
- 4> release the SCell;

Ex. 1008, § 5.3.10.3a. Thus, 3GPP-36331-Update teaches “the UE to release the SCells included in the *sCellToReleaseList*,” as required by the present claim limitation.

2. Claim 2

a. “The method of claim 1, wherein”

111. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 1 for the reasons stated above.

b. “the handover command corresponds to an RRCConnectionReconfiguration message including mobilityControlInfo.”

112. For the reasons expressed below, a POSITA would have understood that the prior art (in this case, 3GPP-36331-Update and TS 36.331 v9.4.0) discloses the present claim limitation. For example, as stated in TS 36.331 v9.4.0, the HandoverCommand is a message “used to transfer the handover command generated by the target eNB, which is transparently transferred by the source RAN to the UE.” Ex. 1006, 216.

113. The HandoverCommand includes the handoverCommandMessage IE, which “[c]ontains the entire DL-DCCH-Message including the RRCConnectionReconfiguration message used to perform handover to E-UTRAN, generated (entirely) by the target eNB.” *Id.*, 107; *see also*, Ex. 1008, § 6.2.2. Therefore, the handover command “corresponds to an RRCConnectionReconfiguration message” as required by the present claim limitation.

114. The RRCConnectionReconfiguration message further includes the mobilityControlInfo IE. *Id.*, 107.

RRCConnectionReconfiguration-r8-IEs ::= SEQUENCE {			
measConfig	MeasConfig	OPTIONAL,	-- Need ON
mobilityControlInfo	MobilityControlInfo	OPTIONAL,	-- Cond HO

115. Under the definition for the RRCConnectionReconfiguration message, it describes that the mobilityControlInfo IE is “mandatorily present” during inter-node handover and intra-node handover. *Id.*, pgs. 107-108; *see also*, Ex. 1008, § 6.2.2.

116. 3GPP-36331-Update also includes procedures for SCell release when the RRCConnectionReconfiguration message includes the mobilityControlInfo. Ex. 1008, §§ 5.3.5.4, 5.3.10.3a.

3. Claim 3

a. “The method of claim 2, wherein”

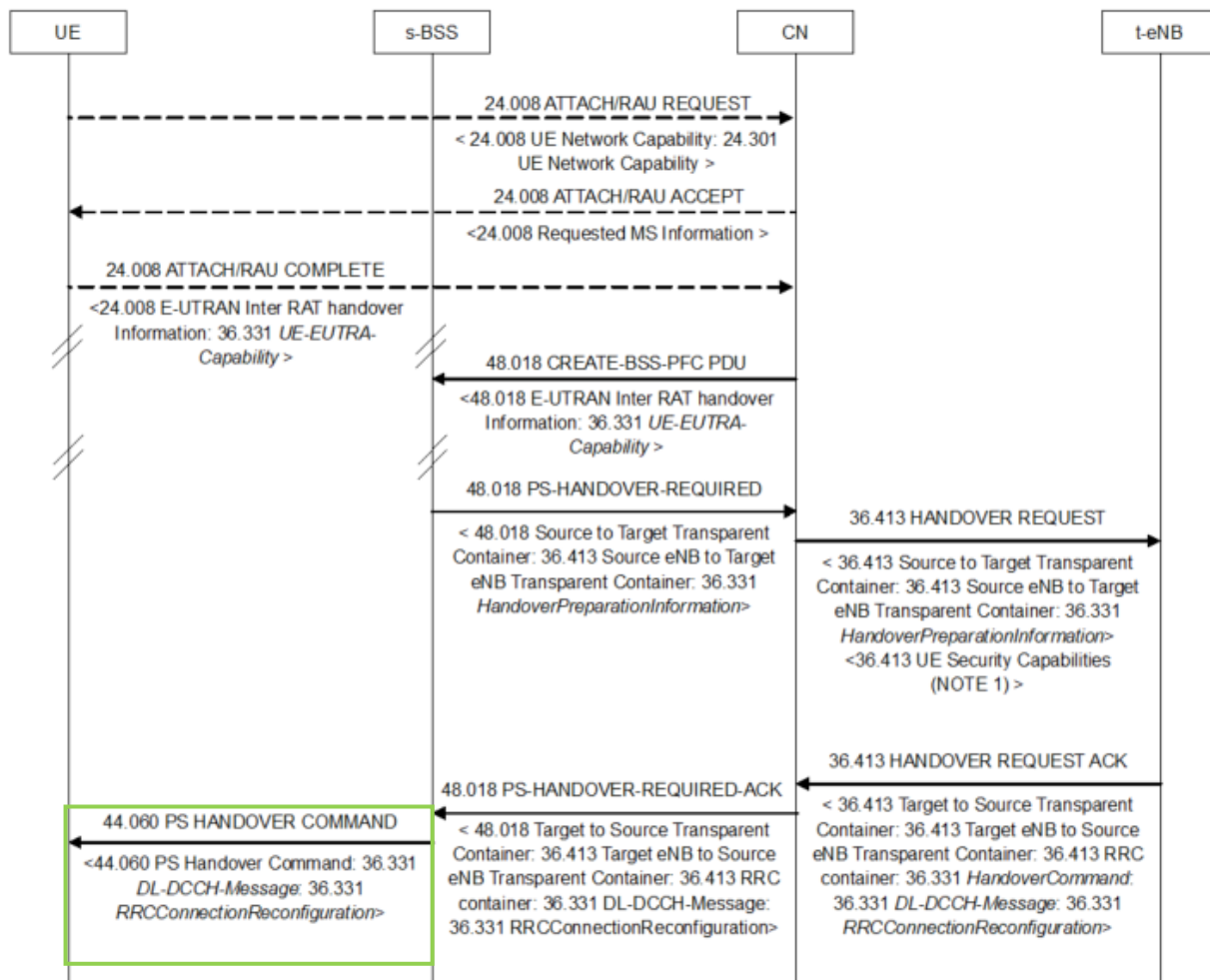
117. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 2 for the reasons stated above.

b. “the RRCConnectionReconfiguration message is sent from the source eNB to the UE to initiate a handover procedure.”

118. For the reasons expressed below, a POSITA would have understood that the prior art (in this case, 3GPP-36331-Update and TS 36.331 v9.4.0) discloses the present claim limitation. As discussed above, the HandoverCommand message includes the RRCConnectionReconfiguration message. *See* Section X.A.2. The HandoverCommand message is “used to transfer the handover command generated by the target eNB, which is transparently transferred by the source RAN to the UE.”

Ex. 1006, 216. Inter-node handover procedure is initiated by ending the RRCConnectionReconfiguration message. *Id.*, 58.

119. Furthermore, TS. 36.300 v9.5.0 discloses that the RRCConnectionReconfiguration message is sent from the source eNB to the UE as a HandoverCommand to initiate the handover procedure. Ex. 1007, 118.



Id., Figure 19.2.2.5.6-1 (annotated).

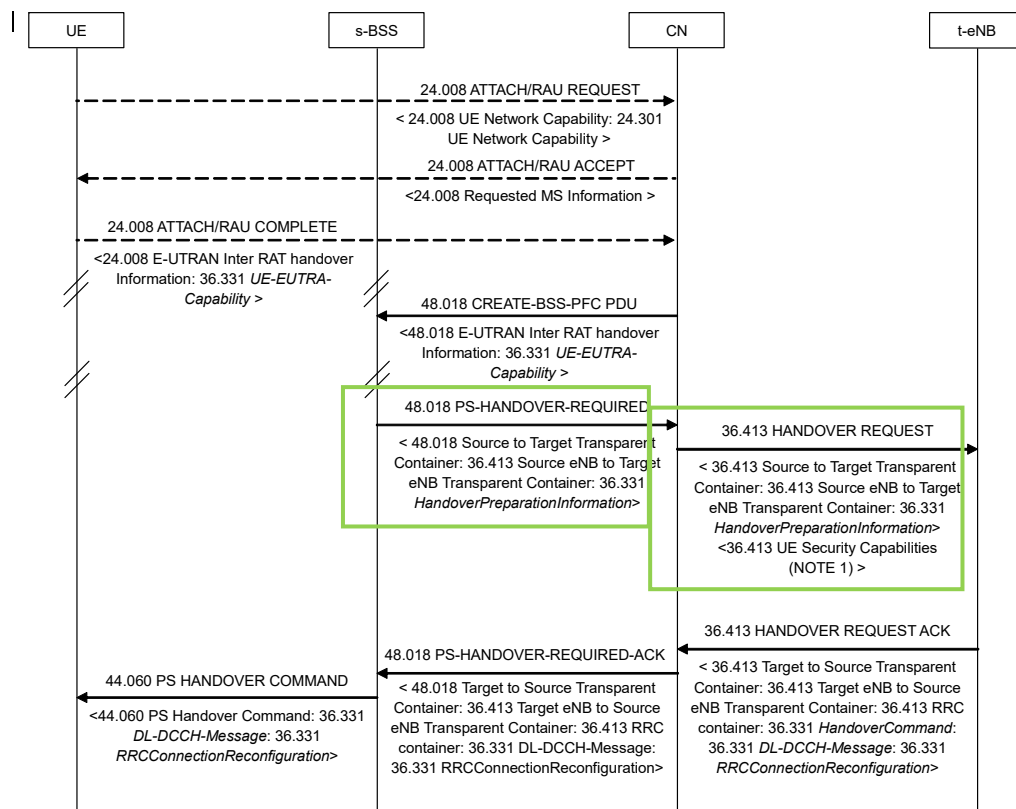
4. Claim 4

a. “The method of claim 2, wherein”

120. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 2 for the reasons stated above.

b. “the HandoverPreparationInformation message is sent from the source eNB to the target eNB to request the handover.”

121. For the reasons expressed below, a POSITA would have understood that the prior art (in this case, 3GPP-36331-Update and TS 36.331 v9.4.0) discloses the present claim limitation.



NOTE 1: The information included in this IE is derived from the information provided in the “UE Network Capability” IE during network attach / RAU

TS 36.300 V9.5.0 states that the HandoverPreparationInformation message is sent from the source eNB to the target (via a “Source to Target Transparent Container”) to request the handover. Ex. 1008, Figure 19.2.2.5.6-1 (annotated). TS 36.331 V9.4.0 also describes that the HandoverPreparationInformation message is sent from the “source eNB/ source RAN to target eNB.” Ex. 1006, 218.

122. Furthermore, TS 36.300 v9.5.0 states:

[t]he source eNB issues a HANDOVER REQUEST message to the target eNB passing necessary information to prepare the HO at the target side (UE X2 signalling context reference at source eNB, UE S1 EPC signalling context reference, target cell ID, K_{eNB*} , RRC context including the C-RNTI of the UE in the source eNB, **AS-configuration**, E-RAB context and physical layer ID of the source cell + MAC for possible RLF recovery).

Ex. 1007, 49 (emphasis added). The handover request corresponds to necessary information regarding the RRC context, which includes, e.g., the AS-configuration IE (“as-Config”) of the HandoverPreparationInformation message. *Id.*; *see also* Section X.A.1.

5. Claim 5

a. “The method of claim 2, wherein:”

123. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 2 for the reasons stated above.

b. “the handover is an inter-eNB handover.”

124. For the reasons expressed below, a POSITA would have understood

that the prior art (in this case, 3GPP-36331-Update) discloses this claim limitation. 3GPP-36331-Update states in § 5.4 that the handover is an inter-eNB handover. In particular, 3GPP-36331-Update describes that the inter-eNB handover is initiated “by sending the *RRConnectionReconfiguration* message” to the UE, as further illustrated in the figure below. Ex. 1008, §§ 5.4.2.2, 5.4.2.3.

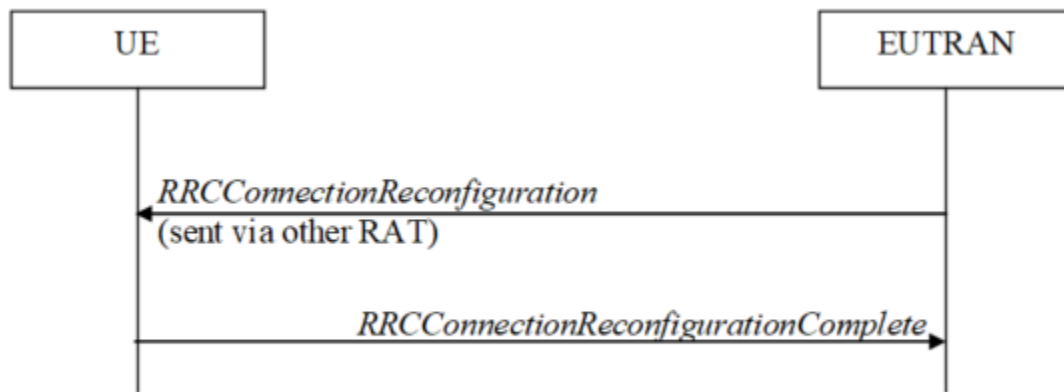


Figure 5.4.2.1-1: Handover to E-UTRA, successful

Id., Fig. 5.4.2.1-1.

6. Claim 6

a. “The method of claim 3, wherein”

125. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 3 for the reasons stated above.

b. “the *HandoverPreparationInformation* message is sent from the source eNB to the target eNB to request the handover.”

126. The present claim element is substantively the same as claim element [4b] and is thus met for the same reasons. Section XII.4.b.

7. Claim 7

a. “The method of claim 3, wherein”

127. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 3 for the reasons stated above.

b. “the handover is an inter-eNB handover.”

128. The present claim element is substantively the same as claim element [5b] and is thus met for the same reasons. Section XII.5.b.

8. Claim 8

a. “The method of claim 1, wherein”

129. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 1 for the reasons stated above.

b. “the HandoverPreparationInformation message is sent from the source eNB to the target eNB to request the handover.”

130. The present claim element is substantively the same as claim element [4b] and is thus met for the same reasons. Section XII.4.b.

9. Claim 9

a. “The method of claim 8, wherein”

131. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 8 for the reasons outlined above.

b. “the handover is an inter-eNB handover.”

132. The present claim element is substantively the same as claim element

[5b] and is thus met for the same reasons. Section XII.5.b.

10. Claim 10

a. “The method of claim 1, wherein”

133. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 1 for the reasons stated above.

b. “the handover is an inter-eNB handover.”

134. The present claim element is substantively the same as claim element [5b] and is thus met for the same reasons. Section XII.5.b.

11. Claim 11

a. “The method of claim 1, wherein”

135. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 1 for the reasons stated above.

b. “a RRCConnectionReconfiguration message is sent from the source eNB to the UE to initiate a handover procedure.”

136. The present claim element is substantively the same as claim element [3b] and is thus met for the same reasons. Section XII.3.b.

12. Claim 12

- a. **“A communication device for use in a wireless communication system, the communication device comprising:**

a control circuit;

a processor installed in the control circuit;

and a memory installed in the control circuit and coupled to the processor;

wherein the processor is configured to execute a program code stored in memory to:”

137. To the extent the preamble is limiting, a POSITA would have understood that the prior art (in this case, 3GPP-36331-Update) discloses the preamble for at least the reasons expressed below. 3GPP-36331-Update discloses a UE (which includes mobile handsets) and eNBs. Ex. 1008, §§ 1, 3.2, 4.2, 5.4. The UE and eNBs each are wireless communication devices having a control circuit, a processor installed in the control circuit, and a memory installed in the control circuit and coupled to the processor. One skilled in the art would understand that the processors of the UE and eNBs are configured to execute program code stored in memory.

- b. **“configuring at least one SCell by a source eNB to a User Equipment (UE); and”**

138. The present claim element is substantively the same as claim element [1b] and is thus met for the same reasons. Section XII.1.b.

- c. **“including information by the source eNB in a HandoverPreparationInformation message for a target eNB to control SCell release in the UE during a handover,”**

139. The present claim element is substantively the same as claim element [1c] and is thus met for the same reasons. Section XII.1.c.

- d. **“wherein the information indicates SCell indexes of all SCells configured to the UE before the handover, thereby allowing the target eNB to include a *sCellToReleaseList* with all the SCells configured to the UE in a handover command for the UE to release the SCells included in the *sCellToReleaseList*.”**

140. The present claim element is substantively the same as claim element [1d] and is thus met for the same reasons. Section XII.1.d.

13. Claim 13

- a. **“The device of claim 12, wherein”**

141. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 12 for the reasons stated above.

- b. **“the handover command corresponds to an RRCConnectionReconfiguration message including mobilityControlInfo.”**

142. The present claim element is substantively the same as claim element [2b] and is thus met for the same reasons. Section XII.2.b.

14. Claim 14

- a. **“The device of claim 13, wherein”**

143. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard,

discloses claim 13 for the reasons stated above.

- b. **“the RRCConnectionReconfiguration message is sent from the source eNB to the UE to initiate a handover procedure.”**

144. The present claim element is substantively the same as claim element [3b] and is thus met for the same reasons. Section XII.3.b.

15. Claim 15

- a. **“The device of claim 13, wherein”**

145. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 13 for the reasons stated above.

- b. **“the HandoverPreparationInformation message is sent from the source eNB to the target eNB to request the handover.”**

146. The present claim element is substantively the same as claim element [4b] and is thus met for the same reasons. Section XII.4.b.

16. Claim 16

- a. **“The device of claim 13, wherein:”**

147. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 13 for the reasons stated above.

- b. **“the handover is an inter-eNB handover.”**

148. The present claim element is substantively the same as claim element [5b] and is thus met for the same reasons. Section XII.5.b.

17. Claim 17

a. “The device of claim 14, wherein”

149. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 14 for the reasons stated above.

b. “the HandoverPreparationInformation message is sent from the source eNB to the target eNB to request the handover.”

150. The present claim element is substantively the same as claim element [4b] and is thus met for the same reasons. Section XII.4.b.

18. Claim 18

a. “The device of claim 14, wherein”

151. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 14 for the reasons stated above.

b. “the handover is an inter-eNB handover.”

152. The present claim element is substantively the same as claim element [5b] and is thus met for the same reasons. Section XII.5.b.

19. Claim 19

a. “The device of claim 12, wherein”

153. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 12 for the reasons stated above.

- b. **“the HandoverPreparationInformation message is sent from the source eNB to the target eNB to request the handover.”**

154. The present claim element is substantively the same as claim element [4b] and is thus met for the same reasons. Section XII.4.b.

20. Claim 20

- a. **“The device of claim 19, wherein”**

155. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 19 for the reasons outlined above.

- b. **“the handover is an inter-eNB handover.”**

156. The present claim element is substantively the same as claim element [5b] and is thus met for the same reasons. Section XII.5.b.

21. Claim 21

- a. **“The device of claim 12, wherein”**

157. Nokia, in view of the knowledge of a POSITA and the 3GPP-Standard, discloses claim 12 for the reasons stated above.

- b. **“the handover is an inter-eNB handover.”**

158. The present claim element is substantively the same as claim element [5b] and is thus met for the same reasons. Section XII.5.b.

22. Claim 22

- a. **“The method of claim 12, wherein”**

159. Nokia in view of the 3GPP-Standard discloses claim 12 for the reasons

stated above.

- b. **“a RRCConnectionReconfiguration message is sent from the source eNB to the UE to initiate a handover procedure.”**

160. The present claim element is substantively the same as claim element [3b] and is thus met for the same reasons. Section XII.3.b.

XIII. GROUND 2: ERICSSON IN VIEW OF THE 3GPP-STANDARD RENDER CLAIMS 1-22 OBVIOUS

161. Ericsson in view of the 3GPP-Standard (i.e., 3GPP-36331-940, 3GPP-36300-950, and 3GPP-36331-Update) anticipates the Challenged Claims for the reasons below.

1. Claim 1

- a. **“A method of Secondary Cell (SCell) release during handover comprising:”**

162. To the extent the preamble is limiting, a POSITA would have understood that the prior art (in this case, 3GPP-36331-Update) discloses the preamble for at least the reasons expressed below. In a first example, the summary of change discloses that the change request includes changes related to secondary cell release. *See, e.g.*, Ex. 1008, 1.

163. In a second example, 3GPP-36331-Update discloses configuration parameters, including an “introduction of top level fields within the reconfiguration message to support addition/ modification and release of secondary cells.” *See, e.g.*, Ex. 1008, 1-2. Samsung further discloses an RRC Connection Reconfiguration

procedure, wherein one purpose of the RRC Connection Reconfiguration procedure is to “add/modify/release SCells.” *See, e.g.*, Ex. 1008, § 5.3.5.1.

164. 3GPP-36331-Update further discloses that “the received *RRCCConnectionReconfiguration* includes the *sCellToReleaseList*,” to “perform SCell release as specified in 5.3.10.3a.” *See, e.g.*, Ex. 1008, §§ 5.3.5.3, 5.4.5.4. 3GPP-36331-Update further outlines a method for SCell release. *See, e.g.*, Ex. 1008, § 5.3.10.3a.

b. “configuring at least one SCell by a source eNB to a User Equipment (UE); and”

165. A POSITA would have understood that the prior art (in this case, 3GPP-36331-Update) discloses the present claim limitation for at least the reasons expressed below. First, 3GPP-36331-Update states that E-UTRAN (that is, the source eNB) “may configure a UE that supports Carrier Aggregation, with one or more SCells in addition to the PCell that is initially configured during connection establishment.” *See, e.g.*, Ex. 1008, § 5.3.1.1.

166. Second, 3GPP-36331-Update states that E-UTRAN (that is, the source eNB) “can independently add, remove or modify SCells by means of the RRC connection reconfiguration procedure using the *RRCCConnectionReconfiguration* message.” *See, e.g.*, Ex. 1008, § 5.3.1.3.

167. Third, 3GPP-36331-Update states that the source eNB configures the UE by means of the RRC protocol. *See, e.g.*, Ex. 1008, § 5.3.1.3, § 5.3.10.3a.

168. Fourth, 3GPP-36331-Update states that the source eNB controls the RRC connection reconfiguration procedure. The purpose of the RRC connection reconfiguration procedure is “to modify an RRC connection, e.g. to establish/ modify/ release RBs, to perform handover, to setup/ modify/ release measurements, to add/ modify/ release SCells.” *See, e.g.*, Ex. 1008, § 5.3.5.1, § 5.4.2.3, § 6.2.2, Fig. 5.3.5.1-1. Therefore, a person having ordinary skill in the art would understand that the E-UTRAN of 3GPP-36331-Update configuring the UE with one or more SCells discloses the present claim limitation.

c. “including information by the source eNB in a HandoverPreparationInformation message for a target eNB to control SCell release in the UE during a handover,”

169. Ericsson in view of the 3GPP-Standard discloses the present claim limitation. TS 36.331 v9.4.0 discloses a “HandoverPreparationInformation message” sent from the “source eNB” to the “target eNB.” *See, e.g.*, Ex. 1006, 216. The “HandoverPreparationInformation message” is “used to transfer the E-UTRA RRC information used by the target eNB during handover preparation, including UE capability information.” *Id.*

170. The “HandoverPreparationInformation message” includes several types of information elements or “IEs,” as described in the standard, and as illustrated below.

***HandoverPreparationInformation* message**

```
-- ASN1START

HandoverPreparationInformation ::= SEQUENCE {
    criticalExtensions      CHOICE {
        c1                  CHOICE {
            handoverPreparationInformation-r8  HandoverPreparationInformation-r8-IEs,
            spare7 NULL,
            spare6 NULL, spare5 NULL, spare4 NULL,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture      SEQUENCE {}
    }
}

HandoverPreparationInformation-r8-IEs ::= SEQUENCE {
    ue-RadioAccessCapabilityInfo  UE-CapabilityRAT-ContainerList,
    as-Config                      AS-Config                      OPTIONAL,      -- Cond HO
    rrm-Config                     RRM-Config                     OPTIONAL,
    as-Context                     AS-Context                     OPTIONAL,      -- Cond HO
    nonCriticalExtension           HandoverPreparationInformation-v920-IEs  OPTIONAL
}

HandoverPreparationInformation-v920-IEs ::= SEQUENCE {
    ue-ConfigRelease-r9           ENUMERATED {
        rel9, spare7, spare6, spare5, spare4, spare3,
        spare2, spare1, ...}      OPTIONAL,      -- Cond HO2
    nonCriticalExtension           SEQUENCE {}          OPTIONAL
}

-- ASN1STOP
```

Id., pgs. 216-217 (annotated). The “HandoverPreparationInformation message” includes the as-Config IE. *Id.*, 216. The as-Config IE “contains information about RRC configuration information in the source cell which can be utilized by target cell to determine the need to change the RRC configuration during the handover preparation phase.” *Id.*, 218.

171. The as-Config IE includes radio resource configuration IEs, including the RadioResourceConfigDedicated IE, as illustrated below.

AS-Config information element

```
-- ASN1START
AS-Config ::= SEQUENCE {
    sourceMeasConfig           MeasConfig,
    sourceRadioResourceConfig RadioResourceConfigDedicated,
    sourceSecurityAlgorithmConfig SecurityAlgorithmConfig,
    sourceUE-Identity          C-RNTI,
    sourceMasterInformationBlock MasterInformationBlock,
    sourceSystemInformationBlockType1 SystemInformationBlockType1(WITH COMPONENTS
    | {..., nonCriticalExtension ABSENT}),
    sourceSystemInformationBlockType2 SystemInformationBlockType2,
    antennaInfoCommon          AntennaInfoCommon,
    sourceDl-CarrierFreq        ARFCN-ValueEUTRA,
    ...,
    [[ sourceSystemInformationBlockType1Ext OCTET STRING (CONTAINING
    | SystemInformationBlockType1-v890-IEs) OPTIONAL,
    | sourceOtherConfig-r9 OtherConfig-r9
    ]]
}
-- ASN1STOP
```

Id., 218 (annotated).

172. Per 3GPP-36331-Update, the RadioResourceConfigDedicated IE “is used to setup/modify/release RBs, to modify the MAC main configuration, to modify the SPS configuration and to modify dedicated physical configuration.” Ex. 1008, § 6.3.2. Thus, a person having ordinary skill in the art would have understood that the prior art (in this case, 3GPP-36331-Update) discloses “including information by the source eNB in a HandoverPreparationInformation message for a target eNB to control SCell release in the UE during a handover.”

173. Moreover, 3GPP-36331-Update includes the RadioResourceConfigDedicatedSCell IE as part of the RadioResourceConfigDedicated IE. As illustrated in the figure below, the RadioResourceConfigDedicatedSCell includes “UE specific configuration extensions applicable for an SCell.” *Id.*

RadioResourceConfigDedicated information element

```
-- ASN1START
RadioResourceConfigDedicated ::= SEQUENCE {
    srb-ToAddModList          SRB-ToAddModList          OPTIONAL,      -- Cond HO-Conn
    drb-ToAddModList          DRB-ToAddModList          OPTIONAL,      -- Cond HO-
toEUTRA
    drb-ToReleaseList         DRB-ToReleaseList         OPTIONAL,      -- Need ON
    mac-MainConfig            CHOICE {
        explicitValue         MAC-MainConfig,|
        defaultValue          NULL
    } OPTIONAL,      -- Cond HO-
toEUTRA2
    sps-Config                SPS-Config                OPTIONAL,      -- Need ON
    physicalConfigDedicated   PhysicalConfigDedicated   OPTIONAL,      -- Need ON
    ...,
    [[ rlf-TimersAndConstants-r9      RLF-TimersAndConstants-r9      OPTIONAL      -- Need ON
    ]]
}

RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {
    -- UE specific configuration extensions applicable for an SCell
}
```

Id. (annotated). The RadioResourceConfigDedicatedSCell IE is a new contribution to the standard (TS 36.331 v9.4.0) proposed in 3GPP-36331-Update. It was subsequently adopted into the next standard (TS 36.331 v10.0.0).

174. As part of the RadioResourceConfigDedicated IE that “is used to setup/modify/release RBs, to modify the MAC main configuration, to modify the SPS configuration and to modify dedicated physical configuration” (Ex. 1008, § 6.3.2), a person having ordinary skill in the art would understand that the RadioResourceConfigDedicatedSCell IE includes information “for a target eNB to control SCell release in the UE during handover” as required by the present claim limitation.

175. Furthermore, Ericsson discloses the present claim limitation. Ericsson teaches that the CrossCarrierSchedulingConfig IE should be referenced in RadioResourceConfigDedicatedSCell. *See* Ericsson, pgs. 2, 6, 9 (Comment by Ericsson). The IE also includes the ServCellIndex field, as illustrated below:

CrossCarrierSchedulingConfig information elements

```
-- ASN1START
CrossCarrierSchedulingConfig-r10 ::= SEQUENCE {
    pdsch-Start-r10      ENUMERATED {s1, s2, s3, s4}      OPTIONAL, -- Need FFS
    schedulingCell-r10   ServCellIndex-r10               OPTIONAL, -- Need FFS
    ...
}
ServCellIndex-r10 ::= INTEGER (0..7) -- Value range FFS
-- ASN1STOP
```

Ericsson, pg. 9 (annotated). Ericsson states that the ServCellIndex field is “[a] short identity used to identify a serving cell i.e. either the PCell or an SCell.” *Id.* Ericsson teaches that the ServCellIndex is made up of integers 0 through 7. *Id.* It further teaches that the PCell is assigned value 0, “while the *SCellIndex* that has previously been assigned applies for SCells.” *Id.*

176. In other words, the *SCellIndex* is incorporated into the ServCellIndex and the SCells are assigned a value of 1 to 7 (as one would expect based on the description of the ServCellIndex and *SCellIndex* provided in 3GPP-36331-Update), Ex. 1008, § 6.3.4.

***SCellIndex* information element**

```
-- ASN1START
SCellIndex-r10 ::= INTEGER (1..7)
-- ASN1STOP
```

Id.

***ServCellIndex* information element**

```
-- ASN1START
ServCellIndex-r10 ::= INTEGER (0..7)
-- ASN1STOP
```

Id. The ServCellIndex (incorporating the *SCellIndex*) is sent from the source eNB to the target eNB during handover preparation as part of the as-Config IE of the HandoverPreparationInformation message. Ex. 1006, 216. The information allows “a target eNB to control SCell release in the UE during a handover” as required by the limitation.

- d. **“wherein the information indicates SCell indexes of all SCells configured to the UE before the handover, thereby allowing the target eNB to include a *sCellToReleaseList* with all the SCells configured to the UE in a handover command for the UE to release the SCells included in the *sCellToReleaseList*.”**

177. As described with respect to limitation [1c] above, the HandoverPreparationInformation message includes the as-Config IE, which includes the RadioResourceConfigDedicated IE. *See* Section XIII.1.c. The information is sent from the source eNB to the target eNB before handover and provides the necessary information for the target eNB to perform the handover procedure, including SCell release. *Id.*

178. Ericsson states that the information in the HandoverPreparationInformation message “indicates SCell indexes of all SCells configured to the UE before the handover.” Furthermore, Ericsson teaches that the CrossCarrierSchedulingConfig IE should be referenced in RadioResourceConfigDedicatedSCell. *See* Ericsson, 2, 6, 9 (Comment by Ericsson). As illustrated below, CrossCarrierSchedulingConfig IE contains the ServCellIndex

field.

CrossCarrierSchedulingConfig information elements

```
-- ASN1START
CrossCarrierSchedulingConfig-r10 ::= SEQUENCE {
    pdsch-Start-r10      ENUMERATED {s1, s2, s3, s4}      OPTIONAL, -- Need FFS
    schedulingCell-r10   ServCellIndex-r10               OPTIONAL, -- Need FFS
    ...
}
ServCellIndex-r10 ::= INTEGER (0..7) -- Value range FFS
-- ASN1STOP
```

Ericsson, pg. 9 (annotated). Ericsson states that the ServCellIndex field is “[a] short identity used to identify a serving cell i.e. either the PCell or an SCell.” *Id.* Ericsson teaches that the ServCellIndex is made up of integers 0 through 7. *Id.* It further teaches that the PCell is assigned value 0, “while the SCellIndex that has previously been assigned applies for SCells.” *Id.*

179. In other words, the SCellIndex is incorporated into the ServCellIndex, and the SCells are assigned a value of 1 to 7 (as one would expect based on the description of the ServCellIndex and SCellIndex provided in 3GPP-36331-Update). Ex. 1008, § 6.3.4.

SCellIndex information element

```
-- ASN1START
SCellIndex-r10 ::= INTEGER (1..7)
-- ASN1STOP
```

Id.

ServCellIndex information element

```
-- ASN1START
ServCellIndex-r10 ::=                INTEGER (0..7)
-- ASN1STOP
```

Id. The ServCellIndex (incorporating the SCellIndex) is sent from the source eNB to the target eNB during handover preparation as part of the as-Config IE of the HandoverPreparationInformation message. Ex. 1006, 216.

180. Furthermore, because the ServCellIndex incorporated the SCellIndex values, it contains the SCell indexes of all SCells configured to the UE. 3GPP-36331-Update states that “[f]or an UE configured with CA [(carrier aggregation)] the term 'serving cells' is used to denote the set of one or more cells comprising of the primary cell and ***all secondary cells***” (emphasis added). Ex. 1008, § 3.1.

181. Thus, the information in the ServCellIndex “indicates SCell indexes of all SCells configured to the UE before the handover” as required by the present claim limitation.

182. The HandoverPreparationInformation message provides the target eNB with the “necessary information to prepare the HO at the target side,” including information from the as-Config IE when it reaches the target eNB from the source eNB, as explained in Section XII.1.c above. Ex. 1007, 49. If it lacked that information, the target eNB could not “generate[] the RRC message to perform the handover, i.e. *RRCCConnectionReconfiguration* message including the

mobilityControlInformation, to be sent by the source eNB towards the UE.” *Id.* Thus, sending the *HandoverPreparationInformation* message with the information (as described above) allows “the target eNB to include a *sCellToReleaseList* with all the SCells configured to the UE in a handover command for the UE to release the SCells included in the *sCellToReleaseList*.”

183. The *RRCCConnectionReconfiguration* message is sent as a *HandoverCommand* message from the target eNB. Ex. 1006, 216. The *HandoverCommand* message “is used to transfer the handover command generated by the target eNB, which is transparently transferred by the source RAN to the UE.” *Id.*

184. The *RRCCConnectionReconfiguration* message contains the *sCellToReleaseList* IE. Ex. 1008, § 6.2.2.

```
RRCCConnectionReconfiguration-v10xy-IEs ::= SEQUENCE {  
    pCellIndex-r10                INTEGER (0),  
    sCellToReleaseList-r10        SCellToReleaseList-r10  
    sCellToAddModList-r10        SCellToAddModList-r10  
    nonCriticalExtension          SEQUENCE {}  
}
```

	OPTIONAL,	-- Need ON
	OPTIONAL,	-- Need ON
	OPTIONAL	-- Need OP

Id. The *sCellToReleaseList* of the *RRCCConnectionReconfiguration* message contains all of the SCells configured to the UE.

```
SCellToReleaseList-r10 ::= SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellIndex-r10
```

Id. Thus, the target eNB includes “a *sCellToReleaseList* with all the SCells configured to the UE in a handover command” as required by the present claim element.

185. 3GPP-36331-Update states that “if the received *RRCConnectionReconfiguration* includes the *sCellToReleaseList*...perform SCell release as specified in 5.3.10.3a.” Ex. 1008, §§ 5.3.5.3, 5.3.5.4.

186. 3GPP-36331-Update further explains performance of SCell release by the UE upon reception of the *sCellToReleaseList*:

5.3.10.3a SCell release

The UE shall:

- 1> if the release is triggered by reception of the *sCellToReleaseList*:
- 2> for each *sCellIndex* value included in the *sCellToReleaseList*:
- 3> if the current UE configuration includes an SCell with value *sCellIndex*:
- 4> release the SCell;

Ex. 1008, § 5.3.10.3a. Thus, one having ordinary skill in the art would understand that 3GPP-36331-Update teaches “the UE to release the SCells included in the *sCellToReleaseList*,” as required by the present claim element.

2. Claim 2

a. “The method of claim 1, wherein”

187. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 1 for the reasons stated above.

b. “the handover command corresponds to an *RRCConnectionReconfiguration* message including *mobilityControlInfo*.”

188. A POSITA would have understood that the prior art (in this case,

3GPP-36331-Update and TS 36.331 v9.4.0) discloses the present claim limitation for at least the reasons expressed below. As described in TS 36.331 v9.4.0, the HandoverCommand is a message “used to transfer the handover command generated by the target eNB, which is transparently transferred by the source RAN to the UE.” Ex. 1006, 216.

189. The HandoverCommand contains the handoverCommandMessage IE, which “[c]ontains the entire DL-DCCH-Message including the *RRCCConnectionReconfiguration* message used to perform handover to E-UTRAN, generated (entirely) by the target eNB.” *Id.*, pg. 107; *see also*, Ex. 1008, § 6.2.2. One having skill in the art would understand that a command containing a second command corresponds to the second command. Thus, the handover command “corresponds to an *RRCCConnectionReconfiguration* message” as required by the present claim limitation.

190. The *RRCCConnectionReconfiguration* message also contains the *mobilityControlInfo* IE. *Id.*, pg. 107.

```
RRCCConnectionReconfiguration-r8-IEs ::= SEQUENCE {  
    measConfig          MeasConfig          OPTIONAL,  -- Need ON  
    mobilityControlInfo MobilityControlInfo  OPTIONAL,  -- Cond HO
```

191. The definition for the *RRCCConnectionReconfiguration* message describes that the *mobilityControlInfo* IE is “mandatorily present” during inter-node handover and intra-node handover. *Id.*, pgs. 107-108; *see also*, Ex. 1008, § 6.2.2.

192. 3GPP-36331-Update also includes procedures for SCell release when

the RRCConnectionReconfiguration message includes the mobilityControlInfo. Ex. 1008, §§ 5.3.5.4, 5.3.10.3a.

3. Claim 3

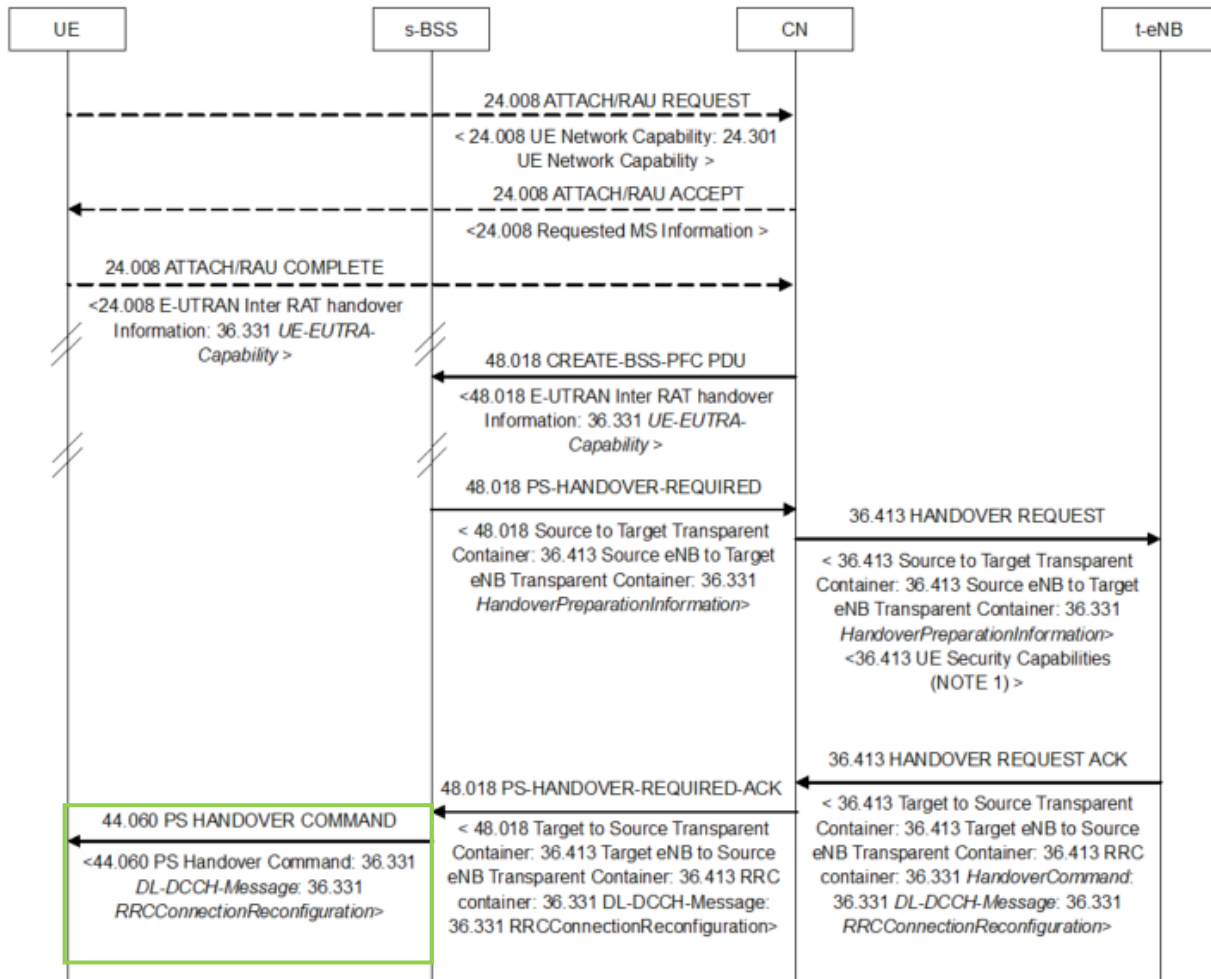
a. “The method of claim 2, wherein”

193. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 2 for the reasons stated above.

b. “the RRCConnectionReconfiguration message is sent from the source eNB to the UE to initiate a handover procedure.”

194. A POSITA would have understood that the prior art (in this case, TS 36.300 v9.5.0 and TS 36.331 v9.4.0) discloses the present claim limitation. As discussed above, the HandoverCommand message includes the RRCConnectionReconfiguration message. *See* Section X.A.2. The HandoverCommand message is “used to transfer the handover command generated by the target eNB, which is transparently transferred by the source RAN to the UE.” Ex. 1006,216. When the RRCConnectionReconfiguration message ends, inter-node handover procedure is initiated. *Id.*, 58.

195. Moreover, TS. 36.300 v9.5.0 discloses that the RRCConnectionReconfiguration message is sent from the source eNB to the UE as a HandoverCommand in order to initiate the handover procedure. Ex. 1007, 118.



Id., Figure 19.2.2.5.6-1 (annotated).

4. Claim 4

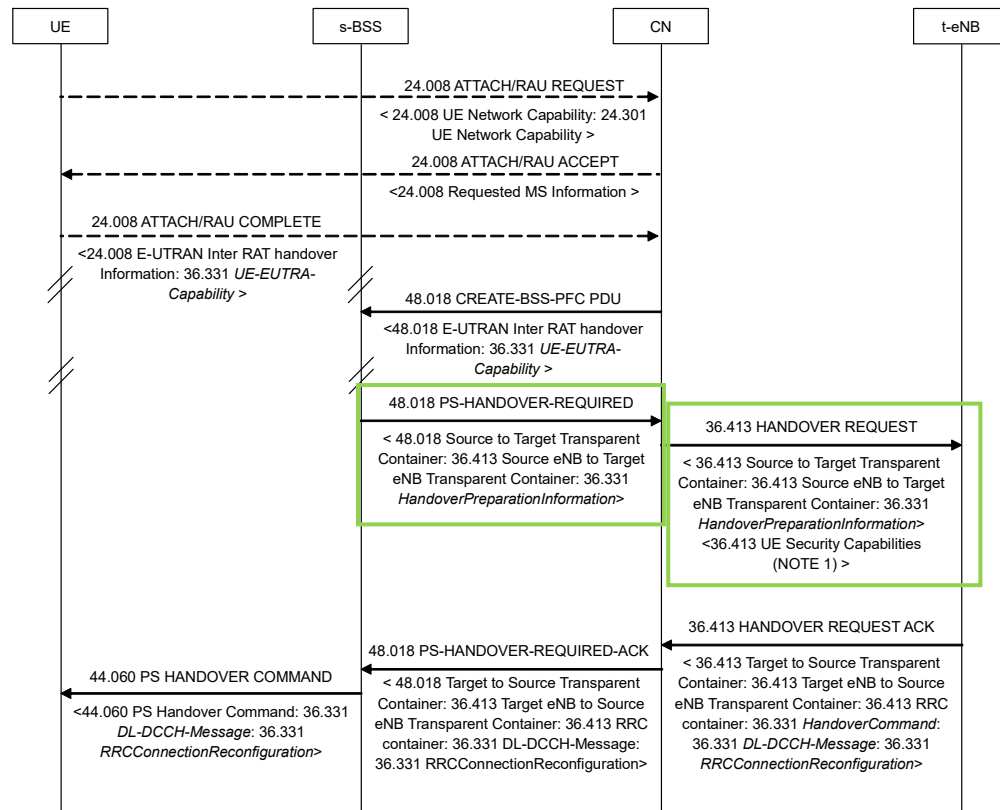
a. “The method of claim 2, wherein”

196. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 2 for the reasons stated above.

b. “the HandoverPreparationInformation message is sent from the source eNB to the target eNB to request the handover.”

197. For the reasons expressed below, a POSITA would have understood

that the prior art (in this case, TS 36.300 v9.5.0 and TS 36.331 v9.4.0) discloses the present claim limitation.



NOTE 1: The information included in this IE is derived from the information provided in the "UE Network Capability" IE during network attach / RAU

In accordance with the figure above, TS 36.300 V9.5.0 describes that the HandoverPreparationInformation message is sent from the source to the target using a "Source to Target Transparent Container" to request the handover. Ex. 1007, Figure 19.2.2.5.6-1 (annotated).

198. Furthermore, TS 36.300 v9.5.0 states that:

[t]he source eNB issues a HANDOVER REQUEST message to the target eNB passing necessary information to prepare the HO at the target side (UE X2 signalling context reference at source eNB, UE S1 EPC signalling context reference, target cell ID, K_{eNB} *, RRC context

including the C-RNTI of the UE in the source eNB, **AS-configuration**, E-RAB context and physical layer ID of the source cell + MAC for possible RLF recovery)

TS 36.300 V9.5.0, pg. 49 (emphasis added). The handover request corresponds to necessary information regarding the RRC context, including, for example, the AS-configuration IE (“as-Config”) of the HandoverPreparationInformation message. *Id.*; see also Section X.A.1.

5. Claim 5

a. “The method of claim 2, wherein:”

199. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 2 for the reasons stated above.

b. “the handover is an inter-eNB handover.”

200. For the reasons expressed below, a POSITA would have understood that the prior art (in this case, 3GPP-36331-Update) discloses the present claim limitation. Ex. 1008, § 5.4 states that the handover is an inter-eNB handover. 3GPP-36331-Update further states that inter-eNB handover is initiated “by sending the RRCConnectionReconfiguration message” to the UE, as further shown in the below figure:

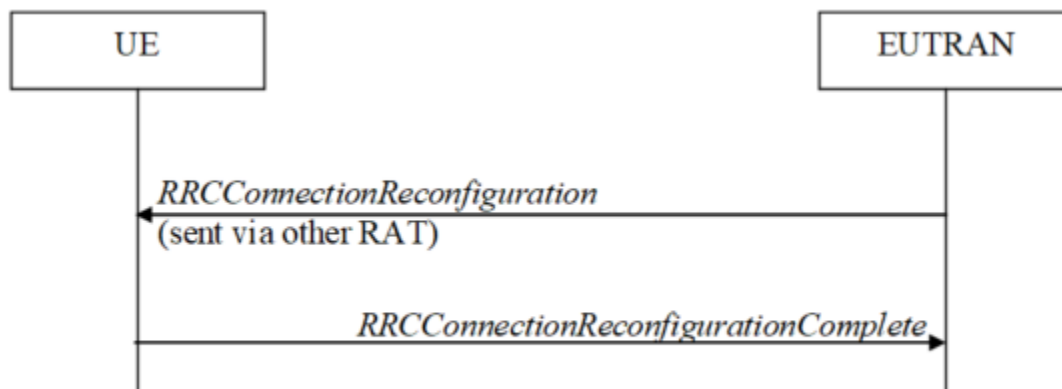


Figure 5.4.2.1-1: Handover to E-UTRA, successful

Ex. 1008, §§ 5.4.2.2, 5.4.2.3., Fig. 5.4.2.1-1.

6. Claim 6

a. “The method of claim 3, wherein”

201. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 3 for the reasons stated above.

b. “the HandoverPreparationInformation message is sent from the source eNB to the target eNB to request the handover.”

202. The present claim element is substantively the same as claim element [4b] and is thus met for the same reasons. Section XII.4.b.

7. Claim 7

a. “The method of claim 3, wherein”

203. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 3 for the reasons stated above.

b. “the handover is an inter-eNB handover.”

204. The present claim element is substantively the same as claim element

[5b] and is thus met for the same reasons. Section XII.5.b.

8. Claim 8

a. “The method of claim 1, wherein”

205. Ericsson in view of the 3GPP-Standard discloses claim 1 for the reasons stated above.

b. “the HandoverPreparationInformation message is sent from the source eNB to the target eNB to request the handover.”

206. The present claim element is substantively the same as claim element [4b] and is thus met for the same reasons. Section XII.4.b.

9. Claim 9

a. “The method of claim 8, wherein”

207. Ericsson in view of the 3GPP-Standard discloses claim 8 for the reasons outlined above.

b. “the handover is an inter-eNB handover.”

208. The present claim element is substantively the same as claim element [5b] and is thus met for the same reasons. Section XII.5.b.

10. Claim 10

a. “The method of claim 1, wherein”

209. Ericsson in view of the 3GPP-Standard discloses claim 1 for the reasons stated above.

b. **“the handover is an inter-eNB handover.”**

210. The present claim element is substantively the same as claim element [5b] and is thus met for the same reasons. Section XII.5.b.

11. Claim 11

a. **“The method of claim 1, wherein”**

211. Ericsson in view of the 3GPP-Standard discloses claim 1 for the reasons stated above.

b. **“a RRCConnectionReconfiguration message is sent from the source eNB to the UE to initiate a handover procedure.”**

212. The present claim element is substantively the same as claim element [3b] and is thus met for the same reasons. Section XII.3.b.

12. Claim 12

a. **“A communication device for use in a wireless communication system, the communication device comprising:**

a control circuit;

a processor installed in the control circuit;

and a memory installed in the control circuit and coupled to the processor;

wherein the processor is configured to execute a program code stored in memory to:”

213. To the extent the preamble is limiting, A POSITA would have understood that the prior art (in this case, 3GPP-36331-Update) discloses the

preamble for at least the reasons expressed below. 3GPP-36331-Update discloses a UE (which includes mobile handsets). 3GPP-36331-Update further discloses eNBs (which are the base stations with which the UE communicates). Ex. 1008, §§ 1, 3.2, 4.2, 5.4. Both the UE and eNBs are wireless communication devices having a control circuit, a processor installed in the control circuit, and a memory installed in the control circuit and coupled to the processor. One skilled in the art would understand that the processors of the UE and eNBs are configured to execute program code stored in memory.

b. “configuring at least one SCell by a source eNB to a User Equipment (UE); and”

214. The present claim element is substantively the same as claim element [1b]; accordingly, it is met for the same reasons. Section XIII.1.b.

c. “including information by the source eNB in a HandoverPreparationInformation message for a target eNB to control SCell release in the UE during a handover, wherein the information indicates SCell indexes of all SCells configured to the UE before the handover,”

215. The present claim element is substantively the same as claim element [1c]; accordingly, it is met for the same reasons. Section XIII.1.c.

d. “thereby allowing the target eNB to include a *sCellToReleaseList* with all the SCells configured to the UE in a handover command for the UE to release the SCells included in the *sCellToReleaseList*.”

216. The present claim element is substantively the same as claim element

[1d]; accordingly, it is met for the same reasons. Section XIII.1.d.

13. Claim 13

a. “The device of claim 12, wherein”

217. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 12 for the reasons stated above.

b. “the handover command corresponds to an RRCConnectionReconfiguration message including mobilityControlInfo.”

218. The present claim element is substantively the same as claim element [2b] and is thus met for the same reasons. Section XII.2.b.

14. Claim 14

a. “The device of claim 13, wherein”

219. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 13 for the reasons stated above.

b. “the RRCConnectionReconfiguration message is sent from the source eNB to the UE to initiate a handover procedure.”

220. The present claim element is substantively the same as claim element [3b] and is thus met for the same reasons. Section XII.3.b.

15. Claim 15

a. “The device of claim 13, wherein”

221. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 13 for the reasons stated above.

- b. **“the HandoverPreparationInformation message is sent from the source eNB to the target eNB to request the handover.”**

222. The present claim element is substantively the same as claim element [4b] and is thus met for the same reasons. Section XII.4.b.

16. Claim 16

- a. **“The device of claim 13, wherein:”**

223. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 13 for the reasons stated above.

- b. **“the handover is an inter-eNB handover.”**

224. The present claim element is substantively the same as claim element [5b] and is thus met for the same reasons. Section XII.5.b.

17. Claim 17

- a. **“The device of claim 14, wherein”**

225. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 14 for the reasons stated above.

- b. **“the HandoverPreparationInformation message is sent from the source eNB to the target eNB to request the handover.”**

226. The present claim element is substantively the same as claim element [4b] and is thus met for the same reasons. Section XII.4.b.

18. Claim 18

a. “The device of claim 14, wherein”

227. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 14 for the reasons stated above.

b. “the handover is an inter-eNB handover.”

228. The present claim element is substantively the same as claim element [5b] and is thus met for the same reasons. Section XII.5.b.

19. Claim 19

a. “The device of claim 12, wherein”

229. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 12 for the reasons stated above.

b. “the HandoverPreparationInformation message is sent from the source eNB to the target eNB to request the handover.”

230. The present claim element is substantively the same as claim element [4b] and is thus met for the same reasons. Section XII.4.b.

20. Claim 20

a. “The device of claim 19, wherein”

231. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 19 for the reasons outlined above.

b. “the handover is an inter-eNB handover.”

232. The present claim element is substantively the same as claim element

[5b] and is thus met for the same reasons. Section XII.5.b.

21. Claim 21

a. “The device of claim 12, wherein”

233. Ericsson in view of the knowledge of a POSITA and the 3GPP-Standard discloses claim 12 for the reasons stated above.

b. “the handover is an inter-eNB handover.”

234. The present claim element is substantively the same as claim element [5b] and is thus met for the same reasons. Section XII.5.b.

22. Claim 22

a. “The method of claim 12, wherein”

235. Ericsson in view of the 3GPP-Standard discloses claim 12 for the reasons stated above.

b. “a RRCConnectionReconfiguration message is sent from the source eNB to the UE to initiate a handover procedure.”

236. The present claim element is substantively the same as claim element [3b] and is thus met for the same reasons. Section XII.3.b.

XIV. MOTIVATION TO COMBINE NOKIA AND ERICSSON WITH THE 3GPP-STANDARD

237. At the time of the '489 Patent, it would have been obvious to one having ordinary skill in the art to combine Nokia or Ericsson with the 3GPP-Standard. Any POSITA would have had knowledge of the latest versions of the 3GPP-Standard, including 3GPP TS 36.331 v9.4.0 (3GPP-36331-940), 3GPP TS.

36.300 v9.5.0 (3GPP-36300-950), and R2-105971(3GPP-36331-Update), which are all cited in the specification of the '489 patent. '489 Patent, 2:21-27. Furthermore, it would have been a simple matter of standard practice for a POSITA to have used knowledge from the Standard, coupled with Nokia or Ericsson, to arrive at the Challenged Claims.

238. During prosecution of the '489 Patent, Patent Owner argued that the amended claims of the '489 Patent are not rendered invalid in light of the prior art references, including an earlier draft of the 3GPP-36331-Update reference (i.e., R2-104991), due to a revision of the claim language from “wherein the information indicates SCell indexes of all SCells configured to the UE” to “wherein the information indicates SCell indexes of all SCells configured to the UE *before the handover*” (emphasis added). *Compare* Ex. 1010, 37, *with* Ex. 1010, 52.

239. Nokia and Ericsson provide for the above-modified claim limitation. In particular, Nokia and Ericsson each provide for the information in a HandoverPreparationInformation message. In each of Nokia and Ericsson, the HandoverPreparationInformation message indicates SCell indexes of all SCells configured to the UE before the handover. The other limitations claimed in the '489 Patent are clearly disclosed in the 3GPP-Standard, as illustrated in the Grounds.

240. Accordingly, combining the Nokia or Ericsson contributions with the 3GPP-Standard (for example, 3GPP-36331-940, 3GPP-36300-950, and 3GPP-

36331-Update) would render all claims of the '489 obvious to a POSITA at the time of the '489 Patent.

241. A POSITA would have been motivated to combine Nokia or Ericsson with the 3GPP-Standard to result in the claimed invention. Nokia and Ericsson directed to the same field of carrier aggregation (the very field addressed by the 3GPP-Standard), and both Nokia and Ericsson are directed to solving problems related to carrier aggregation. Both Nokia and Ericsson specifically discuss SCell configuration. This is a central focus of 3GPP-36331-Update, which represents the draft update to 3GPP-36331-940.

242. Nokia includes a proposal regarding SCell configuration parameters related to carrier aggregation (Nokia,1), and Ericsson also includes a proposal regarding SCell radio configuration parameters (Ericsson,1, 6-7, 9). Ericsson explicitly states that its proposal is provided “for inclusion in draft 36.331” and cites a previous draft of 3GPP-36331-Update as a reference. *Id.*, 7.

243. Furthermore, Nokia and Ericsson are both contributions specifically directed to 3GPP-36331-940 and its draft update, 3GPP-36331-Update. Ericsson, 1, 9; Nokia, 1. Both Nokia and Ericsson are contributions designed, developed, and intended to be incorporated into the 3GPP-Standard.

244. Additionally, any person having ordinary skill in the art would have knowledge of 3GPP-36331-940, 3GPP-36300-950, and 3GPP-36331-Update, which

are cited in the specification of the '489 Patent. '489 Patent, 2:21-27. As such, a POSITA would have been aware that 3GPP-36331-Update provides a procedure for SCell Release upon reception of the RRCConnectionReconfiguration message from the target eNB. Ex. 1008, §§ 5.3.5.4, 5.3.10.3a.

245. 3GPP-36331-Update states that “if the current UE configuration includes an SCell with value SCellIndex: release the SCell.” Ex. 1008, §5.3.10.3a. Samsung further instructs to “release all SCells that are part of the UE configuration.” *Id.* Thus, a POSITA would have been motivated to provide the target eNB with information about which SCells are configured to the UE so that the target SCell could provide to the UE the information about which SCells to release. One having ordinary skill in the art would have known that without this SCell configuration information, performance of the procedure outlined in 3GPP-36331-Update and adopted into the subsequent version of the Standard (i.e., 3GPP 36.331 v10.0.0) would be undermined. Therefore, a POSITA would have pursued the proposed combinations.

246. In addition to being motivated to pursue the proposed combination, a POSITA would have had a reasonable expectation of success in meeting the claim limitations of the '489 Patent. As noted above, the 3GPP-Standard (including TS 36.331 v9.4.0, TS 36.300 v9.5.0, and 3GPP-36331-Update) would have been known to a POSITA, and the Nokia and Ericsson contributions were designed specifically

to be incorporated into the Standard (including in particular, TS 36.331 v9.4.0, and 3GPP-36331-Update).

247. For example, Nokia provides for SCell configuration information to be located in the RadioResourceConfigDedicated IE, which is an IE that was already included as part of the Standard. Nokia,⁶ Similarly, Ericsson provides for SCell configuration information to be located in the CrossCarrierSchedulingConfig IE “as part of the Scell dedicated radio configurations (RadioResourceConfigDedicatedScell),” which is also an IE that was already included in the Standard. Ericsson,^{6, 9} Accordingly, one having skill in the art would have expected a reasonable expectation of success in meeting the claimed invention of the ’489 Patent by combining Nokia or Ericsson with the 3GPP-Standard.

XV. CONCLUSION

248. This Declaration represents the opinions that I have formed up to date based on the material currently available to me. I reserve the right to revise, supplement, and/or amend my opinions stated in this Declaration based on new information that becomes available to me and on my continuing analysis of the materials available to me.

249. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and

that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine, imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: July 25, 2024



Dr. Christopher Hansen