UNITED STATES PATENT AND TRADEMARK OFFICE

_____

BEFORE THE PATENT TRIAL AND APPEAL BOARD

_____

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

HUAWEI TECHNOLOGIES CO., LTD.,
Patent Owner.

_____

Case No. IPR2017-01483
U.S. Patent No. 8,483,166 B2

_____

PATENT OWNER'S NOTICE OF APPEAL

Pursuant to 35 U.S.C. §§ 141, 142, and 319, and in accordance with 37

C.F.R. §§ 90.2(a) and 90.3, Patent Owner Huawei Technologies Co., Ltd., ("Patent

Owner") appeals to the United States Court of Appeals for the Federal Circuit from

the final written decision of the Patent Trial and Appeal Board ("Board") in this

case entered on December 4, 2018 (Paper No. 49), and from all underlying orders,

decisions, rulings and opinions regarding the *inter partes* review of U.S. Patent No.

8,483,166 ("'166 patent"). A copy of the final written decision is attached.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner indicates that

the issues on appeal may include, but are not limited to: the Board's

determination(s) of unpatentability of claims 1-5 of the '166 patent under 35

U.S.C. § 103, the construction(s) of those claims, the process by which the Board

reached its determination(s), and any finding or determination supporting or related

to these issues, as well as all other issues decided adversely to Patent Owner in any

orders, decisions, rulings and opinions.

Patent Owner is filing a copy of this Notice of Appeal with (i) the Director

of the U.S. Patent and Trademark Office, (ii) electronically with the Board, and

(iii) the Clerk's Office for the U.S. Court of Appeals for the Federal Circuit, along

with the required docketing fee.

Dated: January 31, 2019   Respectfully Submitted,

                                        /Jeffrey P. Kushan/
                                        Jeffrey P. Kushan

Reg. No. 43,401
SIDLEY AUSTIN LLP
1501 K Street NW
Washington, DC 20005
jkushan@sidley.com
(202) 736-8914
Attorney for Patent Owner Huawei
Technologies Co., Ltd.

CERTIFICATE OF FILING

I certify that the foregoing was filed electronically with the Board through the PTAB E2E System, and a paper copy was served by hand-delivery on January 31, 2019, with the Director of the United States Patent and Trademark Office, at the following address:

> Director of the U.S. Patent and Trademark Office
> c/o Office of the General Counsel
> United States Patent and Trademark Office
> P.O. Box 1450
> Alexandria, Virginia 22313-1450

I further certify that a true and correct copy of the foregoing Notice of Appeal, along with the required filing fee, was filed electronically with the Court of Appeals for the Federal Circuit via CM/ECF on January 31, 2019. Per Fed. Cir. Rule 15(a)(1), one copy of this Notice of Appeal will be hand-delivered to the Clerk's office of the United States Court of Appeals for the Federal Circuit on January 31, 2019, at the following address:

> Clerk of Court
> United States Court of Appeals for the Federal Circuit
> 717 Madison Place NW
> Washington, DC 20439

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), I hereby certify that on January 31, 2019, I caused to be served a true and correct copy of the foregoing by electronic mail on the following counsel:

Kevin P.B. Johnson
kevinjohnson@quinnemanuel.com
Quinn Emanuel Urquhart & Sullivan
555 Twin Dolphin Drive, 5th Floor
Redwood City, CA 94065

Brian Mack
brianmack@quinnemanuel.com
Quinn Emanuel Urquhart & Sullivan
50 California Street, 22nd Floor
San Francisco, CA 94111

Marissa Ducca
marissaducca@quinnemanuel.com
Deepa Acharya
deepaacharya@quinnemanuel.com
Jared Newton
jarednewton@quinnemaneul.com
Quinn Emanuel Urquhart & Sullivan
777 6th Street NW, 11th Floor
Washington, DC 20001

Dated: January 31, 2019

Respectfully Submitted,

/Jeffrey P. Kushan/
Jeffrey P. Kushan
Reg. No. 43,401
SIDLEY AUSTIN LLP
1501 K Street NW
Washington, DC 20005
jkushan@sidley.com
(202) 736-8914
Attorney for Patent Owner Huawei Technologies Co., Ltd.

UNITED STATES PATENT AND TRADEMARK OFFICE
————————

BEFORE THE PATENT TRIAL AND APPEAL BOARD
————————

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

HUAWEI TECHNOLOGIES CO., LTD.
Patent Owner.

————————

Case IPR2017-01483
Patent 8,483,166 B2

————————

Before TREVOR M. JEFFERSON, MICHELLE N. WORMMEESTER, and
JOHN F. HORVATH, *Administrative Patent Judges*.

HORVATH, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

A. *Background*

Samsung Electronics Co., Ltd.[1] ("Petitioner") filed a Petition (Paper 2, "Pet.") to institute *inter partes* review of claims 1–5 and 12–16 ("the challenged claims") of U.S. Patent No. 8,843,166 B2 (Ex. 1001, "the '166 patent"). Huawei Technologies Co., Ltd. ("Patent Owner") filed a Preliminary Response (Paper 10, "Prelim. Resp."). Upon consideration of the Petition and Preliminary Response, we instituted review of claims 1–5 of the '166 patent, but declined to institute review of claims 12–16. Paper 17, 35 ("Dec. Inst.").

Patent Owner filed a Response to the Petition, addressing only instituted claims 1–5. Paper 26 ("PO Resp."). Subsequent to Patent Owner's Response, the Supreme Court issued its decision in *SAS Institute, Inc. v. Iancu*, 138 S.Ct. 1348 (2018), holding that *inter partes* reviews may not be instituted on fewer than all claims challenged in a petition. We, therefore, modified our Institution Decision to include review of previously non-instituted claims 12–16. Paper 27, 3. Patent Owner filed a Supplemental Response limited to addressing these additional claims. Paper 32 ("PO Supp. Resp."). Petitioner filed a Reply to the Response and Supplemental Response. Paper 34 ("Reply"). Patent Owner filed a Sur-Reply to Petitioner's Reply. Paper 42 ("PO Sur-Reply"). We held an oral hearing on September 25, 2018, and the hearing transcript is included in the record. *See* Paper 48 ("Tr.").

---

[1] Samsung identifies Samsung Electronics America, Inc. and Samsung Research America as real parties-in-interest. Pet. 3.

We have jurisdiction under 35 U.S.C. § 6(b). This is a Final Written
Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons
set forth below, we find Petitioner has shown by a preponderance of the
evidence that claims 1–5 of the '166 patent are unpatentable, but has failed
to show by a preponderance of the evidence that claims 12–16 are
unpatentable.

B. Related Matters

Petitioner identifies the following as matters that could affect, or be
affected by, a decision in this proceeding: *Huawei Techs. Co., Ltd. v.
Samsung Elec. Co., Ltd.*, Case No. 3:16-cv-02787 (N.D. Cal.). Pet. 3.
Patent Owner identifies the same matter, as well as U.S. Patent No.
9,084,159 and pending U.S. Patent App. No. 14/752,426, which are the child
and grandchild, respectively, of the'166 patent. Paper 5, 1.

C. Evidence Relied Upon[2]

Reference	Date	Exhibit
Intra-domain connection of Radio Access Network (RAN) nodes to multiple Core Network (CN) nodes (Release 7), 3rd Generation Partnership Project, 3GPP TS 23.236 V7.0.0 (2006–12) ("TS 23.236").	Dec. 8, 2006	1004
3GPP System Architecture Evolution: Report on Technical Options and Conclusions (Release 7), 3rd Generation Partnership Project, 3GPP TR 23.882 V1.12.0 (2007-10) ("TR 23.882")	Oct. 25, 2007	1005

---

[2] Petitioner also relies upon the Declarations of Raziq Yaqub, Ph.D.
(Ex. 1012), and Tim Arthur Williams, Ph.D. (Ex. 1014). Patent Owner
relies on the Declaration of Dr. Mark Mahon (Ex. 2002).

Reference		Date	Exhibit
Discussion on the structure of S-TMSI, China Mobile and Huawei, 3GPP TSG SA WG2 Meeting #59, ("S2-073255").		Aug. 22, 2007	1006
Shaheen	US 2007/0248064 A1	Oct. 25, 2007	1007

D. Instituted Grounds of Unpatentability

References	Basis	Claim(s) Challenged
TS 23.236 and S2-073255	§ 103(a)	1–3, 5, 12–14, and 16
TS 23.236, S2-073255, and TR 23.882	§ 103(a)	4 and 15
TS 23.236, S2-073255, and Shaheen	§ 103(a)	12–14 and 16
TS 23.236, S2-073255, TR 23.882 and Shaheen	§ 103(a)	15

II. ANALYSIS

A. The '166 Patent

The '166 patent is directed toward a method and apparatus for allowing user equipment (UE) to access a legacy network, such as a 2G/3G network, via a temporary ID obtained from an evolved or LTE network. Ex. 1001, 1:19–23, Abstract.

According to the '166 patent, when a UE initially joins a 2G/3G network, it is attached to a Serving GPRS Support Node (SGSN), which assigns a Packet Temporary Mobile Station Identity (P-TMSI) to the UE. *Id*. at 2:18–21. The P-TMSI is a 32-bit word that includes a 10-bit Network Resource Identify (NRI) used to identify the assigning SGSN. *Id*. at 5:30–43. When the UE moves from one Radio Access Node (RAN) in the network to another, the UE sends a Radio Resource Control (RRC) message

to the new RAN. *Id*. at 5:47–49. The RRC message includes P-TMSI and Non Access Stratum (NAS) fields, and the NAS field includes a Radio Access Update (RAU) message that includes P-TMSI and Radio Access Identifier (RAI) fields. *Id*. at 5:49–52. The new RAN parses the P-TMSI from the RRC message, and if it can locate the SGSN from the NRI field of the P-TMSI, forwards the NAS field to the SGSN. *Id*. at 5:53–58. If the RAN cannot locate the SGSN, it selects a new SGSN, and sends the NAS field to the new SGSN. *Id*. at 5:58–60. The new SGSN parses the NAS field to obtain the P-TMSI, NRI, and RAI, and uses them to send a Context Request message to the old SGSN. *Id*. at 5:60–66. The new SGSN receives a UE context from the old SGSN, and assigns new RAI and P-TMSI identifiers to the UE. *Id*. at 5:67–6:4.

Similar to the procedure discussed above for 2G/3G networks, when a UE joins an LTE network, it is attached to a mobility management entity (MME) that assigns an SAE-TMSI to the UE. Ex. 1001, 7:31–36. The SAE-TMSI may be longer than the 32 bit P-TMSI. *Id*. at 3:21–26. For example, the SAE-TMSI may be 40 or 56 bits long. *Id*. at 9:21–25. When the UE moves from an LTE network to a legacy 2G/3G network, the UE cannot simply replace the P-TMSI field of the RRC message with the longer SAE-TMSI of the LTE network. Accordingly, the UE adds "MME information for uniquely identifying an MME . . . to an access message sent to the old network." *Id*. at 13:23–26. This allows the old or 2G/3G network to "determine and find the MME that is accessed by the UE in the evolved [LTE] network." *Id*. at 13:23–28.

According to the '166 patent, different LTE or SAE networks have different configurations, and the MME information needed to identify an

MME depends on the network configuration. Ex. 1001, 7:43–45. For each
configuration, however, the MME information uniquely identifies the MME
in the network. *Id*. at 4:15–19, 6:9–16, 7:37–42, 13:23–26, 13:41–45,
15:60–62. For example, if an MME-id can uniquely identify the MME, the
MME information is the MME-id. *Id*. at 6:29–35, 7:46–51. In this case,
when the UE moves from the LTE network to a 2G/3G network, the MME-
id is added to the P-TMSI and/or RAI fields of the 2G/3G RRC access
message. *Id*. If an MME-id and pool-id can uniquely identify the MME, the
MME information is the MME-id and pool-id. *Id*. at 6:35–38, 8:55–9:3. In
this case, when the UE moves from the LTE network to a 2G/3G network,
the MME-id and pool-id are added to the P-TMSI and/or RAI fields of the
2G/3G RRC access message. *Id*. For example, the MME-id can be added to
the NRI field of the P-TMSI, and the pool-id can be added to other fields of
the P-TMSI or to certain fields of the RAI. *Id*. at 9:3–9. If an MME-id,
pool-id, and PLMN-id (Public Land Mobil Network-id) uniquely identifies
the MME, the MME information is the MME-id, pool-id, and PLMN-id. *Id*.
at 6:38–40, 10:7–26. In this case, when the UE moves from the LTE
network to a 2G/3G network, the MME-id, pool-id, and PLMN-id are added
to the P-TMSI and/or RAI fields of the 2G/3G RRC access message. *Id*.
For example, the MME-id can be added to the NRI field of the P-TMSI, and
the pool-id and PLMN-id can be added to other fields of the P-TMSI and/or
to the RAI. *Id*. at 10:14–17. The RAI and P-TMSI can separately carry or
together carry the pool-id and PLMN-id. *Id*. at 10:23–26.

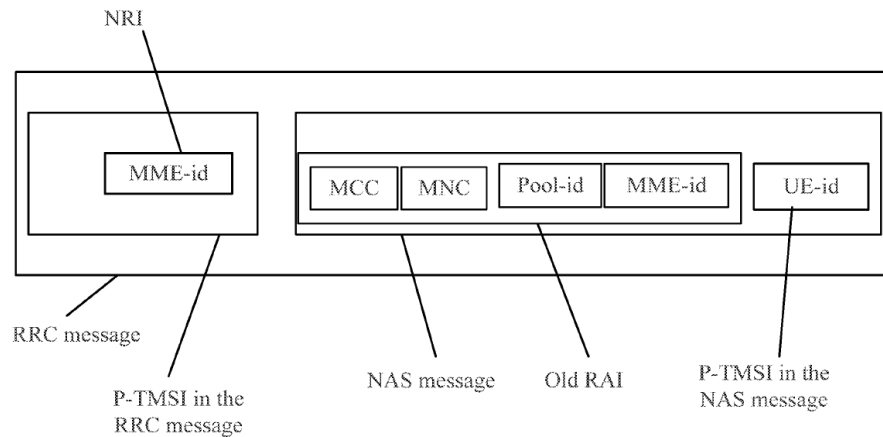Figure 9 of the '166 patent is reproduced below.

FIG. 9

Figure 9 is a schematic illustration of an RRC message that is sent by a UE to a RAN of a 2G/3G network the UE wishes to access using the S-TMSI assigned to the UE by an MME in an LTE network. Ex. 1001, 4:43–44, 11:39–41. As shown in Figure 9, the UE replaces the NRI portion of the P-TMSI field of the RRC message with the MME-id portion of the S-TMSI, replaces the P-TMSI field of the NAS message with the UE-id portion of the S-TMSI, and replaces portions of the RAI field of the NAS message with the pool-id and MME-id portions of the S-TMSI. *Id*. at 11:41–47.

Of the challenged claims, claims 1 and 12 of the '166 patent are independent. Other challenged claims depend directly or indirectly from claims 1 and 12. Claim 1 is representative of the challenged claims, and is reproduced below.

> 1. A method for accessing a 2G/3G network comprising:
>
> obtaining, by a User Equipment (UE), a temporary identity (ID) allocated by a Mobility Management Entity (MME) in an evolved network, wherein the

7

temporary ID comprises MME information for identifying the MME;

adding, by the UE, the MME information from the temporary ID to a first P-Temporary Mobile Station Identity (P-TMSI) in an access message;

sending, by the UE, the access message to a Radio Access Network (RAN) node in the 2G/3G network.

Ex. 1001, 17:46–56. Claim 12 is similar in scope to claim 1, but recites user equipment comprising a receiver, a transmitter, and an MME information adding module for performing the method recited in claim 1. *Compare id.* at 18:48–62, *with id.* at 17:46–56.

B. Claim Construction

The claim construction standard applicable to this *inter partes* review proceeding is the broadest reasonable interpretation in light of the specification. *See* 37 C.F.R. § 42.100(b) (2016); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Consistent with the rule of broadest reasonable interpretation, claim terms generally are given their plain and ordinary meaning, as would be understood by one of ordinary skill in the art in the context of the entire patent disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Only those terms which are in controversy need be construed and only to the extent necessary to resolve the controversy. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999). Except as indicated below, neither Petitioner nor Patent Owner requests or provides express construction for any term in the challenged claims. Pet. 25–27; PO Resp. 12–18.

1. *Mobility Management Entity (MME) Information Adding Module*

Petitioner contends this term, explicitly recited in claims 12, 13, and 16, should be construed as a means-plus-function limitation pursuant to 35 U.S.C. § 112, ¶ 6. Pet. 26. Relying on the declaration testimony of Dr. Williams, Petitioner argues the term does not have an understood meaning in the art, and that the limitations of claims 12, 13, and 16 in which the term appears do not recite sufficient structure for performing the recited functions of the "MME information adding module." *Id*. (citing Ex. 1014 ¶¶ 74–77). Those functions are: adding MME information from the temporary ID to a first P-TMSI in an access message (claim 12), setting the NRI field of the first P-TMSI in the access message to the MME-ID (claim 13), and adding MME information from the temporary ID to an NAS message carried in the access message (claim 16). *Id*.

Petitioner argues the only structure for the MME information adding module described in the '166 patent is the generic block diagram shown in Figure 11. Pet. 26–27 (citing Ex. 1001, 13:35–63). Petitioner further argues that block diagram simply consists of a group of generic submodules, all of which are described in terms of the functions they perform (e.g., NRI setting module) rather than in terms of specific hardware or software for performing those functions. *Id*. Therefore, Petitioner argues, claims 12, 13, and 16 are indefinite under 35 U.S.C. § 112, ¶ 2 because the '166 patent fails to describe any structure corresponding to the recited functions performed by the MME information adding module. *Id*. Hedging its position, however, Petitioner identifies the corresponding structure as "software configured to perform the recited functions." *Id*.

In our Institution Decision, we agreed with Dr. Williams' unrebutted testimony that the term "MME information adding module" does not have an understood meaning in the art. Dec. Inst. 9. We also agreed that the claim limitation reciting the "MME information adding module" did not recite sufficient structure for performing the functions of that module. *Id.* Therefore, we found the "MME information adding module" limitation recited in claims 12–16 require construction pursuant to 35 U.S.C. § 112 ¶ 6. *Id.* at 9–10 (citing *Williamson v. Citrix Online, LLC*, 792 F3d 1339, 1349–50 (Fed. Cir. 2015). Our rules require the Petitioner to construe means-plus-function limitations by "identify[ing] the specific portions of the specification that describe the structure, material, or acts, corresponding to each claimed function." 37 C.F.R. § 42.104(b)(3).

As discussed above, Petitioner alleges the '166 patent fails to describe any structure corresponding to the recited functions performed by the MME information adding module. *See* Pet. 26–27. However, in an *inter partes* review, a petitioner may challenge the patentability of claims "only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications." 35 U.S.C. § 311(b). Therefore, Petitioner alternatively alleges the corresponding structure is "software configured to perform the recited functions." Pet. 27. However, as we found in our Institution Decision, Petitioner "fails to identify where the '166 patent discloses and clearly links software to any of the functions performed by the MME information adding module." Dec. Inst. 10. Thus, Petitioner fails to construe this claim term. *See B. Braun Medical, Inc. v. Abbot Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997) (finding a structure disclosed in the specification corresponds to a means-plus-function

limitation only "if the specification or prosecution history clearly links or associates that structure to the function recited in the claim."). For this reason, we initially declined to institute review of claims 12–16. Dec. Inst. 11, 34–35. However, in view of the *SAS* decision, we modified our Institution Decision to institute review of these claims. *See* Paper 27, 3.

In its Supplemental Response, Patent Owner argues "the Petition did not identify any structure in the specification of the '166 patent associated with the [MME information adding module] term, let alone the specific portions of the specification that describe a structure corresponding to each claimed function." PO Supp. Resp. 10. As a result, Patent Owner argues, "Petitioner failed to meet the minimum requirements for challenging the patentability of an alleged means-plus-function claim," and has "left Patent Owner and the Board without any meaningful way to assess Petitioner's challenge to claim 12 and claims 13–16 that depend from it." *Id*. at 11 (citing 37 C.F.R. § 42.104(b)(3)). Patent Owner further argues a properly filed Petition requires Petitioner to "provide[] such other information as the Director may require by regulation," including the corresponding structure of any challenged means-plus-function claims as required by 37 C.F.R. § 42.104(b)(3). *Id.* at 12 (quoting 35 U.S.C. § 312(a)(4)). Therefore, Patent Owner argues "it would be unfair, improper and untenable" for the Board to analyze this means-plus-function limitation based on evidence that was not set forth in the Petition, and nothing in "the Supreme Court's *SAS Institute* decision allows the Board to reach beyond the Petition" in determining the patentability of claims 12–16. *Id.*

In its Reply, Petitioner maintains "its position that the patent specification lacks sufficient corresponding structure and therefore claims

12–16 are indefinite." Reply 6. Petitioner also "requests that the Board evaluate *Patent Owner's* identification of corresponding structure as set forth in the Supplemental Patent Owner Response," and sets forth reasons why Patent Owner's identified structure is not corresponding structure for the claimed "MME information adding module." *Id.* at 6, 9–10. Petitioner further requests we consider the patentability of claims 12–16 based on an analysis of the allegedly corresponding structure Patent Owner identified in its Supplemental Response. *Id.* at 7–8.

In its Sur Reply, Patent Owner counters that we should reject the patentability analysis of claims 12–16 in Petitioner's Reply. PO Sur Reply 5–7. First, Patent Owner argues that in its Supplemental Response it "did not take any position regarding how the [MME information adding module] term should be construed *in this proceeding*," but merely "explained that Petitioner had notice of Patent Owner's position in the co-pending district court litigation concerning the proper construction of this term . . . before filing its Petition." *Id.* at 5–6. Next, Patent Owner argues that although we were required to institute review of claims 12–16 per the *SAS* decision, Petitioner fails to cite any law that "lowered the 'threshold' requirements of a petition and would thereby forgive Petitioner's failure to comply with 37 C.F.R. § 42.104" in its Petition. *Id.* at 7.

We note that in all of the post-Institution Decision briefing submitted by the parties, as summarized above, neither party has argued that we erred in determining the "MME information adding module" limitation is a means-plus-function limitation to be construed pursuant to 35 U.S.C. § 112 ¶ 6. Accordingly, we maintain that finding here. Additionally, neither party has argued that we erred in determining that Petitioner has failed to identify

in its Petition any corresponding structure in the '166 patent for the claimed "MME information adding module." We maintain that finding here, as well, and discuss its consequences in § II.I, *infra*.

2. *MME Information for Identifying the MME*

This term appears in independent claims 1 and 12, and is required by all of the challenged claims. Ex. 1001, 17:50–51, 18:53–54. The '166 patent, in various places, discloses MME information is "information [that] can uniquely identify the MME accessed by the UE in the evolved network." Ex. 1001, 6:15–16 (emphasis added); *see also id*. at 4:15–19, 7:37–42, 13:23–26, 13:41–45, 15:60–62. The '166 patent similarly discloses that what constitutes MME information depends on the LTE network configuration. *Id*. at 7:43–45. Thus, the MME information can consist of an MME-id, an MME-id + pool-id, or an MME-id + pool-id + PLMN-id depending on the LTE network. *Id*. at 7:46–49, 8:55–60, 10:7–13.

Although the '166 patent describes MME information as all of the information needed to uniquely identify an MME in an LTE network, the term is not used in such a restrictive manner in independent claims 1 and 12 when these claims are construed as a whole. For example, claim 1 requires a UE to obtain a temporary identity from an MME in an evolved (LTE) network, wherein the temporary identity includes MME information for identifying the MME. Ex. 1001, 17:47–51. However, nothing in claim 1 limits the configuration of the evolved network, and the '166 patent discloses that different MME information is required to identify an MME in differently configured networks. Thus, in some networks, the MME information consists of an MME-id, a pool-id, and a PLMN-id. *See id*. at 6:29–31, 6:38–40, 10:7–13.

Claim 1 also requires the UE to add the MME information to a P-TMSI in an access message. *Id*. at 17:52–54. The '166 patent discloses adding different types of MME information to the P-TMSI field of an access message, but doesn't require adding *all* of the MME information to the P-TMSI. For example, the '166 patent discloses the MME-id can be added to the NRI portion of the P-TMSI, and the pool-id and PLMN-id can be added to other portions of the P-TMSI, or to the P-TMSI signature and RAI fields of the access message. *Id*. at 10:23–26. Significantly, the '166 patent also discloses "[t]he RAI, P-TMSI Signature, and P-TMSI can separately carry or together carry the PLMN-id and the Pool-id." *Id*. Thus, the P-TMSI can separately carry MME information, or can carry MME information together with the RAI and P-TMSI signature. That is, the '166 patent discloses MME information can be divided up among different fields of the RRC access message.

In light of these disclosures, and construing claims 1 and 12 as a whole, we construed "MME information for identifying the MME" in our Institution Decision to mean "any information that can be used to identify the MME in an evolved network." Dec. Inst. 13; s*ee* also *General Foods Corp. v. Studiengesellschaft Kohle mbH*, 972 F.2d 1272, 1275 (Fed. Cir. 1992). ("[E]ach claim is an *entity* which must be considered *as a whole*.") (emphases in original); *see also In re Chatfield*, 545 F.2d 152, 158 (CCPA 1976) ("The requirement is that the invention set forth in a claim be construed as a whole").

Although not expressly disagreeing with this construction, Patent Owner argues that MME information must contain "a minimum quantum of information that is capable of identifying the MME in an evolved network,"

and "that minimum quantum of information is the complete MME-id, not a portion or fragment of it." PO Resp. 13. Thus, Patent Owner contends MME information "must include at least the entire MME-id." *Id.* at 18.

Petitioner contends "the Board should maintain the construction set forth in its Decision on Institution." Reply 5. Petitioner argues the '166 patent supports the construction in the Institution Decision because it discloses placing the MME-id outside of the P-TMSI. *Id.* at 4–5 (citing Ex. 1001, 11:49–51). Petitioner also argues claim 2 supports the construction because it recites "the MME information comprises an MME-Identity (MME-id)," and if the "MME information recited in claim 1 must include 'at least the entire MME-id' as Patent Owner contends, then the language of claim 2 would be superfluous." *Id.* at 4 (citing Ex. 1001, 17:57–64). Finally, Petitioner argues that Patent Owner is attempting to read limitations into the claims without "identify[ing] any lexicography or disavowal that would support redefining 'MME information for identifying the MME' as information that includes 'at least the MME-id.'" *Id.* at 5 (citing *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1366 (Fed. Cir. 2012)).

Upon consideration of the arguments and evidence presented by Patent Owner and Petitioner, we maintain our construction of "MME information for identifying the MME" to mean "any information that can be used to identify the MME in an evolved network."

Patent Owner does not dispute that information other than the MME-id is needed to identify an MME in certain types of LTE networks, such as those having MME pools. *See* PO Resp. 15; *see also id.* at 13 (agreeing that the '166 patent discloses LTE networks having configurations that "implicate a need for additional information" to identify an MME, i.e.,

information in addition to the MME-id). Nor does Patent Owner contend that the claims are limited to only certain types of LTE networks that *can* identify an MME using only the MME-id, such as networks that do not have MME pools. Tr. 32:20–33:5. Nor does Patent Owner dispute our finding "that the '166 patent 'doesn't require *all* of the MME information to be added to the P-TMSI field.'" PO Resp. 15 (quoting Dec. Inst. 13).

Given Patent Owner's admissions and contentions, we see no reason to limit "MME information for identifying an MME" to information that includes at least an MME-id. A pool-id, like an MME-id, is information for identifying an MME. This is shown, for example, in Figure 6 of the '166 patent, which is reproduced below.
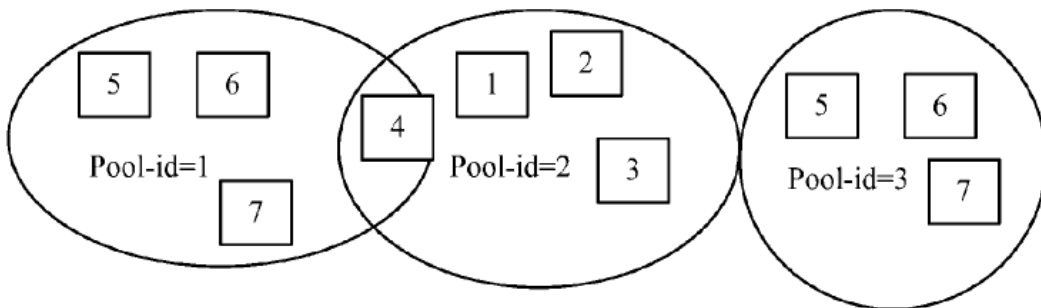

FIG. 6

Figure 6 is a schematic illustration of "combined MME/SGSNs in an embodiment of the invention." Ex. 1001, 8:1–3. Blocks 1–7 represent MMEs having respective MME-ids 1–7. *Id.* at 8:3–4. The MME information needed to identify the leftmost MME in Figure 6 is its MME-id (MME-5) and its pool-id (pool-1). The MME-id alone is insufficient to identify the leftmost MME because there is another MME-5 shown in Figure 6, i.e., MME-5 in pool-3. Thus, like the MME-id, the pool-id is information

used to identify the MME, i.e., it is "MME information for identifying the MME."

Admittedly, in the network illustrated in Figure 6, the pool-id cannot uniquely identify an MME. However, neither can the MME-id. Moreover, Patent Owner agrees that the claims are not limited to certain types of LTE networks (i.e., those lacking MME pools) that *can* uniquely identify an MME using only the MME-id. Tr. 32:20–33:5. Patent Owner also agrees that the '166 patent does not require all of the MME information to be added to the P-TMSI. *See* PO Resp. 15 ("The Board also correctly observed that the '166 patent 'doesn't require all of the MME information to be added to the P-TMSI field.'") (quoting Dec. Inst. 13) (emphasis omitted). Thus, MME information is *any* information used to identify the MME, such as the pool-id *or* the MME-id. It does not need to be all of the information needed to identify the MME, and it does not need to include the MME-id.

Moreover, claim 2 specifically requires the MME information added to the P-TMSI in claim 1 to be an MME-id. *See* Ex. 1001, 17:57–58. This implies that the MME information recited in claim 1 is broader, and is not limited to information that includes an MME-id. *See Phillips v. AWH Corp.,* 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc) ("Differences among claims can also be a useful guide in understanding the meaning of particular claim terms").

Accordingly, for the reasons discussed above, we maintain the construction of "MME information for identifying the MME" set forth in our Institution Decision, namely, it is "any information that can be used to identify the MME in an evolved network."

C. Level of Ordinary Skill in the Art

Petitioner, relying on the declaration testimony of Dr. Williams, argues a person of ordinary skill in the art would have had at least a master's degree in electrical engineering, computer science, or a related field, and two years of experience working with cellular telephony systems. Pet. 25 (citing Ex. 1014 ¶¶ 13–20). Patent Owner offers a slightly different definition, arguing a person of ordinary skill in the art would have had at least a bachelor's degree in electrical engineering, computer engineering, computer science, or a related field, and two to three years of experience working in mobile telecommunications systems. PO Resp. 7. Patent Owner further contends the differences between the two definitions "do not appear to affect the interpretation of the teachings of the prior art or any of the patentability issues in this proceeding." *Id.* at 8.

We adopt Petitioner's definition for a person of ordinary skill in the art, which is supported by the testimony of Dr. Williams. Nonetheless, we agree with Patent Owner that the differences between the parties competing definitions appear to be immaterial to any issue raised in this proceeding.

D. Public Accessibility of TS 23.236, TR 23.882, and S2-073255

Petitioner argues the 3GPP documents (TS 23.236, TR 23.882, and S2-073255) it relies on to challenge claims of the '166 patent were stored, indexed, and publicly accessible from 3GPP's FTP server. *See* Pet. 27–33. Petitioner relies on the testimony of Dr. Yaqub to demonstrate this public accessibility. *Id.* (citing Ex. 1012 ¶¶ 26–69).

According to Dr. Yaqub, "3GPP was formed to coordinate and facilitate the development of standards" for cellular communications. Ex. 1012 ¶ 18. 3GPP's goal "is to provide its members with an environment

to produce reports and specifications that define technologies covering cellular telecommunications." *Id.* ¶ 19. Network operators, handset manufacturers, and device manufacturers have all "been involved in the development of 3GPP standards." *Id.* ¶¶ 18–19. 3GPP members contribute technical specifications, technical reports, and feasibility studies at both Working Group and Technical Specification Group levels. *Id.* ¶¶ 20–21. Working Groups "meet regularly and also have quarterly plenary meeting[s] where member companies' contributions, draft specification[s], and other discussion documents are presented for approval." *Id.* ¶ 20.

3GPP specification development "is an ongoing, collaborative effort involving hundreds of engineers from many companies," and 3GPP catalogs that effort using "a very structured process." *Id.* ¶¶ 24, 26. 3GPP names member contributed documents using a naming procedure based on a structured numbering system, whereby the numbers by which documents are named indicate the subject matter of the documents. *Id.* ¶ 28–29 (citing Ex. 1022 §§ 4, 5A). Once named, documents are compressed and uploaded to the 3GPP FTP server as zipped files having the same name, and receive a date and time stamp indicating when the upload occurred. *Id.* ¶¶ 30, 33, 37. Once uploaded, documents are indexed on the 3GPP FTP server by subject matter (e.g., Working Group number), meeting number, and type. *Id.* ¶ 35. Documents are also effectively indexed by date due to the sequential naming/numbering system. *Id.* Documents uploaded to the 3GPP FTP server are available indefinitely and without restriction, and any interested member of the public can freely access, download, print, reproduce, and disseminate them. *Id.* ¶¶ 32–33. "Making the documents publicly available encourages discussion and promotes collaboration among Working Group

members toward the establishment of industry standards for cellular telecommunications." *Id.* ¶ 31.

Dr. Yaqub further testifies that the functionality of the 3GPP FTP server, as described above, was present in October 1999, as evidenced by a printout from the Internet Archive's "Wayback Machine," which show the October 1999 landing page of the 3GPP TSG RAN group. *Id.* ¶ 41 (citing Ex. 1024). Dr. Yaqub testifies that this printout "refreshes and confirms [his] recollection as to how 3GPP's website looked and could be navigated in 1999," and shows how "meeting information, such as Working Group documents, could be accessed by the public" at the time. *Id.* The printout of the 3GPP TSG RAN landing page shows links to the landing pages of other 3GPP groups (e.g., TSG CN, TSG SA, TSG T). Ex. 1024, 1. It also shows a link to documents generally available on the 3GPP FTP server, a link to documents from the TSG RAN group, and links to documents from various TSG RAN Working Groups (e.g., TSG RAN WG1–WG4). *Id.* For example, the printout shows a link to documents from TSG RAN WG1 directed toward the 3GPP Radio Layer 1 Specification. *Id.*

Dr. Yaqub further testifies that because the documents stored on the 3GPP FTP server were available without restriction and fully searchable, they were available "to users via conventional search engines, such as the Google search engine." Ex. 1012 ¶ 48. Regarding the specific 3GPP documents Petitioner relies on in this proceeding, Dr. Yaqub testifies that TS 23.236 was uploaded to the 3GPP FTP server on December 8, 2006, TR 23.882 was uploaded on October 25, 2007, and S2-073255 was uploaded on August 22, 2007. Ex. 1012 ¶¶ 54, 56, 58. Dr. Yaqub further testifies that each of these documents could have been located using reasonable diligence

by navigating to the 3GPP FTP site and clicking on the links corresponding to the desired subject matter, meeting number, or document number, or by performing a Google search using the terms "3GPP" and keywords within the document.[3] *Id.* ¶ 49.

Patent Owner argues Petitioner has failed to establish the public accessibility of the 3GPP documents Petitioner relies upon. PO Resp. 43–47. In particular, Patent Owner argues Petitioner has failed to demonstrate these documents were sufficiently indexed to allow an interested party to locate them prior to the priority date of the '166 patent. *Id.* at 44. Patent Owner further argues Petitioner's evidence fails to "establish the public accessibility of TS 23.236, TR 23.882 and S2-073255 as of any particular date because none of [the] evidence is specific to the references at issue." *Id.* at 44–45. Patent Owner further argues Petitioner has failed to provide any evidence that these particular 3GPP documents were "presented at any 3GPP working group meeting, physically disseminated in any manner, or electronically disseminated via e-mail as of November 1, 2007." *Id.* at 45. Patent Owner argues that Dr. Yaqub's testimony "merely establishes that the public can download TS 23.236, TR 23.882 and S2-073255 *in 2017*." *Id.* at 26–27. Therefore, Patent Owner argues, "Petitioner only provides *present*

---

[3] Dr. Yaqub further testifies that in addition to having access via the 3GPP FTP site, 3GPP members typically received an email whenever documents contributed for a Working Group meeting were uploaded to the FTP server. *Id.* ¶ 36. Moreover, each Working Group kept "minutes" of their meetings, and uploaded these to the 3GPP FTP server. *Id.* ¶ 38. These minutes were organized by subject matter or topic, as described above, and included a table of contents so that all TDocs relating to a particular subject or topic presented or discussed at the meeting could be easily located. *Id.* ¶ 39.

day evidence that an interested person is now able to access the 3GPP FTP server and download a copy of TS 23.236, TR 23.882 and S2-073255." *Id.* at 46. Finally, Patent Owner argues that Petitioner has failed to establish "that the FTP server was indexed or otherwise organized in a manner that would allow that [interested] person to conduct a meaningful search for TS 23.236, TR 23.882 and S2-073255." *Id.*

Public accessibility is "the touchstone in determining whether a reference constitutes a 'printed publication.'" *In re Hall*, 781 F.2d 897, 898–99 (Fed. Cir. 1986). A reference is publicly accessible if it "has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it." *In re Wyer*, 655 F.2d 221, 226 (CCPA 1981) (citations omitted). Public accessibility "is determined on a case-by-case basis and based on the 'facts and circumstances surrounding the reference's disclosure to members of the public.'" *In re Lister*, 583 F.3d 1307, 1311 (Fed. Cir. 2009) (quoting *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004)). The determination "is a legal conclusion based on [these] underlying factual determinations." *Kyocera Wireless Corp. v. Int'l Trade Comm'n,* 545 F.3d 1340, 1350 (Fed. Cir. 2008).

"[A] variety of factors may be useful in determining whether a reference was publicly accessible." *Lister*, 583 F.3d at 1312. Two such factors are cataloging and indexing, although neither of these factors is "a necessary condition for [a] reference to be publicly accessible." *Id.* Cataloging and indexing are most probative and relevant "in the context of references stored in libraries." *Medtronic, Inc. v. Barry*, 891 F.3d 1368, 1380 (Fed. Cir. 2018). However, such evidence is not needed to prove the

public accessibility of documents distributed at a meeting. *Id.* at 1381. To prove the public accessibility of meeting-distributed documents, the most relevant factors are "(1) 'the length of time the [document] was exhibited,' (2) 'the expertise of the target audience' (to determine how easily those who viewed the material could retain the information), (3) 'the existence (or lack thereof) of reasonable expectations that the [document] would not be copied,' and (4) 'the simplicity or ease with which the [document] could have been copied.'" *Id.* at 1381–82 (quoting *Klopfenstein*, 380 F.3d at 1350).

Upon consideration of Petitioner's evidence and Patent Owner's arguments regarding the insufficiency of that evidence, we find Petitioner has demonstrated by a preponderance of evidence that TS 23.236, TR 23.882, and S2-0735255 were publicly available before the earliest effective priority date of the '166 patent and are prior art under 35 U.S.C. § 102.

First, Dr. Yaqub has provided extensive, unrebutted, testimony regarding 3GPP's routine business practices, including (1) how 3GPP's technical specifications, reports, and TDocs were created and uploaded to 3GPP's FTP server, (2) how these documents were downloaded without restriction by hundreds of engineers from many different member companies for discussion at 3GPP working group and plenary meetings, (3) how these engineers (and other interested members of the public) had indefinite access to these documents long after the meetings had ended, and (4) how the 3GPP FTP server indexed meeting documents based on meeting date and subject. *See* Ex. 1012 ¶¶ 20–21, 24, 30–33, 35.

Although Dr. Yaqub's testimony is directed to 3GPP documents in general, its description of 3GPP's regular business practice demonstrates the

publicly accessibility of TS 23.236, TR 23.882, and S2-073255. *See Constant v. Advanced Micro-Devices, Inc*., 848 F.2d 1560, 1568–69 (Fed. Cir. 1988) ("Evidence of routine business practice can be sufficient to prove that a reference was made accessible."). TS 23.236, TR 23.882, and S2-073255, like all 3GPP documents, were generated with intent to distribute them to interested members of the telecommunications industry. They were uploaded to 3GPP's FTP server without restriction or expectation of confidentiality, and were indefinitely maintained there. They have been available for downloading (copying) from the FTP server since being uploaded, and can be shared with others without restriction. Under such circumstances, the documents are publicly accessible. *See Klopfenstein*, 380 F.3d at 1351 (finding publicly accessible a document that was easily copied and displayed for an extended period of time to persons having ordinary skill in the art without restrictions on copying). Indeed, Specifications for the related GSM (Global System for Mobile) telecommunications standard were publicly accessible because:

> GSM specifications, though drafted within smaller technical subcommittees, were widely distributed before the critical date of the [patent at issue]. Versions of the standard were "publicly available and released as consistent sets." Several U.S. companies took part in the ETSI work and had access to the GSM specifications through their European subsidiaries. The specifications themselves were visible to any member of the interested public without requesting them from an ETSI member. Further, ETSI did not impose restrictions on ETSI members to prevent them from disseminating information about the standard to non-members.

Kyocera Wireless, 545 F.3d at 1350–51 (internal citations omitted).

E. Patent Owner's Motion to Exclude

As an initial matter, Patent Owner filed a Motion to Exclude portions of TS 23.236 (Ex. 1004), TR 23.882 (Ex. 1005), S2-073255 (Ex. 1006), S2-075059 (Ex. 1010), R3-061194 (Ex. 1018), R3-060049 (Ex. 1019), S2-072750 (Ex. 1020), and the Declaration of Raziq Yaqub, Ph.D. (Ex. 1012). Paper 39 ("Mot."). Petitioner opposed the Motion (Paper 43, "Opp."), and Patent Owner replied (Paper 45, "Opp. Reply"). As the movant, Patent Owner bears the burden of establishing it is entitled to the relief requested. *See* 37 C.F.R. § 42.20. The Board decides evidentiary issues based on the Federal Rules of Evidence. *Id.* § 42.62(a). For the reasons discussed below, we deny Patent Owner's motion to exclude.

1. Declaration of Raziq Yaqub, Ph.D. (Ex. 1012)

In paragraphs 54–69 of his declaration, Dr. Yaqub opines on the authenticity, public availability, and publication dates of TS 23.236, TR 23.882, S2-073255, S2-075059, R3-061194, R3-060049, and S2-072750. *See* Ex. 1012 ("Yaqub Decl.") ¶¶ 54–69. Dr. Yaqub bases his opinion, in part, on his ability to find these documents on the 3GPP FTP server and listserv server, and the time stamps associated with these documents on those servers. *Id.* His testimony includes screen shots of portions of the 3GPP FTP server's webpage listing these documents, and URLs (universal resource locators) pointing to where these documents are located on the 3GPP FTP server. *Id.*

On December 19, 2017, Patent Owner objected to Dr. Yaqub's declaration "to the extent it relies on documents that lack authentication or contain hearsay." Paper 19, 1–2. In particular, Patent Owner objected to certain paragraphs of Dr. Yaqub's declaration that "quote, discuss, or

otherwise rely on web pages that were not filed as exhibits in this proceeding," and that "lack authentication and contain hearsay." On January 4, 2018, Petitioner provided the webpages to Patent Owner in the form of supplemental evidence. *See* Paper 20, 1; *see also* 37 C.F.R. § 42.64(b)(2). On January 11, 2018, Patent Owner objected to the webpages as lacking authentication and containing hearsay. *Id*. at 1.

Patent Owner moves to exclude paragraphs 54–69 of Dr. Yaqub's declaration "because they rely on unauthenticated webpages for the truth of the matter asserted in those webpages." Mot. 3–4. Patent Owner argues the webpages lack authentication, and contain inadmissible hearsay that Dr. Yaqub relied on in determining when TS 23.236, TR 23.882, S2-073255, S2-075059, R3-061194, R3-060049, and S2-072750 (Exs. 1004–1007, 1010, and 1018–1020) were publicly accessible on the 3GPP FTP server. *Id.* at 4–5. Petitioner argues the objected to webpages are self-authenticating, and have been authenticated by Dr. Yaqub's testimony regarding their distinctive characteristics. Opp. 3–5. Petitioner further argues the webpages "are exempt from the rule against hearsay under Federal Rules of Evidence 803(6) and 807." *Id.* at 5–6. Patent Owner responds that Dr. Yaqub is not qualified to certify the authenticity of the webpages because "[h]is declaration is silent as to his role in the [3GPP] group's recordkeeping or . . . in maintaining the accuracy of the 3GPP webpages." Opp. Reply 2.

Under Federal Rule of Evidence 803(6), records of a regularly conducted activity are not hearsay provided the opposing party has not established that the source of information or the method or circumstances of their preparation indicate a lack of trustworthiness, and the party offering the records establishes through the testimony of a qualified witness that the

records are (a) made at or near the time from information transmitted by someone with knowledge, (b) kept in the course of a regularly conducted business activity, and (c) made as a regular practice of that activity. Fed. R. Evid. 803(6). Under Federal Rule of Evidence 902(11), such records are self-authenticating provided (a) they are originals or copies that meet the requirements of Rule 803(6)(a)–(c) as shown by certification of a qualified person, (b) notice of intent to offer the records is given to the opposing party before a hearing, and (c) the records and certifications are made available to the opposing party so that the opposing party has a fair opportunity to challenge them. *Id.* at 902(11).

We first note, "[b]ecause of the general trustworthiness of regularly kept records and the need for such evidence in many cases, the business records exception [to the hearsay rule] has been construed generously in favor of admissibility." *Conoco Inc. v. Dept. of Energy*, 99 F.3d 387, 391 (Fed. Cir. 1996). Moreover "the 'custodian or other qualified witness' who must authenticate business records need not be the person who prepared or maintained the records, or even an employee of the record-keeping entity, as long as the witness understands the system used to prepare the records." *Id.* Finally, "documents that are standard records of the type regularly maintained by firms in a particular industry may require less by way of foundation testimony than less conventional documents proffered for admission as business records." *Id.* at 392; *see also Gjokaj v. U.S. Steel Corp.*, 700 Fed. App'x. 494, 502 (6th Cir.) (finding a business record certified by a qualified witness is self-authenticating under Federal Rule of Evidence 902(11)).

We find persuasive Dr. Yaqub's testimony that the 3GPP webpages

he relied upon in his declaration are authentic, and their content, including the publication dates of TS 23.236, TR 23.882, S2-073255, S2-075059, R3-061194, R3-060049, and S2-072750, are not hearsay. Dr. Yaqub is a qualifying witness for the purposes of Rule 806(b) and 902(11). *See Conoco*, 99 F.3d at 391; *see also Gjokaj*, 700 Fed. App'x. at 502. From 1998 until 2010, Dr. Yaqub worked for various entities having an interest in developing or understanding 3GPP technologies. Ex. 1012 ¶¶ 7–12. During that time, he both participated in and contributed to 3GPP standards setting organizations, was an active member in various 3GPP plenary level and working group level meetings, and was Rapporteur of Technical Feasibility Report TR 33.817. *Id.* ¶¶ 8, 11.

Dr. Yaqub testifies that 3GPP "produce[s] reports and specifications that define technologies covering cellular communications networks." *Id.* ¶ 19. The specifications are "contribution-driven by the 3GPP member companies," and produced via regularly and quarterly plenary meetings "where member companies' contributions, draft specification[s], and other discussion documents are presented for approval." *Id.* ¶ 20. Dr. Yaqub further testifies that 3GPP follows "[a] well-established process . . . for capturing accepted proposals and changes in Technical Specifications (TS) or Technical Reports (TR)." *Id.* ¶ 24. This process includes a file naming convention so that all of "the changes that are brought into the standard, from the past, present, and in the future, are well documented and controlled." *Id.* ¶ 28 (quoting Ex. 1022, 5).

Dr. Yaqub further testifies that 3GPP documents are stored on 3GPP's FTP server in zip-compressed format, where the filename of the zip file is the same as the name of the source document. *Id.* ¶ 29 (citing Ex. 1022

§ 5A). Member-contributed documents ("TDocs") are assigned unique document numbers, and "members upload these documents to 3GPP's public FTP server before, during, and after Working Group meetings." *Id.* ¶ 30. The documents are uploaded "[s]oon after the end of the meeting—the same day, or at worst within a few days." *Id.* ¶ 37. The "TDocs are publicly-available and unrestricted on the online FTP server," and are "openly published and no password is needed to access any information on the 3GPP website." *Id.* ¶ 30; *see also* Ex. 1022 § 7.6. Documents uploaded to the 3GPP FTP server "receive a date and time stamp." Ex. 1012 ¶ 33. The documents are "retained on the public 3GPP server indefinitely, and the date and time stamp can be relied upon to indicate when the upload occurred." *Id.* ¶¶ 33, 37.

Based on the foregoing testimony, we find Dr. Yaqub "understands the system used to prepare [3GPP] records," and is a "qualified witness" or "qualified person" as those terms are used in Federal Rules of Evidence 803(6) and 902(11), respectively. *See Conoco*, 99 F.3d at 391; *see also Gjokaj*, 700 Fed. Appx. at 502.

For the documents relevant to this proceeding (TS 23.236, TR 23.882, S2-073255, S2-075059, R3-061194, R3-060049, and S2-072750), Dr. Yaqub testifies that he "navigated to the relevant file" on the 3GPP FTP server, and "confirm[ed] that it had been correctly uploaded." Ex. 1012 ¶ 51. Dr. Yaqub provides the URLs he used to navigate to the documents, and testifies that he recognizes the documents located by those URLs as "true and correct" copies. *Id.* ¶¶ 54, 56, 58, 60, 62, 65, and 68. Dr. Yaqub provides screen shots of the 3GPP FTP server's directories that include the identically named zip files containing the objected to documents. *Id.* As

discussed above, when Patent Owner objected to these screen shots,
Petitioner served complete printouts of the 3GPP FTP server's directories
from which Dr. Yaqub took the screenshots. Opp. 5; *see also* Paper 19, 1–2;
Paper 20, 1; Exs. 1033–1043.

Patent Owner provides no evidence that the 3GPP FTP server, the
webpages disclosing the contents of the FTP server's directories, or the
methods or circumstances by which those webpages or their content were
prepared lack trustworthiness. *See* Mot. 3–6; Opp. Reply 1–4. By contrast,
Dr. Yaqub testifies that the contents of the 3GPP FTP server directories
(webpages) he relied upon were made and kept in the course of 3GPP's
regularly conducted business activity, and were made at or near the times
indicated by their upload date and time stamps from information transmitted
by 3GPP contributing members. *See* Ex. 1012 ¶¶ 24, 28–30, 33, 37, 54–69.
Dr. Yaqub's declaration and the webpages (printouts of the 3GPP FTP
server directories) he relied upon were served on Patent Owner with notice
of intent to use them, and Patent Owner was provided with the opportunity
to challenge the webpages and their content, as well as Dr. Yaqub's
testimony regarding how that content was created. *See* 37 C.F.R.
§ 42.51(b)(1)(ii).

Based on the evidence presented, as summarized above, we find Dr.
Yaqub's testimony sufficient to authenticate the 3GPP FTP server's
directories (webpages) and their content, such that they are admissible under
Federal Rule of Evidence 902(11) and not hearsay under Federal Rule of
Evidence 803(6). We, therefore, deny Patent Owner's motion to exclude
paragraphs 54–69 of Dr. Yaqub's declaration.

As discussed above, Petitioner also argues the 3GPP FTP server directories (webpages) Dr. Yaqub relies upon can be authenticated under Federal Rule of Evidence 901(b)(4), and their content is not hearsay under Federal Rules of Evidence 807. Opp. 4–10. Patent Owner argues to the contrary. Opp. Reply 3–4. Because we find Petitioner has shown the webpages are self-authenticating business records and their contents are not hearsay, we need not address these additional arguments. *See Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (finding an administrative agency is at liberty to reach a decision based on a single dispositive issue to "not only save the parties, the [agency], and [the reviewing] court unnecessary cost and effort," but to "greatly ease the burden on [an agency] faced with a . . . proceeding involving numerous complex issues and required by statute to reach its conclusion within rigid time limits").

2. *TS 23.236, TR 23.882, S2-073255, S2-075059, R3-061194, R3-060049, and S2-072750*

Patent Owner moves to exclude as hearsay portions of TS 23.236 (Ex. 1004), TR 23.882 (Ex. 1005), S2-073255 (Ex. 1006), S2-075059 (Ex. 1010), R3-061194 (Ex. 1018), R3-060049 (Ex. 1019), and S2-072750 (Ex. 1020) "[t]o the extent Petitioner relies on the dates within [each of these Exhibits] for the purported truth of the matter asserted to show the date of [their] public accessibility." Mot. 1–3, 6–7. Petitioner argues the contents of these documents are "exempt from the rule against hearsay under Federal Rules of Evidence 803(6) and 807." Opp. 10–13. Patent Owner argues "Dr. Yaqub's role as a 'participant in 3GPP' is insufficient to render him a qualified individual to support admission under FRE 803(6)," and that "FRE

807 is an 'exceptional' remedy that Petitioner has not justified in this case."
Opp. Reply 4–5.

For the reasons discussed in § II.E.1, *supra*, we find Dr. Yaqub is a
qualified witness who has authenticated the objected to documents, and
established their trustworthiness, so that their content is not hearsay under
Fed. R. Evid. 803(6). Patent Owner relies on *Kolmes v. World Fibers Corp*.,
107 F.3d 1534, 1542–43 (Fed. Cir. 1997), to argue that Dr. Yaqub is not a
qualified witness. We disagree. In *Kolmes*, a witness who "testified that he
had seen [certain] documents while attending a meeting," but failed to
"testify concerning the record-keeping process related to them" was found
not to be a "qualified witness" under Federal Rule of Evidence 803(6). *Id.*
In the instant case, however, Dr. Yaqub has provided extensive testimony
regarding 3GPP's record-development and record-keeping process,
including the fact that member-contributed documents uploaded to the 3GPP
FTP server are maintained indefinitely on that server as of their upload
dates. *See* Ex. 1012 ¶¶ 24, 28–30, 33, 37. Dr. Yaqub is, therefore, a
qualified witness. *See Conoco*, 99 F.3d at 391. Moreover, regarding the
specifically objected to documents, Dr. Yaqub testifies that these documents
are "true and correct" copies of the documents uploaded to the 3GPP FTP
server as of their upload dates, and provides specific URLs to the 3GPP FTP
server by which they are downloadable. *Id.* ¶¶ 54, 56, 58, 60, 62, 65, and
68.

Accordingly, for the reasons discussed here and in § II.E.1 *supra*, we
find the objected to documents (Exs. 1004–1006, 1010, and 1018–1020) are
admissible business records under Federal Rule of Evidence 902(11), and
their content is not hearsay under Federal Rule of Evidence 803(6). We,

therefore, deny Patent Owner's motion to exclude any portions of Exhibits 1004–1006, 1010, and 1018–1020. Moreover, because we find these Exhibits are admissible and not hearsay under Federal Rule of Evidence 803(6), we need not address the parties' additional arguments regarding whether these documents are admissible and not hearsay under Federal Rule of Evidence 807. *See Beloit*, 742 F.2d at 1423.

F. Overview of Prior Art

1. TS 23.236 (Ex. 1004)

TS 23.236 is a 3GPP document that discloses intra-domain connection of RAN nodes to multiple CN (central network) nodes in GSM/UTMS (i.e., 2G/3G) networks. Ex. 1004 § 1. The document discloses that when a mobile station (MS) is assigned to an SGSN (i.e., a type of CN node), the SGSN assigns the MS a P-TMSI containing the SGSN's network resource identifier (NRI). *Id*. §§ 4.3, 5.5.1. The document also discloses a procedure, shown in Figure 4, that is executed when an MS attached to an old SGSN in the 2G/3G network requests attachment to a new SGSN via a new RAN (UTRAN). *Id*. § 7.2. The relevant portion of Figure 4 is reproduced below.
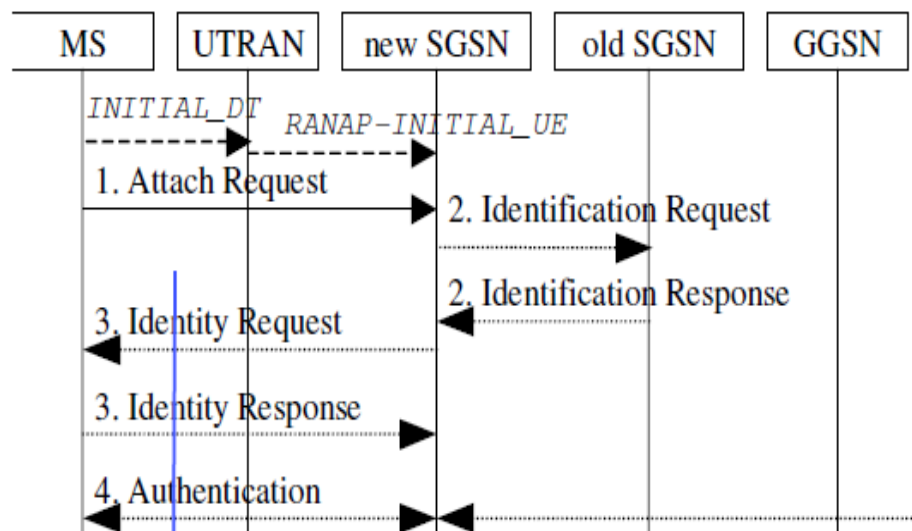
Figure 4, in the portion reproduced above, depicts the messages exchanged between a mobile station (MS), radio access node (UTRAN), previously assigned SGSN (old SGSN) and newly assigned SGSN (new SGSN) when an MS attached to the old SGSN requests attachment via a new UTRAN, which assigns the MS to a new SGSN. *Id*. The MS sends an attach request message (RRC message, step 1) to the UTRAN that includes the mobile station's P-TMSI, RAI, and P-TMSI signature, and the UTRAN selects and forwards the RRC message to a new SGSN. *Id*. The new SGSN derives the address of the old SGSN from the RAI field of the RRC message and the NRI field of the P-TMSI. *Id*. § 5.5.2. The new SGSN sends (step 2) an identification request message to the old SGSN to obtain the MS context information, and receives an identification response. *Id*. § 7.14, 7.2.

2. *TR 23.882 (Ex. 1005)*

TR 23.882 is a 3GPP study to "develop a framework for an evolution or migration of the 3GPP system to a . . . system that supports multiple RATs" or radio access technologies. Ex. 1005 § 1. The study includes "aspects of supporting mobility between heterogeneous access networks," including "how to support multiple radio access technologies and terminal mobility between different radio access technologies." *Id*. § 1(3). The study includes an information flow diagram, which is reproduced below. *Id*. § D.3.1.

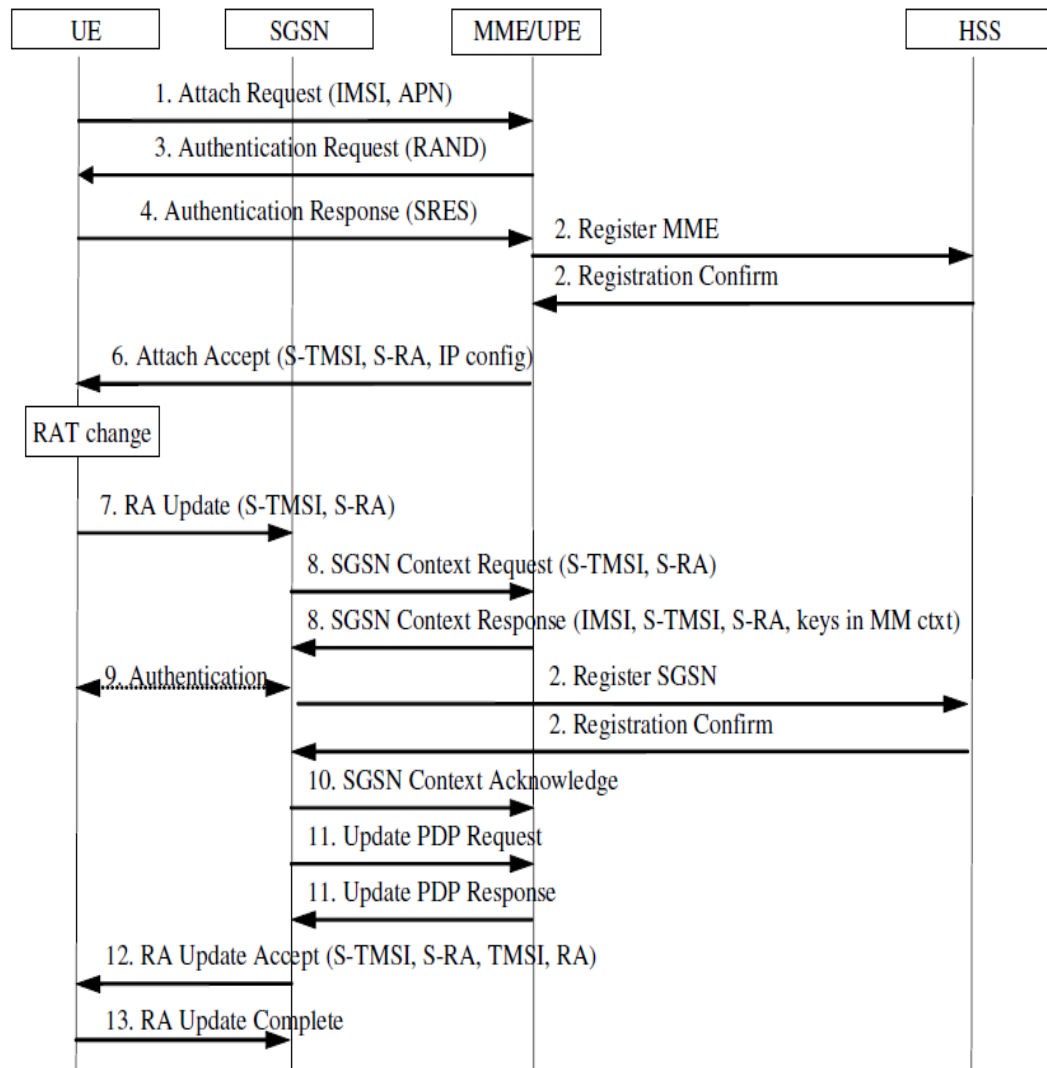## D.3.1 Attach to SAE and RAT change to 2G/3G

Figure D.3.1 is an information flow diagram depicting a method for a mobile station (UE) to first attach to an SAE (LTE) network, and to later request attachment to a 2G/3G network. *Id*. When the UE attaches to the SAE/LTE network, it sends an attach request message (step 1) to an MME in the network, and ultimately receives a response (step 6) that includes an S-TMSI. *Id*. When the UE changes RATs (between steps 6 and 7) to connect to an SGSN in a 2G/3G network, the UE sends an RAU (radio access

update) message to the SGSN (step 7) that includes the S-TMSI. The SGSN sends a context request message (step 8) that includes the S-TMSI to the MME in the LTE network, and receives a context response. *Id*. The SGSN uses the context response to authenticate (step 9) the UE on the 2G/3G network. *Id*.

TR 23.882 discloses the S-TMSI allocated by the MME on the LTE network is a temporary user identity that "is similar to P-TMSI used today in GSM/UMTS" or 2G/3G networks. Ex. 1005 § 7.20.2. TR 23.882 further discloses that "[e]ither part of the S-TMSI is used to identify the MME within a pool of MMEs or a separate MME-ID (similar to the 3G NRI) is used." *Id*. The document further discloses the MME in the LTE network can be co-localized with the SGSN in the 2G/3G network. *Id*. § D.2.9.1.

3. S2-073255 (Ex. 1006)

S2-073255 discusses the structure of LTE's S-TMSI, and was sent to 3GPP TSG SA working group 2 with a request for consideration. Ex. 1006 § 1 ("It is proposed SA2 to take the discussion into account."). The document indicates TS 23.003 defines the P-TMSI structure in 2G/3G networks and consists of a 32-bit word having a 0 to 10 bit NRI. *Id*. § 2. The document also indicates that TS 23.236, discussed above, describes intra domain connection of RAN nodes to multiple CN nodes in 2G/3G networks. *Id*. S2-073255 then discusses whether LTE's S-TMSI needs to be larger than 2G/3G's P-TMSI based on an example. *Id*. The example assumes S-TMSI reserves 21 bits for a user or subscriber-id, 7 bits for an MME-id, and 4 bits for a pool-id, thereby requiring at least 32 bits, i.e., the same number of bits as the P-TMSI. *Id*. Nonetheless, it concludes "the length of S-TMSI definitely should be expanded" because the S-TMSI also needs "to reserve

several bits for MME-restart counter to avoid double allocation of S-TMSI after MME restart." *Id*. It postpones additional consideration of whether "[o]ther bit reservation[s]" are needed for an expanded S-TMSI for future study (FFS). *Id*.

S2-073255 then discusses the impact an expanded S-TMSI would have on legacy network attachment, including the impact on the "inter RAT attach/RAU procedure" in which the UE "may need to carry S-TMSI to SGSN." *Id*. § 2. The document proposes two ways to modify the 2G/3G RRC procedure. *Id*. The first proposal is to "[r]eassign LAC and RAC [RAI fields of RRC message] as the MME id," in which case "[t]he length of MME id can be 24 bits." *Id*. The second proposal is to "[r]eassign RAC and part of P-TMSI as the MME id," and proposes "[i]f we take 6 bits out of the P-TMSI, the length of MME-id can be 14 bits." *Id*. S2-073255 includes a figure showing how information in the 2G/3G (legacy) RRC message is used to identify an old SGSN, and how the two proposals for modifying that message to carry MME information from the S-TMSI can be used to identify on old MME. That figure is reproduced below.
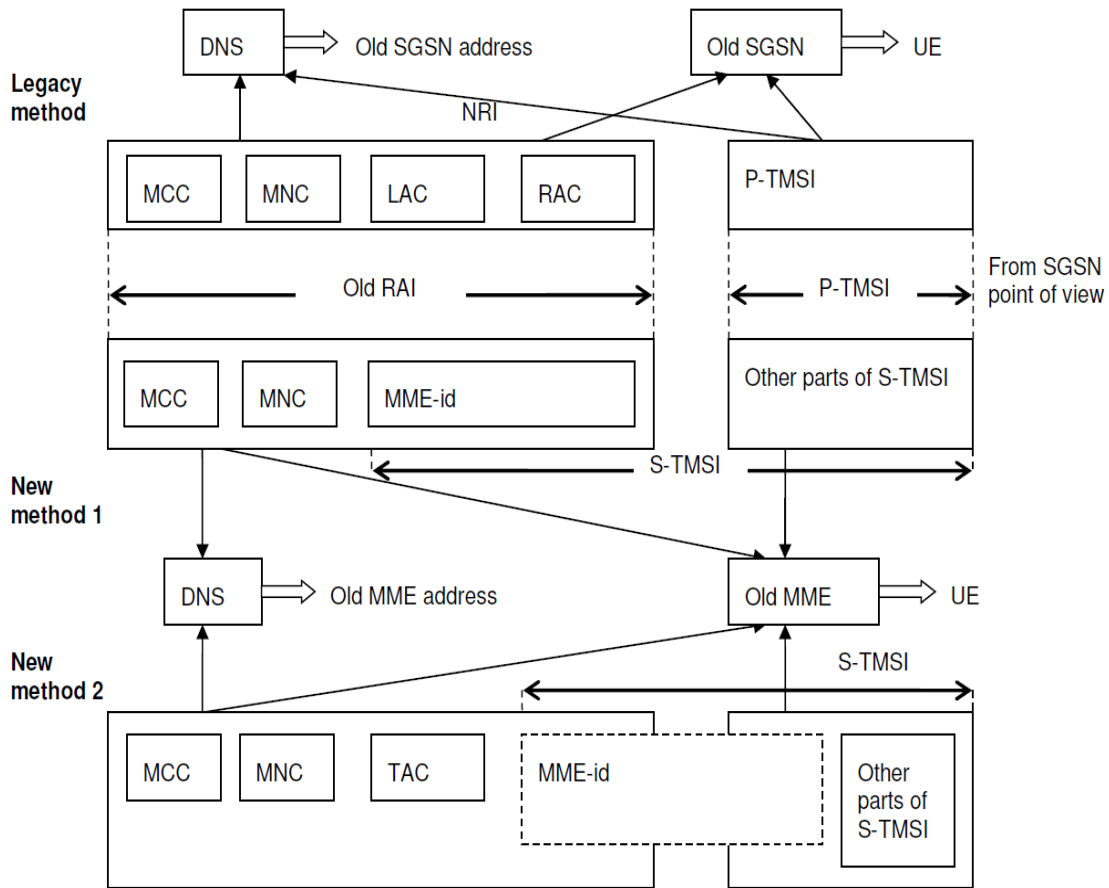
The figure depicts the structure of the 2G/3G RRC message that is sent by a UE moving between RANs in a 2G/3G network (legacy method), and two proposed modifications (methods 1 and 2) to that RRC message to be sent by a UE that moves from an LTE RAN to a 2G/3G RAN. *Id.* According to proposed method 2, the RAC field and a portion of the P-TMSI field of the RRC message is modified to carry the MME-id of the UE's S-TMSI. *Id.*

G. Patentability of Claims 1–3 and 5

Petitioner argues claims 1–3 and 5 are unpatentable as obvious over the combination of TS 23.236 and S2-073255. *See* Pet. 38–52. Patent Owner argues Petitioner has not met its burden of showing these claims are

unpatentable. *See* PO Resp. 18–42.

> *1. Claim 1*

Claim 1 recites a method for accessing a 2G/3G network, and requires
a UE to obtain a temporary identity allocated by an MME in an evolved
(LTE) network that includes MME information for identifying the MME.
Ex. 1001, 17:46–51. Petitioner demonstrates how S2-073255 discloses this
limitation. Pet. 41 (citing Ex. 1006, 3). In particular, S2-073255 discloses
"[t]he MME shall allocate an S-Temporary Mobile Subscriber Identity (S-
TMSI) to a user in order to support the subscriber identity confidentiality."
Ex. 1006, 3. "[T]he S-TMSI identifies both the user and the serving MME,"
and the "MME id in the S-TMSI is unique to ensure that the S-TMSI
remains unique." *Id.* Patent Owner does not dispute that S2-073255 teaches
this limitation. *See* PO Resp. 18–42

Claim 1 further requires the UE to add MME information from the
temporary identity to a first P-TMSI in an access message. Ex. 1001, 17:52–
54. Petitioner argues this limitation is obvious in view of the combined
teachings of TS 23.236 and S2-073255. Pet. 41 (citing Ex. 1014 ¶¶ 103–
110). In particular, Petitioner argues TS 23.236 teaches a UE, connected to
an SGSN and moving from an old RAN to a new RAN in a 2G/3G network,
sends an access message to the new RAN that includes a P-TMSI having an
NRI field that identifies the SGSN.[4] *Id.* at 42–43. Petitioner further argues

---

[4] Petitioner states the UE adds the NRI information to the P-TMSI. Pet. 42.
In our Institution Decision, we noted that TS 23.236 does not teach the UE
adds the NRI to the P-TMSI. *See* Dec. Inst. 26 n.3. Rather, an SGSN
assigns the P-TMSI to the UE, including the NRI that identifies the SGSN.
Id. Regardless, claim 1 does not require the UE to add the NRI to the P-
TMSI. It requires the UE to add MME information to the P-TMSI when the

that S2-073255 teaches a UE, connected to an MME in an LTE network and
moving from the LTE network to a 2G/3G network, sends an access
message to a RAN in the 2G/3G network that includes a P-TMSI, where
"part of [the] P-TMSI [is set] as the MMEid." *Id*. at 44 (quoting Ex. 1006,
2). Relying on the declaration testimony of Dr. Williams, Petitioner argues
that a person of ordinary skill in the art, following the teachings of TS
23.236 and S2-073255:

> [W]ould have understood that when a UE moves from an
> LTE network to a 2G or 3G network, the UE should be
> configured to add the MME-id in place of the NRI in the
> P-TMSI in the Initial Direct Transfer Message [i.e.,
> access message]. Thus, the combined teachings of TS
> 23.236 and S2- 073255 disclose the step of "adding, by
> the UE, the MME information from the temporary ID to
> a first P-Temporary Mobile Station Identity (P-TMSI) in
> an access message."

Id. at 44–45 (citing Ex. 1014 ¶ 109).

Petitioner argues a person skilled in the art would have combined the
teachings of TS 23.236 and S2- 073255 in the manner described because
both references "establish a flexible and scalable network architecture that
allow[s] multiple RAN nodes to connect to multiple CN nodes," thereby
allowing "a mobile device to move throughout the networks efficiently and
without losing continuity of service." *Id*. at 53 (citing Ex. 1004, 5, 8–9; Ex.
1006, 1–1). Petitioner argues TS 23.236 teaches the architecture and

---

UE moves from a 4G (LTE) RAN to a 2G/3G RAN. Petitioner relies on S2-
073255 for adding MME information to the P-TSMI in such a scenario. *See*
Pet. 44 (citing Ex. 1006, 2) ("S2-073255 expressly discloses adding MME
information into a P-TMSI.").

procedures that allows a UE to connect to multiple RANs in 2G/3G networks, and S2-073255 adapted these procedures to allow interoperability between 2G/3G and 4G (LTE) networks. *Id*. at 54.

Petitioner argues LTE developers knew that LTE networks needed to be interoperable with 2G/3G networks to allow UEs to move between them. *Id*. at 56 (citing Ex. 1014 ¶ 142). Relying on the declaration testimony of Dr. Williams, Petitioner argues a person of ordinary skill in the art would have recognized the teachings of TS 23.236 and S2-073255 were combinable to achieve this goal. *Id*. at 54 (citing Ex. 1014 ¶ 136). For example, Petitioner argues that LTE developers knew that when a UE moved from an LTE network to a 2G/3G network, an SGSN in the 2G/3G network would need to be able to identify an MME in the LTE network in order to retrieve the UE's context from the MME. *Id*. 56–57 (citing Ex. 1018, 2; Ex. 1019, 4–5; Ex. 1020, 3). Relying on the testimony of Dr. Williams, Petitioner argues that it was widely known that LTE networks used MME-ids to identify MMEs in the same way that 2G/3G networks used NRIs to identify SGSNs. *Id*. at 55 (citing Ex. 1005,[5] 134; Ex. 1018, 2; Ex. 1014 ¶ 138). Therefore, Petitioner argues, "[r]eplacing the NRI with the MME-id when the[] mobile device moves from an LTE to a non-LTE network would have been a simple and straightforward substitution," and would have been "nothing more than the use of a known technique to improve a similar method." *Id*. at 54–55 (citing Ex. 1014 ¶¶ 137, 140).

---

[5] Petitioner mistakenly cites page 134 of Ex. 1010—a 7-page document. The quoted material is from page 134 of Ex. 1005. We correct Petitioner's citation here, as we did in our Institution Decision. *See* Dec. Inst. 25 (citing to Ex. 1005 § 7.20.3, which is on page 134 of the Exhibit).

Petitioner further argues the substitution would have been the most logical one to apply because the 2G/3G RAN and SGSN "were already configured to look at the NRI bits of the P-TMSI to derive the old SGSN," and, would therefore be able to "look at the same bits to derive the old MME from the MME-id." *Id.* at 55 (citing Ex. 1014 ¶ 139).

Patent Owner argues Petitioner has failed to show the combination of TS 23.236 and S2-073255 teaches or suggests adding MME information to the P-TMSI of an access message as required by claim 1. PO Resp. 18–28. In particular, Patent Owner argues S2-073255 does not teach doing so because it splits an MME-id across multiple fields of the access message. *Id*. at 20–21 (citing Ex. 2002 ¶¶ 94–98). Patent Owner argues "that S2-073255 teaches adding only a *part* of an MME-id to a P-TMSI, and a *part* of an MME-id cannot identify an MME in an evolved network," and that the added part of the MME-id does not constitute "*MME information for identifying the MME*." *Id.* at 23–24 (citing Ex. 2002 ¶¶ 95–96). Relying on the testimony of Dr. Mahon, Patent Owner argues that a person of ordinary skill in the art would not have tried to add the entire MME-id to the P-TMSI based on the teachings of S2-073255 because "the complete MME-id being proposed in S2-073255 could not fit within the P-TMSI field." *Id.* at 21 (citing Ex. 2002 ¶¶ 99–100).

As explained in § II.B.2, *supra*, the broadest reasonable interpretation of MME information for identifying the MME is *any* MME information that can be used to identify the MME in the evolved network. This is the broadest reasonable interpretation because the '166 patent discloses that the information used to identify an MME can include the MME-id, pool-id, and PLMN-id depending on the type of evolved network. *See* Ex. 1001, 6:29–

31, 6:38–40, 10:7–13. Nothing in claim 1 limits the recited evolved network
to a network that does not have MME pools (i.e., that does not use pool-ids
as information for identifying MMEs). Patent Owner admits this. *See* Tr.
32:20–33:5. Thus, the MME information added to the P-TMSI in claim 1
can simply be a pool-id. The '166 patent discloses that a pool-id for
identifying an MME can be split among the P-TMSI and RAI fields of an
access message. *See* Ex. 1001, 9:15–17 ("The Pool-id may also occupy . . .
a part of RAI and a part of P-TMSI") (emphasis added). Thus, claim 1
allows splitting the MME information added to a P-TMSI (e.g., the pool-id)
among the P-TMSI and RAI fields of the access message.

S2-073255 expressly discloses splitting MME information across
different fields of the access message. In particular, it discloses that in an
"inter RAT attach/RAU procedure, [a] UE may need to carry S-TMSI to
SGSN." Ex. 1006, 2. It further discloses that one way to achieve this is to
"[r]eassign RAC and part of P-TMSI as the MME id." *Id.* That is, S2-
073255 discloses adding the MME-id information for identifying the MME
to the P-TMSI by splitting the MME-id between the P-TMSI and RAC fields
of an access message. *Id.* This is consistent with the '166 patent's
disclosure, discussed above, that the pool-id for identifying an MME can be
added to the P-TMSI by splitting it among the P-TMSI and RAI fields. *See*
Ex. 1001, 9:15–17. Thus, for this reason, S2-073255 expressly teaches this
limitation.

Moreover, even if MME information was limited to MME-id, S2-
073255 suggests this limitation. Significantly, Petitioner does not argue the
teachings of S2-073255 should be bodily incorporated into TS 23.236. That
is, Petitioner does not argue the MME-id of S2-073255 should be added to

the P-TMSI of TS 23.236 by splitting the MME-id between the P-TMSI and RAC fields of the access message. Rather, Petitioner argues that a person of ordinary skill in the would have combined the teachings of TS 23.236 and S2-073255 such that "when a UE moves from an LTE network to a 2G or 3G network, the UE should be configured to *add the MME-id in place of the NRI in the P-TMSI*." Pet. 44 (emphasis added). Petitioner supports this contention with evidence that persons of ordinary skill in the art understood the equivalence between the use of MME-ids in LTE networks and the use of the NRI field in 2G/3G networks. *See* Pet 55 (quoting Ex. 1005,[6] 134 ("MME-ID (similar to the 3G NRI)"); Ex. 1018, 12 ("Part of the P-TMSI is . . . used to identify the MME within a pool of MMEs (NRI concept)."")). "The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. . . . Rather, the test is what the combined teachings of [the] references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

Accordingly, for the reasons discussed above, we find Petitioner has demonstrated by a preponderance of evidence that the combination of TS 23.236 and S2-073255 teaches adding the MME-id of the S-TMSI to the NRI portion of the P-TMSI when a UE moves from an LTE network to a 2G/3G network.

Lastly, claim 1 requires the UE to send the access message to a RAN in the 2G/3G network. Ex. 1001, 17:55–56. Petitioner demonstrates how TS 23.236 discloses this limitation. Pet. 45–46. In particular, TS 23.236

---

[6] *See* n.5, *supra*.

discloses a UE sends an Initial Direct Transfer access message to a new RAN in a 2G/3G network when it moves to that new RAN. Ex. 1004, 20, Fig. 4 ("The Attach Request (old P-TMSI, old RAI, old P-TMSI Signature) is carried in the Initial Direct Transfer message (RRC) from the MS to the RNC."). Patent Owner does not dispute that TS 23.236 discloses this limitation.

For the reasons discussed above, having considered all the evidence and the arguments presented by Petitioner and Patent Owner, Petitioner has demonstrated by a preponderance of evidence that the combination of TS 23.236 and S2-073255 teaches all the limitations of claim 1 and has provided a rational reason to combine the teachings of these references. Accordingly, Petitioner has demonstrated that claim 1 is unpatentable over the combined teachings of TS 23.236 and S2-073255.

2. *Claim 2*

Claim 2 depends from claim 1, and further requires the MME information to include an MME-id. Ex. 1001, 17:57–58. Petitioner demonstrates how S2-073255 discloses this limitation. Pet. 46–47 (citing Ex. 1006, 2–3). In particular, S2-073255 discloses "[t]he MME shall allocate an S-Temporary Mobile Subscriber Identity (S-TMSI) to a user in order to support the subscriber identity confidentiality." Ex. 1006, 3. "[T]he S-TMSI identifies both the user and the serving MME," and the "MME id in the S-TMSI is unique to ensure that the S-TMSI remains unique." *Id.* Patent Owner does not dispute that S2-073255 teaches this limitation. *See* PO Resp. 28–42.

Claim 2 further requires the UE to add the MME information to the P-TMSI by setting the NRI of the P-TMSI to the MME-id. Ex. 1001, 59–64.

Petitioner argues this limitation is obvious over the combined teachings of TS 23.236 and S2-073255. Pet. 47–48. In particular, Petitioner argues TS 23.236 teaches adding a P-TMSI (which includes an NRI field) to an access message sent to a RAN in a 2G/3G network,[7] and S2-073255 teaches adding an MME-id to the P-TMSI field of the access message. *Id*. at 47. Relying on the testimony of Dr. Williams, Petitioner argues:

> Following the combined teachings of TS 23.236 and S2-073255, a person of ordinary skill in the art at the time of the invention would have understood that when a UE moves from an LTE network to a 2G or 3G network, the UE should be configured to add the MME-id in place of the NRI in the P-TMSI in the Initial Direct Transfer Message.

Id. at 47–48 (citing Ex. 1014 ¶ 116). As discussed in § II.G.1, *supra*, Petitioner argues this combination would have been a simple, logical, substitution because the 2G/3G RAN and SGSN "were already configured to look at the NRI bits of the P-TMSI to derive the old SGSN," and, would therefore be able to "look at the same bits to derive the old MME from the MME-id." *Id.* at 55 (citing Ex. 1014 ¶ 139).

Patent Owner argues Petitioner has failed to show the combination of TS 23.236 and S2-073255 teaches or suggests adding the MME-id to the P-TMSI of an access message as required by claim 2. PO Resp. 28–43. In

---

[7] Petitioner also argues the '166 patent describes and admits to the prior art process described in TS 23.236. *See* Pet. 47 (citing Ex. 1001, 5:44–60). We agree. The '166 patent describes the TS 23.236 process by which a UE sends an RRC access message to a new RAN that includes a P-TMSI having an NRI. The new RAN uses the NRI to identify the SGSN to which the UE is connected, and sends the RRC access message to the SGSN. *See* Ex. 1001, 5:44–60; *see also* TS 23.236, 17, 20.

particular, Patent Owner argues S2-073255 teaches away from doing so because TS 23.236 and S2-073255 both teach that the NRI is at most 10 bits long, and S2-073255 contemplates having an MME-id that is 14 or 24 bits long. *Id*. at 31–32 (citing Ex. 1004, 10; Ex. 1006, 1–2). Thus, Patent Owner argues, "[i]t would not have been possible to substitute the MME-id described in S2-073255 for the NRI field disclosed in TS 23.236 or in S2-073255." *Id.* at 32 (citing Ex. 2002 ¶ 111). Instead, Patent Owner argues, a person skilled in the art would have used some of the P-TMSI bits and some of the RAC bits to carry the longer MME-id as taught by S2-073255. *Id.* (citing Ex. 2002 ¶ 112). Patent Owner further argues the combination of TS 23.236 and S2-073255 would not have produced the result required by claim 2, which Patent Owner describes as a 2G/3G SGSN using the MME-id obtained from the NRI to retrieve the UE context from the MME-id assigning MME, without having to be re-programmed. *Id.* at 33–34.

For the reasons discussed in § II.G.1, *supra*, we agree with Petitioner that the combination of TS 23.236 and S2-073255 teaches adding the MME-id of the S-TMSI to the NRI portion of the P-TMSI when a UE moves from an LTE network to a 2G/3G network. We disagree that S2-073255 teaches away from doing so because it teaches the MME-id is too long to add to the 10-bit NRI field of the P-TMSI for the reasons discussed below.

S2-073255 is an analysis of "whether S-TMSI should be expanded and how to expand it." Ex. 1006, 1. It motivates the need to expand S-TMSI beyond the 32 bit length of P-TMSI by describing an LTE network in which 21 bits are reserved for subscriber-id, 7 bits are reserved for MME-id, 4 bits are reserved for pool-id, and additional bits (beyond these 32) are needed for an MME-restart counter. *Id.* In this embodiment, the 7-bit

MME-id is not too large to add to the 10-bit NRI field of the P-TMSI.

Patent Owner argues this embodiment of S2-073255 does not teach using a 7-bit MME-id, only the need to expand S-TMSI. PO Sur-Reply 2–5. In particular, Patent Owner argues this embodiment describes how to expand the existing Chinese network, and requires the "likely need to support 'tens of times more' terminals than the existing network." *Id.* at 2–3 (quoting Ex. 1006, 1). Therefore, Patent Owner argues, "[a] '7 bit' MME-id would not work in such a system, at least an 11 bit[8] MME-id would be required," and "the next section of S2-073255 . . . describes the actual solutions proposed." *Id.* at 3. We disagree.

Although S2-073255 does describe LTE embodiments having an expanded (14 or 24 bit) MME-id, and how these expanded MME-ids can be carried in the 2G/3G access message, S2-073255 never concludes that the MME-id should be expanded or what its expanded length should be. *See* Ex. 1006, 2. Its only conclusion is that "the S-TMSI should be expanded." *Id.* Indeed, Patent Owner and its expert ultimately admit that at the time of the invention described in the '166 patent, which occurred *after* S2-073255 was published, "the MME-id was not yet fully specified" and "neither the format nor the location of the MME-id were defined." PO Resp. 37 (citing Ex. 2002 ¶¶ 121–122); PO Sur-Reply 4 (admitting that when S2-073255 was published, "the length and format of the MME-id were not yet defined.").

As discussed above, S2-073255 does contemplate using a non-expanded 7-bit MME-id with an expanded S-TMSI. Ex. 1006, 1 (describing

---

[8] Expanding the MME-id from 7 to 11 bits would allow the Chinese network to be expanded to accommodate an additional 256 million users (i.e., 2^4 (16) pools times an additional 2^4 (16) MMEs times 1 million users per MME).

expanding S-TMSI to accommodate a 21-bit user-id, 4-bit pool-id, 7-bit MME-id, and additional bits beyond these 32 for an MME restart counter). Contrary to Patent Owner's contentions, an expanded S-TMSI with a non-expanded MME-id could expand the Chinese network to accommodate "tens times more" users. *Id.* at 1. In particular, S2-073255 proposes using an expanded S-TMSI for the Chinese network that includes "at least 4 bits" for the pool-id. *Id.* Significantly, it does not prohibit the expanded S-TMSI from including more than 4 bits for the pool-id. Expanding the pool-id from 4 bits to 9 bits would increase the number of users on the Chinese network by about 4 billion users (i.e., an additional 2^5 (32) pools times 2^7 (128) MMEs per pool times 1 million users per MME). *Id.* Expanding the MME-id from 7 to 10 bits—still small enough to be added to the NRI field of P-TMSI—would increase the number of users on the Chinese network by 128 million users (i.e., 2^4 (16) pools times an additional 2^3 (8) MMEs per pool times 1 million users per MME). *Id.*

Accordingly, for the reasons discussed above, we disagree that a person of ordinary skill in the art would have thought the MME-id disclosed in S2-073255 had to be longer than 10 bits—i.e., would be too long to add to the NRI field of the P-TMSI. We, therefore, disagree that S2-073255 teaches away from the combination proposed by Petitioner. For the same reason, we also disagree with Patent Owner's other arguments, all of which are premised on Patent Owner's argument that S2-073255 teaches MME-ids had to be larger than 10 bits. For example, we disagree with Patent Owner's argument that the proposed combination would not have achieved the results required by claim 2 because the MME-id was too big to add to the NRI field of P-TMSI. We similarly disagree with Patent Owner's argument that the

Petitioner's proposed combination was based on hindsight because the prior art teaches the MME-id was too big to be added to the NRI field of the P-TMSI. *See* PO Resp. 36–42. As discussed above, Patent Owner and its expert admit that at the time of the invention "the MME-id was not yet fully specified" and "neither the format nor the location of the MME-id were defined." PO Resp. 37 (citing Ex. 2002 ¶¶ 121–122).

For all of the reasons discussed above, we find Petitioner has demonstrated by a preponderance of evidence that the combination of TS 23.236 and S2-073255 teaches or suggests all of the limitations of claim 2, and has provided a rational reason to combine the teachings of these references. Therefore, Petitioner has demonstrated that claim 2 is unpatentable over TS 23.236 and S2-073255.

3. Claim 3

Claim 3 depends from claim 2, and requires the UE to send the access message to the RAN to enable the RAN to select an SGSN whose NRI matches the NRI in the P-TMSI of the access message. Ex. 1001, 17:65–18:3. Petitioner demonstrates how the combination of TS 23.236 and S2-073255 teaches or suggests these limitations. *See* Pet. 48–50 (citing Ex. 1004, 10, 20, Fig. 4; Ex. 1014 ¶¶ 118–120). TS 23.236 teaches that when a UE sends an RRC access message to a RAN, the RAN uses the NRI information in the P-TMSI. *See* Ex. 1004, 20, Fig. 4 ("The Attach Request (old P-TMSI, old RAI, old P-TMSI Signature) is carried in the Initial Direct Transfer Message (RRC) from the MS to the RNC."); *see also id.* at 17 ("[T]he new SGSN derives the address of the old SGSN from the old RAI and the NRI contained in the old P-TMSI/TLLI."). Patent Owner does not separately contest the patentability of claim 3. *See, generally,* PO Resp.

Accordingly, for the reasons discussed above, Petitioner has demonstrated by a preponderance of evidence that the combination of TS 23.236 and S2-073255 teaches or suggests all of the limitations of claim 3, and has provided a rational reason to combine the teachings of these references. Therefore, Petitioner has demonstrated that claim 3 is unpatentable over TS 23.236 and S2-073255.

4. *Claim 5*

Claim 5 depends from claim 3, and requires the UE to add MME information from the temporary ID to an NAS message carried by the access message. *Id*. at 18:8–12. Petitioner demonstrates how the combination of TS 23.236 and S2-073255 teaches or suggests these limitations. *See* Pet. 50–52 (citing Ex. 1004, 10, 17, 20; Ex. 1006, 2; Ex. 1014 ¶¶ 122–127). As discussed in § II.G.1–2, *supra*, S2-073255 teaches adding the MME-id to the NRI field of the P-TMSI in an RAU access message. Patent Owner does not separately contest the patentability of claim 3. *See, generally,* PO Resp.

Accordingly, for the reasons discussed above, Petitioner has demonstrated by a preponderance of evidence that the combination of TS 23.236 and S2-073255 teaches or suggests all of the limitations of claim 5, and has provided a rational reason to combine the teachings of these references. Therefore, Petitioner has demonstrated that claim 5 is unpatentable over TS 23.236 and S2-073255.

H. *Patentability of claim 4*

Claim 4 depends from claim 3, and requires the SGSN of claim 3 to be a combined MME/SGSN, and for the NRI of the combined MME/SGSN to be set to a value that is identical to the MME-id of the combined MME/SGSN. *Id*. at 18:4–7. Petitioner argues claim 4 is unpatentable as

obvious over TS 23.236, S2-073255, and TR 23.882. Pet. 59–61.

As discussed in § II.G.3, *supra*, Petitioner has demonstrated by a preponderance of evidence that the combination of TS 23.236 and S2-073255 teaches or suggests all the limitations required by claim 3. Petitioner also demonstrates by a preponderance of evidence that TR 23.882 teaches a combined MME/SGSN, and that a UE registering with either the 4G or 2G/3G network via the combined MME/SGSN would receive the same temporary identity or TMSI from the combined MME/SGSN. Pet. 59–60 (citing Ex. 1005, 170–171). Relying on the testimony of Dr. Williams, Petitioner argues that a person of ordinary skill in the art would have known that the UE would receive an MME-id from the combined MME/SGSN when it registers with the 4G network. *Id.* at 60–61 (citing Ex. 1014 ¶ 149). Petitioner further argues that a person of ordinary skill in the art would have found it obvious to set the NRI field of the P-TMSI to the MME-id "so that a new RAN node could derive and select the combined MME/SGSN when the UE moves to [a] non-LTE network." *Id*. at 61.

Petitioner argues a person of ordinary skill in the art would have combined the teachings of TR 23.882, TS 23.236, and S2-073255 for the same reasons they would have combined the teachings of TS 23.236 and S2-073255 as discussed in § II.G.1, *supra*—to allow internetworking between 4G and 2G/3G networks. *Id*. Petitioner further argues other prior art references at the time of the invention expressly motivate the combination by teaching "[i]n order to support good inter-working with existing 2G and 3G networks and support features like . . . limit[ed] Idle mode signaling in LTE_IDLE it is necessary that an identity allocated in one access is valid also in another access." *Id*. (quoting Ex. 1018, 2). Patent Owner does not

52

contest Petitioner's rationale for combining the teachings of TS 23.236, S2-073255, and TR 23.882, but argues the combination fails for the same reasons argued above with respect to claims 1 and 2. PO Resp. 42–43.

Upon consideration of the arguments and evidence presented by Petitioner and Patent Owner, we find Petitioner has demonstrated by a preponderance of evidence that the combination of TS 23.236, S2-073255, and TR 23.882 teaches all of the limitations of claim 4. Petitioner has demonstrated the combination teaches all the elements of claims 1–3, from which claim 4 directly or indirectly depends, for the reasons discussed in §§ II.G.1–3, *supra*. Petitioner demonstrates that TR 23.882 teaches a combined MME/SGSN core network element. *See* Ex. 1005, 170 ("This mechanism is based on the architecture . . . where MME is co-localised with 2G/3G SGSN. . ."). Petitioner further demonstrates that when a UE registers with a 4G network through a combined MME/SGSN it receives an MME-id, such that "a[n] NRI of the combined MME/SGSN is set at a value that is identical to the MME-id of the combined MME/SGSN" as required by claim 4. *Id.* at 170–171. As discussed above, Petitioner has set forth a reasonable and rational basis for combining the teachings of these references—to allow internetworking between 2G/3G and 4G networks— and has demonstrated that the prior art expressly suggests this goal. *See* Ex. 1018, 2.

Accordingly, for the reasons discussed above, we find Petitioner has demonstrated by a preponderance of evidence that claim 4 is unpatentable over the combination of TS 23.236, S2-073255, and TR 23.882.

I. Patentability of claims 12–16

Petitioner argues claims 12–14 and 16 are unpatentable as obvious over TS 23.236 and S2-073255 with or without Shaheen. *See* Pet. 52–58,

62–63. Petitioner argues claim 15 is unpatentable as obvious over TS 23.236, S2-073255, and TR 23.882 with or without Shaheen. *Id*. at 59–61, 64.

"[I]n an inter partes review the petitioner is master of its complaint and normally entitled to judgment on all of the claims it raises." *SAS*, 138 S.Ct. at 1355. Moreover, "the Board *must* address *every* claim the petitioner has challenged." *Id*. at 1354. Addressing the merits of Petitioner's various challenges of claims 12–16 requires "construing the claim[s], a question of law for the court, followed by . . . a comparison of the construed claim[s] to the prior art." *Key Pharms. v. Hercon Labs. Corp.*, 161 F.3d 709, 714 (Fed. Cir. 1998); *see also Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 391 (1996) (claim construction "is an issue for the judge."). However, in an *inter partes* review, Petitioner may not challenge claims as indefinite under 35 U.S.C. § 112 ¶ 2. *See* 35 U.S.C. § 311(b).

As discussed in § II.B.1, *supra*, claims 12–16 include an "MME information adding module" limitation written in means-plus-function format. Ex. 1001, 18:48–62, 18:63–19:14; *see also* 35 U.S.C. § 112, ¶ 5. To address Petitioner's challenge of these claims on the merits, we must first construe the "MME information adding module" limitation by identifying the structures, materials, and acts disclosed in the '166 patent corresponding to the functions performed by this module. *See* 35 U.S.C. § 112 ¶ 6; *see also Markman*, 517 U.S. at 391 (claim construction "is an issue for the judge."). Petitioner fails to identify the structures, materials, and acts disclosed in the specification for performing the recited functions of the "MME information adding module." *See* 37 C.F.R. § 42.104(b)(3). Additionally, after independent review, we do not find any description in the '166 patent of a

structure that is linked to the functions performed by the "MME information

adding module." *See Braun Medical, Inc. v. Abbot Laboratories*, 124 F.3d

1419, 1424 (Fed. Cir. 1997) (finding a disclosed structure is "corresponding"

structure only "if the specification or prosecution history clearly links or

associates that structure to the function recited in the claim").

A claim limitation written in means-plus-function format must be

supported by corresponding structure in the Specification that performs the

functions recited in the claim limitation. *See Williamson*, 792 F.3d 1351–52;

see also In re Donaldson Co., Inc., 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en

banc). For computer-implemented limitations, the corresponding structure

must include an algorithm needed to transform any disclosed general-

purpose computer into a special-purpose computer programmed to perform

the recited functions. *See Williamson*, 792 F.3d at 1352; *see also Aristocrat*

Techs. Australia Pty Ltd. v. Int'l Game Tech., 521 F.3d 1328, 1333, 1338

(Fed. Cir. 2008). The algorithm may be described in prose, as a formula, as

a flow chart, or "in any other manner that provides sufficient structure."

Finisar Corp. v. DirecTV Group, Inc., 523 F.3d 1323, 1340 (Fed. Cir. 2008).

However, mere reference to a general-purpose computer without description

of the algorithm executed by that computer, or to software without

description of the algorithm needed to accomplish the software function, is

inadequate disclosure. *Williamson*, 792 F.3d at 1352; *Finisar*, 523 F.3d at

1340–41. Likewise, simply disclosing the claimed function does not

constitute adequate disclosure of the structure needed to perform that

function. *Blackboard, Inc. v. Desire2Learn, Inc*., 574 F.3d 1371, 1384 (Fed.

Cir. 2009).

One of the functions performed by the claimed "MME information

adding module" is "to add the MME information from the temporary ID to a first P-Temporary Mobile Station Identity (P-TMSI) in an access message, when the UE attempts to accessa [sic] 2G/3G network." Ex. 1001, 18:55–59. The '166 patent discloses the UE performing this function in several places. *Id.* at 3:51–53, 3:62–65, 4:8–11, 4:16–19, 6:29–42, 7:37–42, 7:49–53, 8:65–9:5, 9:12–17, 10:14–20, 10:37–39, 10:51–55, 13:23–26, 14:5–8, 14:18–20, Fig. 5. However, all of these disclosures simply recite the function performed by the UE—adding certain MME information to a P-TMSI in an access message—without reciting any particular structure that is capable of performing that function. The '166 patent also depicts the "MME information adding module" as a black box having little to no internal structure, and fails to disclose any structure within the black box that performs the function of adding MME information from a temporary ID to a P-TMSI in an access message. *Id.* at 3:56–58, 13:35–49, 13:66–67, Figs. 11–12; *see also id*. at 14:5–8 ("The MME information adding module 202 is configured to add the MME information from the temporary ID to a first P-TMSI in an access message, when the UE [is] accessing a 2G/3G network."). At best, the '166 patent discloses the "MME information adding module" includes a number of black boxes—including a "P-TMSI information adding submodule"—but again without disclosing any structure within that submodule that actually performs the function of adding MME information from a temporary ID to a P-TMSI in an access message. *Id*. at 13:46–49, Fig. 11 ("The MME information adding module 120 includes a P-TMSI information adding submodule 121, which is adapted to add the MME-id in an SAE-TMSI to the P-TMSI information of the access message.").

For the reasons discussed above, we find the '166 patent fails to disclose or describe corresponding structure that is linked to and performs the functions of the claimed "MME information adding module." *See Braun*, 124 F.3d at 1424 (Fed. Cir. 1997). This leaves us unable to construe the meaning of this limitation, commonly recited in each of claims 12–16. It also leaves us unable to determine whether the TS 23.236 and S2-073255 combination, the TS 23.236, S2-073255, and Shaheen combination, the TS 23.236, S2-073255, and TR 23.882 combination, or the TS 23.236, S2-073255, TR 23.882, and Shaheen combination teaches the same or equivalent structures for performing the recited functions of the "MME information adding module."

Accordingly, for this reason, Petitioner has failed to demonstrate by a preponderance of evidence that claims 12–14, and 16 are unpatentable over the combination of TS 23.236 and S2-073255 or over the combination of TS 23.236, S2-073255, and Shaheen. For the same reason, Petitioner has failed to demonstrate by a preponderance of evidence that claim 15 is unpatentable over the combination of TS 23.236, S2-073255, and TR 23.882, or over the combination of TS 23.236, S2-073255, TR 23.882, and Shaheen.

III. CONCLUSION

We have reviewed the Petition, Patent Owner's Response and Supplemental Response, Petitioner's Reply, and Patent Owner's Sur-Reply. We have considered all of the arguments made by Petitioner and Patent Owner, as well as all of the evidence for and against obviousness. We have weighed and assessed the entirety of the evidence as a whole.

For the reasons discussed in § II.G, *supra*, Petitioner has demonstrated by a preponderance of evidence that claims 1–3 and 5 of the '166 patent are

unpatentable as obvious over the combination of TS 23.236 and S2-073255.

For the reasons discussed in § II.H, *supra*, Petitioner has demonstrated by a

preponderance of evidence that claim 4 of the '166 patent is unpatentable as

obvious over the combination of TS 23.236, S2-073255, and TR 23.882.

Finally, for the reasons discussed in §§ II.B1 and II.I, *supra*, we are unable

to construe the "MME information adding module" limitation recited in

claims 12–16. We are therefore unable to analyze the merits of Petitioner's

challenges of these claims. Accordingly, for this reason, Petitioner has

failed to demonstrate by a preponderance of evidence that claims 12–14 and

16 are unpatentable over the combination of TS 23.236 and S2-073255 or

over the combination of TS 23.236, S2-073255, and Shaheen. For the same

reason, Petitioner has failed to demonstrate by a preponderance of evidence

that claim 15 is unpatentable over the combination of TS 23.236, S2-

073255, and TR 23.882 or over the combination of TS 23.236, S2-073255,

TR 23.882, and Shaheen.

IV.   ORDER

It is hereby:

ORDERED that claims 1–5 of the '166 patent are unpatentable;

FURTHER ORDERED that Petitioner has not shown that claims 12–14 and 16 of the '166 patent are unpatentable over TS 23.236 and S2-073255;

FURTHER ORDERED that Petitioner has not shown that claims 12–14 and 16 of the '166 patent are unpatentable over TS 23.236, S2-073255, and Shaheen;

FURTHER ORDERED that Petitioner has not shown that claim 15 of the '166 patent is unpatentable over TS 23.236 and S2-073255;

FURTHER ORDERED that Petitioner has not shown that claim 15 of the '166 patent is unpatentable over TS 23.236, S2-073255, and Shaheen;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *denied*; and

FURTHER ORDERED that, because this Decision is final, a party to this proceeding seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

For PETITIONER:

Kevin P.B. Johnson
Marissa Ducca
Deepa Acharya
Jared Newton
Brian Mack
kevinjohnson@quinnemanuel.com
marissaducca@quinnemanuel.com
deepaacharya@quinnemanuel.com
jarednewton@quinnemanuel.com
brianmack@quinnemanuel.com

For PATENT OWNER:

Jeffrey P. Kushan
Joseph A. Micallef
iprnotices@sidley.com