

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC.,
Petitioner,

v.

KONINKLIJKE KPN N.V.,
Patent Owner.

IPR2022-00079
Patent RE48,089

Before KEVIN F. TURNER, NORMAN H. BEAMER, and
RUSSELL E. CASS, *Administrative Patent Judges*.

CASS, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background

In this *inter partes* review, Ericsson Inc. (“Petitioner”) challenges the patentability of claims 1–5, 11, and 13–15 (the “challenged claims”) of U.S. Patent No. RE48,089 (Ex. 1001, “the ’089 patent”), which is assigned to Koninklijke KPN N.V. (“Patent Owner”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision, issued pursuant to 35 U.S.C. § 318(a), addresses issues and arguments raised during the trial in this *inter partes* review. For the reasons discussed below, Petitioner has proven by a preponderance of the evidence that claims 1–5, 11, and 13–15 are unpatentable.

B. Procedural History

In this proceeding, Petitioner relies upon the following references:

Olofsson, WO Pub. No. 2010/034157 A1, published Apr. 1, 2010 (Ex. 1006); and

Kuruville, US 2009/0181664 A1, published Jul. 16, 2009 (Ex. 1007).

Pet. v, 22–91.

Petitioner submits declarations from Dr. Michael Kotzin (Exs. 1003, 1036). Patent Owner submits a declaration from Dr. Radostin Pachamanov (Ex. 2008).

Petitioner challenges the patentability of claims 1–5, 11, and 13–15 of the ’089 patent based on the following ground:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–5, 11, and 13–15	103(a) ¹	Olofsson, Kuruvilla

Pet. ii, 22. Patent Owner filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). We instituted trial on all grounds of unpatentability. Paper 9 (“Inst. Dec.”), 49.

During the trial, Patent Owner filed a Response (Paper 13, “PO Resp.”), Petitioner filed a Reply (Paper 18, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 22, “PO Sur-reply”).

An oral hearing was held on March 7, 2023, a transcript of which appears in the record. Paper 28 (“Tr.”).

C. Real Parties in Interest

Petitioner states that the real parties in interest are Ericsson Inc. and Telefonaktiebolaget LM Ericsson. Pet. 1. Patent Owner states that Koninklijke KPN N.V. is the real party in interest. Paper 3, 2.

D. Related Proceedings

The parties state that the ’089 patent was asserted in *Koninklijke KPN NV v. Telefonaktiebolaget LM Ericsson*, Case No. 2-21-cv-00113 (E.D. Tex.) (the “Texas litigation”), which was filed on March 31, 2021. Pet. 1–2; Paper 3, 2.

E. The ’089 Patent (Ex. 1001)

The ’089 patent is directed to “a method and system for assessing coverage in a wireless access network.” Ex. 1001, code (57). The

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), included revisions to 35 U.S.C. §§ 103 and 112 that became effective after the filing of the application that led to the ’089 patent. Therefore, we apply the pre-AIA versions of 35 U.S.C. §§ 103 and 112.

background of the '089 patent explains that “[i]n order to provide adequate service to the clients, wireless operators constantly evaluate the coverage area of their wireless access networks.” *Id.* at 1:34–36. This evaluation can be performed using “drive tests,” which consist of measurement routes that are traversed by a measurement terminal often mounted on a vehicle. *Id.* at 1:46–51. The '089 patent explains that these drive tests have several drawbacks, including that they provide coverage assessment only along the measurement route, and are too costly for estimation of overall coverage. *Id.* at 1:67–2:3.

According to the '089 patent, the invention seeks to overcome these drawbacks by providing a system that uses “terminals capable of measurement and reporting across the different wireless access networks.” Ex. 1001, code (57). An example of such a system is disclosed in Figure 3, reproduced below.

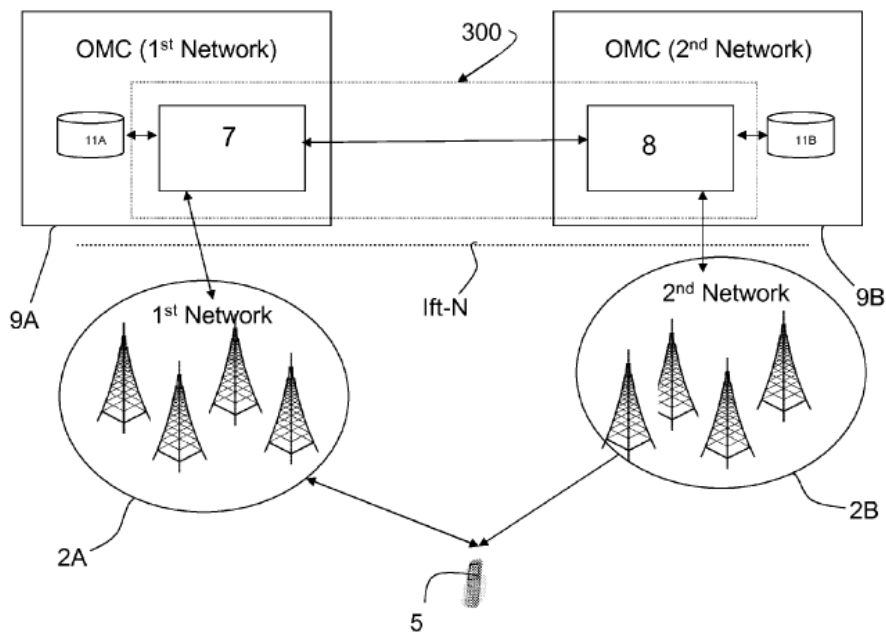


FIG. 3

Figure 3 shows a coverage assessment system according to one embodiment of the invention of the '089 patent. Ex. 1001, Fig. 3, 6:18–20.

Figure 3 depicts coverage assessment system 300, including information collector 7 and coverage estimator 8. Ex. 1001, 7:10–14. Information collector 7 “is configured for collecting information from some of the terminals 5 via the first wireless access network 2A and providing the information to the coverage estimator 8.” *Id.* at 7:14–17. Coverage estimator 8 “is configured for connecting to and receiving information from the information collector and, based on the received information, generating the coverage assessment for the second wireless access network 2B.” *Id.* at 7:17–21. In the embodiment shown in Figure 3, “information collector 7 is included within an [operation and maintenance center (]OMC[])] 9A of the first wireless access network 2A and the coverage estimator 8 is included within OMC 9B of the second wireless access network 2B.” *Id.* at 7:22–26. “Alternatively,” the ’089 patent explains, “the first and second wireless access networks 2A, 2B may share the same OMC.” *Id.* at 7:26–27.

The ’089 patent explains that information collector 7 and coverage estimator 8 “may be largely implemented as software executed by a processor and making use of memory,” but may also “be implemented in hardware or a combination of software and hardware.” Ex. 1001, 7:28–34.

A flow diagram of method steps for generating the coverage assessment is shown in Figure 4, reproduced below.

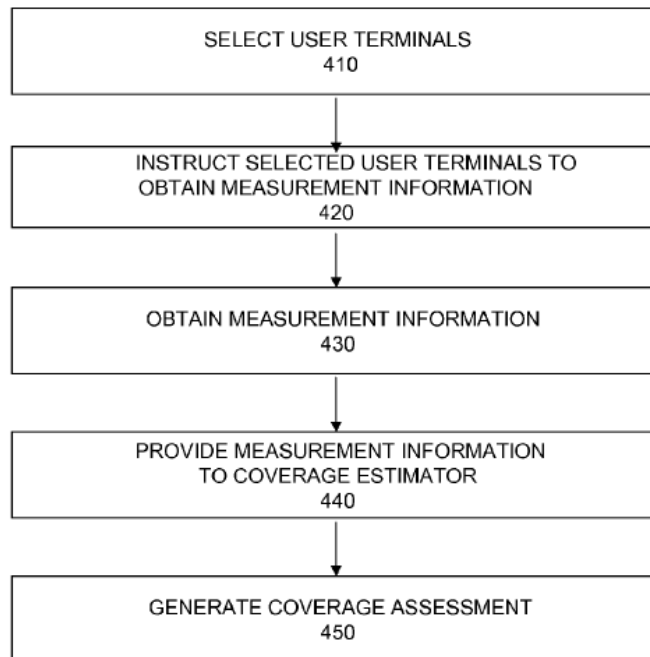


FIG. 4

Figure 4 is a flow diagram of method steps for generating a coverage assessment for a wireless access network. Ex. 1001, Fig. 4, 6:21–25.

In step 410, “information collector 7 selects one or more of the terminals 5 for obtaining measurement information.” Ex. 1001, 8:34–36. In step 420, “information collector 7 instructs the selected one or more terminals [from the first network] to measure signals from the [second] network.” *Id.* at 8:66–9:1. In step 430, “information collector 7 obtains measurement information indicative of the signals measured from the [second] network by the selected one or more terminals.” *Id.* at 9:1–4. In step 440, “information collector 7 forwards the measurement information obtained from the selected terminals to the coverage estimator 8 within the [second] network.” *Id.* at 9:62–65. Finally, in step 450, “coverage estimator 8 generates the coverage assessment for the [second] network based on the information obtained from the information collector.” *Id.* at 10:11–13. The coverage assessment “is generated by assembling a coverage map,

representing the geographic locations/pixels with associated signal strengths of the second network.” *Id.* at 10:13–16.

F. Illustrative Claims

Of challenged claims 1–5, 11, and 13–15, claims 1, 11, 13, and 15 are independent. For purposes of the issues raised in this proceeding, claim 1 is illustrative and is reproduced below.

1. [preamble] An automatic coverage assessment system configured for generating a coverage assessment for a second wireless access network of a telecommunications infrastructure comprising a first wireless access network and the second wireless access network, the first and second wireless access networks capable of providing services to a plurality of terminals, the system comprising:

1[a] an information collector; and

1[b] a coverage estimator;

1[a][i] wherein the information collector is configured to:

(i) select one or more terminals from at least part of the plurality of the terminals, the at least part of the plurality of the terminals capable of communicating with both the first wireless access network and the second wireless access network,

1[a][ii] (ii) instruct the selected one or more terminals to measure signals from the second wireless access network;

1[a][iii] (iii) obtain measurement information indicative of the signals measured from the second wireless access network by the selected one or more terminals, and

1[a][iv] (iv) provide the measurement information to the coverage estimator, and

1[b][i] wherein the coverage estimator is configured to:

(i) obtain measurement information from the information collector, and

1[b][ii] (ii) based on the obtained measurement information, generate the coverage assessment for the second wireless access network of the telecommunications infrastructure.

Ex. 1001, 11:44–12:6 (bracketed paragraph identifiers added).

II. DISCUSSION

A. Claim Construction

A claim “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b).” 37 C.F.R. § 42.100(b) (2020).

1. “Coverage Assessment”

Petitioner proposes that the term “coverage assessment” be construed, “consistent with the specification’s definition,” to mean “a ‘representation of locations/pixels and associated signal strengths.’” Pet. 16 (citing Ex. 1001, 5:20–22). Patent Owner does not dispute this definition in its Patent Owner Response. PO Resp. 12–21. We agree that Petitioner’s proposed construction of “coverage assessment” is consistent with how that term is used in the ’089 patent specification. *See* Ex. 1001, 5:20–22 (referring to “the coverage assessment (i.e., a representation of locations/pixels and e.g. associated signal strengths of the second wireless access network)”).

Accordingly, we apply Petitioner’s construction of “coverage assessment” in this Decision.

2. Preambles – “first and second wireless networks capable of providing services to a plurality of terminals”

Patent Owner argues that the language in the preambles reciting “first and second wireless networks capable of providing services to a plurality of terminals” is limiting and should be construed to require “a system, mobile user terminal, or network node for a telecommunications infrastructure

comprising first and second wireless access networks, ***which are both operational and capable of providing services to a plurality of terminals.***” PO Resp. 12 (emphasis added). First, Patent Owner asserts, this claim phrase is limiting because it “serves as an antecedent basis for claim elements,” noting that the independent claims “refer to the ‘first wireless access network’ and ‘second wireless access network,’ which refer to the use of those terms in the preambles of those claims.” *Id.* at 12–13 (citing Ex. 1001, 11:56–57; 13:33–34; 14:33–34; 14:66–67).

Second, Patent Owner contends that this claim language “is a necessary and defining aspect of the invention” because at least a portion of the mobile terminals can communicate with both networks. PO Resp. 13 (internal quotation marks omitted). According to Patent Owner, the ’089 patent specification “explains that the invention is applicable in ‘areas where several wireless access networks are cooperating, for example in terms of inter-RAT [(radio access technology)] handover and/or cell reselection,’ which implies that both wireless access systems are operational, and importantly, that they are both open for ‘providing services’ to mobile subscribers” because “mechanisms such as ‘handover’ or ‘cell reselection’ are supported only if mobile terminals can switch service from one network to another.” *Id.* (citing Ex. 1001, 6:45–48; Ex. 2008 ¶ 42).

Petitioner disagrees. Pet. Reply 1–3. First, Petitioner argues that the preamble is not limiting because it “merely states the invention’s purpose, and thus does not limit the claims’ scope.” *Id.* at 1. Petitioner also responds to Patent Owner’s argument that the disputed phrase in the preamble provides antecedent basis for elements in the body of the claim by contending that “[t]he body of the claim does not refer back to the ‘capable

of providing services' clause on which [Patent Owner] bases its proposed construction." *Id.*

Second, Petitioner argues that even if the preamble is limiting, Patent Owner "fails to justify importing the requirement that the networks be commercially 'operational,' thereby excluding embodiments that are capable of providing services but [not] yet fully deployed." Pet. Reply 2. Petitioner asserts that the preamble recites only that the networks be "capable of providing services to terminals," which Patent Owner's expert testified that one of ordinary skill "would have understood to mean 'available to provide service,' 'possible to connect' to the network,' or 'have the ability to connect' to the network." *Id.* (citing Ex. 1034, 37:3–39:2). Petitioner also argues that the portions of the specification upon which Patent Owner relies as disclosing operational networks (Ex. 1001, 6:40–48) "expressly clarif[y] that the patent is '*not limited to*' such example networks." Pet. Reply 2. (citing Ex. 1001, 6:45). Petitioner further contends that Patent Owner's construction "reads out express embodiments of the second network that include emerging or not-yet-deployed networks," such as an LTE network that may be "at the beginning of the LTE deployment." *Id.* (citing Ex. 1001, 7:59–65). Finally, Petitioner argues that the '089 patent also describes evaluating coverage for networks "currently 'out of coverage' by the prior art solutions." *Id.* at 2–3 (citing Ex. 1001, 3:58–61).

Patent Owner responds that the phrase "not limited to" in column 6, line 45 of the '089 patent specification upon which Petitioner relies "refers to the *areas of cooperation*, not to the *type of networks*." PO Sur-reply 5–6. Patent Owner also argues that the '089 patent specification's statement that the second network may be an LTE network "at the beginning of the LTE

deployment” refers “to the gradual commercial roll-out of LTE networks, during which, when partially deployed, the newly commercially operational LTE may have patchy service that can be assessed by the ’089 [p]atent system.” *Id.* at 7 (citing Ex. 1001, 7:59–65; Ex. 2008 ¶ 42). According to Patent Owner, “with a newly commercially operational LTE network, just as with other networks when using the ’089 [p]atent system, the claim preambles require that both first and second networks are ‘capable of providing services.’” *Id.* (citing Ex. 2008 ¶ 42).

We do not agree with Patent Owner that the phrase “first and second wireless networks capable of providing services to a plurality of terminals” should be construed to mean that the networks “are both *operational* and capable of providing services to a plurality of terminals.” PO Resp. 12 (emphasis added). First, nothing in the claim language itself suggests that the networks must be “operational” as well as being “capable of providing services to a plurality of terminals.” Second, we disagree that reading in the term “operational” is justified by the language in the ’089 patent specification stating that the invention is applicable “in areas where several wireless access networks are cooperating, for example in terms of inter-RAT handover and/or cell reselection.” *Id.* at 13 (citing Ex. 1001, 6:45–48). This portion of the specification expressly states that the invention is “not limited to” such applications, indicating that they should not be read into the claims where (as here) they are not recited. Ex. 1001, 6:45.

Moreover, we find that adding “operational” into the construction of the claim language would only serve to add ambiguity to the scope of the claim. Neither Patent Owner nor the ’089 patent explains what is meant by an “operational” network, or how a network that is “operational” differs

from one that is “capable of providing services to a plurality of terminals.” Therefore, we decline to add the requirement that the networks be “operational” into the claim language, as Patent Owner contends, and conclude that no further interpretation of the preamble language is necessary.

As further discussed below with respect to claim 1, we find that the combination of Olofsson and Kuruvilla teaches first and second wireless networks “capable of providing services to a plurality of terminals,” as set forth in the preamble. *See* § II.D.4(a), *infra*. Therefore, we need not determine whether this language in the preamble is limiting for purposes of this Decision.

3. “Means-Plus-Function” Limitations

Claims 11, 13, and 15 include a number of limitations that recite “means for” followed by a function, and Petitioner argues that Section 112, paragraph 6 applies to these limitations. Pet. 16–22. Petitioner also argues that claim 1 recites “that the ‘information collector’ and ‘coverage estimator’ are ‘configured to’ or ‘carr[y] out operations’ to perform certain recited functionality, without reciting sufficient structure for performing those functions.” *Id.* at 17 (alteration in original). Petitioner further asserts that the terms “information collector” and “coverage estimator” are nonce terms subject to Section 112, paragraph 6. *Id.* (citing *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015)). Accordingly, Petitioner argues, these limitations of claim 1 also invoke Section 112, paragraph 6. *Id.* In its Preliminary Response, Patent Owner did not address the issue of whether these claim elements invoke Section 112, paragraph 6. Prelim. Resp. 17–25.

In our Institution Decision, we applied Petitioner’s proposed identification of structure and function under Section 112, paragraph 6 for the “means for” claim elements as well as for the terms “information collector” and “coverage estimator,” consistent with the district court’s claim construction order in the Texas litigation, which found that these claim elements invoke Section 112, paragraph 6. Inst. Dec. 17 (citing Ex. 1027, 33–35, 49).

Petitioner’s identifications of function and structure for the various claim elements that it interprets under Section 112, paragraph 6, are discussed below.

Selecting, Associating and Generating Limitations

Limitations	Structure and Function
13[a] “means for selecting one or more terminals . . . second wireless access network;” Limitations 1[a][i] ² , 11[d][i], 15[c][i].	<u>Function</u> : select one or more terminals from at least part of the plurality of the terminals, the at least part of the plurality of the terminals capable of communicating with both the first wireless access network and the second wireless access network <u>Structure</u> : processor implementing an algorithm to select one or more terminals from at least part of the plurality of the terminals, the at least part of the plurality of the terminals capable of communicating with both the first wireless access network and the second wireless

² As discussed further in Section II.A.4 below, the “information collector” includes the corresponding structure for all of the functions recited in limitations 1[a][i]–1[a][iv].

<p>4[a] “information collector is further configured to associate the location information with at least one of the selected one or more terminals”</p>	<p>access network</p> <p><u>Function</u>: associate the location information with at least one of the selected one or more terminals</p> <p><u>Structure</u>: processor implementing an algorithm that associates the location information with at least one of the selected one or more terminals</p>
<p>15[b] “means for generating the coverage assessment . . . measurement information”</p> <p>Limitations 1[b][ii]³, 11[f][ii], 13[e].</p>	<p><u>Function</u>: generate the coverage assessment for the second wireless access network of the telecommunications infrastructure based on the obtained measurement information</p> <p><u>Structure</u>: processor implementing an algorithm that generates the coverage assessment for the second wireless access network of the telecommunications infrastructure</p>

Pet. 17–18. Petitioner asserts that the ’089 patent “describes information collector 7 as generic ‘software executed by a processor and making use of memory,’ ‘hardware or in a combination of software and hardware,’ which would include one or more processors implementing an algorithm to perform these respective functionalities.” *Id.* at 18 (citing Ex. 1003 ¶ 78; Ex. 1001, 7:29–35).

³ As discussed further in Section II.A.5 below, the “coverage estimator” includes the corresponding structure for the functions recited in limitations 1[b][i]–1[b][ii].

Instructing and Obtaining Limitations

Limitations	Structure and Function
<p>13[b] “means for instructing the selected one or more terminals to measure signals from the second wireless access network”</p> <p>Limitations 1[a][ii], 11[d][ii], 15[c][ii].</p>	<p><u>Function</u>: instruct the selected one or more terminals to measure signals from the second wireless access network</p> <p><u>Structure</u>: interface of the first wireless access network that instructs the selected one or more terminals to measure signals from the second wireless access network</p>
<p>13[c] “means for obtaining measurement information . . . selected one or more terminals”</p> <p>Limitations 1[a][iii], 11[d][iii], 15[c][iii]</p>	<p><u>Function</u>: obtain measurement information indicative of the signals measured from the second wireless access network by the selected one or more terminals</p> <p><u>Structure</u>: interface of the first wireless access network over which measurement information indicative of the signals measured from the second wireless access network by the selected one or more terminals are received</p>
<p>[3] “information collector is further configured to obtain location information . . . one or more terminals”</p>	<p><u>Function</u>: obtain location information for at least one of the at least part of the plurality of terminals prior to selecting the one or more terminals</p> <p><u>Structure</u>: interface of the first wireless access network over which location information for at least one of the at least part of the plurality of terminals is received</p>

Pet. 18–19. Petitioner asserts that the ’089 patent “consistently describes the generic information collector as communicating with terminals over the first wireless access network to instruct and obtain measurement information that the terminals collect from the second wireless access network.” *Id.* at 19–20 (citing Ex. 1001, 2:25–36, 7:10–17, 9:16–19, 9:20–39). Petitioner further states that “[a]n interface of the first wireless access network performs the information collector’s instructing and obtaining functionality.” *Id.* at 20 (citing Ex. 1003 ¶ 79; Ex. 1001, 4:14–59, 6:1–3, 7:10–17, 7:59–61, 8:7–25, 8:65–9:19, Fig. 3).

Providing and Obtaining Limitations

Limitations	Structure and Function
13[d] “means for providing the measurement information to a coverage estimator” Limitations 1[a][iv], 11[d][iv], 15[c][iv].	<u>Function</u> : provide the measurement information to the [coverage estimator/network node] <u>Structure</u> : interface to the communication link that carries information to the [coverage estimator/ network node]
4[b] “information collector is further configured to . . . provide the location information . . . to the coverage estimator.”	<u>Function</u> : provide the location information associated with the at least one of the selected one or more terminals to the coverage estimator <u>Structure</u> : interface to the communication link that carries the location information associated with the at least one of the selected one or more terminals to the coverage estimator
[5] “information collector is further configured to provide location information valid upon	<u>Function</u> : provide location information valid upon obtaining the measurement information for at

obtaining . . . one or more terminals.”	least one of the selected one or more terminals <u>Structure</u> : interface to the communication link that carries location information valid upon obtaining the measurement information for at least one of the selected one or more terminals
15[a] “means for obtaining measurement information from an information collector” Limitations 1[b][i], 11[f][i].	<u>Function</u> : obtain measurement information from the information collector <u>Structure</u> : interface to the communication link that carries measurement information from the information collector

Pet. 20–21. Petitioner asserts that “[a]n interface to the communication link that carries information performs the claimed providing and obtaining functions.” *Id.* at 21 (citing Ex. 1003 ¶ 80; Ex. 1001, 6:56–7:9, 7:23–28, 9:1–39, Fig. 3 (depicting generic communication link between information collector 7 and coverage estimator 8)).

Claim 11 Means-Plus-Function Terms

Limitations	Structure and Function
11[a] “means for measuring signals from the second wireless access network”	<u>Function</u> : measuring signals from the second wireless access network <u>Structure</u> : radio receiver of terminal 5 that measures signals from the second wireless access network
11[b] “means for providing . . . measured signals”	<u>Function</u> : providing the measurement information to at least one of an information collector or a coverage estimator based on the measured signals

	<u>Structure</u> : interface of terminal 5 to the first wireless access network over which measurement information based on the measured signals are sent
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Pet. 21–22. Petitioner asserts that the ’089 patent “identifies only terminal 5 with no internal components disclosed other than a radio terminal.” *Id.* at 22 (citing Ex. 1001, 4:20–25, 6:39–44, 7:55–59, 7:65–67). Petitioner also argues that “[t]erminal 5 is therefore a radio terminal, and a radio receiver of terminal 5 performs the claimed measuring functionality.” *Id.* (citing Ex. 1003 ¶ 82; Ex. 1015, 8). According to Petitioner, the “[i]nterface of terminal 5 to the first wireless access network therefore performs the claimed providing functionality.” *Id.* (citing Ex. 1003 ¶ 82; Ex. 1001, 2:25–36, 6:1–12, 9:1–19, Fig. 3).

In our Institution Decision we found that Petitioner had set forth an adequate identification of the functions performed by the alleged means-plus-function elements as well as sufficient structure in the specification for purposes of institution. Inst. Dec. 22. Following our Institution Decision, neither party disputed or provided further argument on our determinations. PO Resp. 12–21; Pet. Reply 1–5; PO Sur-reply 5–11; *see also* Tr. 22:20–23:6, 25:24–26:1. We continue to find that these determinations are appropriate and apply them for purposes of this Decision.⁴

⁴ We have considered the district court’s claim construction order filed on March 16, 2022, which considers the construction of the terms “information collector” and “coverage estimator.” *See* Ex. 1027 (district court claim construction order). Although the district court similarly found the terms to be governed by § 112 ¶ 6, certain of the district court’s identifications of structure and function differ (or at least use different language) from those we have adopted here. *Id.* at 27–46. For example, the district court defined

4. “*Information Collector*”

In its Preliminary Response, Patent Owner argued that the term “information collector” must be construed to be “a *distinct entity* from the ‘terminals’” and “must be configured to perform all four of the following actions: ‘select one or more terminals,’ ‘instruct the selected one or more terminals,’ ‘obtain measurement information . . . measured . . . by the selected one or more terminals,’ and ‘provide the measurement information to the coverage estimator.’” Prelim. Resp. 17–18 (alterations in original).

In our Institution Decision, we agreed with Patent Owner that the plain language of claim 1 expressly requires the “information collector” to perform the four actions identified by Patent Owner. Inst. Dec. 16 (citing Ex. 1001, 11:53–66). We also preliminarily determined that the claims recite an “information collector” that is distinct from the “terminals,” but did not require that it be a “distinct entity.” *Id.* (citing Ex. 1001, 11:49–50 (reciting “a plurality of terminals”), 11:51 (reciting “an information collector”), 11:53–54 (reciting that the “information collector” is configured to “select one or more terminals”)).

In its Patent Owner Response, Patent Owner continues to argue that the “information collector” must be a “distinct entity” from the terminals and must perform the four actions identified above. PO Resp. 14–16.

In its Reply, Petitioner does not contest that the “information collector” performs these four functions, or that the “information collector”

the corresponding structure of the information collector’s “select[ing]” function as “information collector 7 having the features and configurations disclosed in the ’089 Patent; and equivalents.” Ex. 1027, 36. However, the identifications of structure and function proposed by Petitioner here are undisputed in this proceeding, and we find them to be appropriate, as discussed above.

is distinct from the terminals. Pet. Reply 3. However, Petitioner asserts that “importing ‘distinct entity’ into the claims, as [Patent Owner] proposes, is unnecessary, without basis, and injects ambiguity.” *Id.* (citing PO Resp. 15). According to Petitioner, “[n]either the claims nor the specification recite ‘distinct entity.’” *Id.*

Petitioner also argues that Patent Owner’s application of its construction appears to propose, in effect, that the “information collector” must be a “distinct network element” that is not met by “one or more components” of a network. Pet. Reply at 3–4. Petitioner disagrees with such a construction, arguing that the ’089 patent specification does not require that the information collector be a “distinct network element,” and in fact contradicts any such understanding by disclosing that “the ‘coverage assessment system’ of which the ‘information collector’ and ‘coverage estimator’ are a part may be decentralized.” *Id.* (citing Ex. 1001, 7:3–7). “Moreover,” Petitioner argues, “there is nothing precluding a ‘network’ from performing the role of the claimed ‘information collector’ as opposed to some distinct element within that network.” *Id.* at 4. Petitioner further asserts that claim 14 of the ’089 patent contradicts Patent Owner’s proposed construction by expressly reciting “that the coverage estimator and the § 112(6) limitations corresponding to the information collector reside in the *same* network node,” suggesting that such a limitation should not be required in independent claim 13 upon which claim 14 depends. *Id.* at 3.

We continue to agree with the construction in our Institution Decision that the “information collector” must perform the four actions identified by Patent Owner and recited in the claims: “select one or more terminals,” “instruct the selected one or more terminals,” “obtain measurement

information . . . measured . . . by the selected one or more terminals,” and “provide the measurement information to the coverage estimator.” Inst. Dec. 15–16 (alterations in original). We also maintain our construction that the “information collector” must be distinct from the “terminals.” *Id.* However, we disagree with the portion of Patent Owner’s construction requiring the “information collector” to be a “distinct entity.” Nothing in the claim language requires that the “information collector” be a “distinct entity” and, as Petitioner points out, dependent claim 14 suggests otherwise by adding a specific limitation that the “coverage estimator” be “included within the network node” that performs the functions of the information collector. Ex. 1001, 11:44–12:6, 14:25–50.

Patent Owner’s “distinct entity” requirement is also at odds with the ’089 patent specification’s disclosure that the “coverage assessment system” may “be decentralized by implementing coverage assessment functionality in other network elements.” Ex. 1001, 7:4–6. As Dr. Pachamanov testified, “decentralized” means “that certain functions can be performed by *different* elements.” Ex. 1034, 17:1–4 (emphasis added). The ’089 patent also describes the “information collector” as being “largely implemented as software executed by a processor and making use of memory” or being “implemented in hardware or in a combination of software and hardware,” indicating that the implementation of the “information collector” is flexible and can take many forms. Ex. 1001, 7:29–35. Additionally, the implementation in Figure 3 showing information collector 7 and coverage estimator 8 as separate boxes residing in different networks is described as “an example” according “to one embodiment of the present invention,” indicating that the invention is not limited to this embodiment. *Id.* at 7:10–

12. Consequently, we do not construe the claim language to require that the “information collector” is a “distinct entity.”

5. “*Coverage Estimator*”

Patent Owner argues that the claimed “coverage estimator” in element 1[b] “must be configured to ‘obtain measurement information from the information collector,’ where the information collector is of the type construed above, which is *distinct* from the *terminals*.” PO Resp. 16–17. Petitioner does not contest that the “coverage estimator” is configured to obtain measurement information from the information collector, or that the “coverage estimator” is distinct from the terminals. Pet. Reply 3–4. Consequently, we construe the claims to require that the “coverage estimator” obtain measurement information from the information collector and be distinct from the terminals.

6. *Dependent Claims 3, 4, and 5*

Claims 3–5 recite as follows:

3. The automatic coverage assessment system of claim 1, wherein the information collector is further configured to obtain location information for at least one of the at least part of the plurality of terminals prior to selecting the one or more terminals.

4. The automatic coverage assessment system of claim 3, wherein the information collector is further configured to associate the location information with at least one of the selected one or more terminals and provide the location information associated with the at least one of the selected one or more terminals to the coverage estimator.

5. The automatic coverage assessment system of claim 1, wherein the information collector is further configured to provide location information valid upon obtaining the measurement information for at least one of the selected one or more terminals.

Ex. 1001, 12:11–26.

Patent Owner argues that “the location information ‘prior to selecting the one or more terminals’ in Claim 3 (and its dependent Claim 4) must be different from the ‘location information valid upon obtaining the measurement information’ in Claim 5” because “Claim 5 is a separate dependent claim from Claim 3, which implies that it must relate to different subject matter.” PO Resp. 17–18. “Otherwise,” according to Patent Owner, claim 5 “would be duplicative and would contravene the general canon that no two claims in a patent should be interpreted as having the same scope.” *Id.* at 18. Patent Owner also argues that this understanding is consistent with the ’089 patent specification’s disclosure that “the location of the selected terminals when they actually perform the measurement may have changed compared to the initial location that was used when the respective terminal was selected to participate in the measurement.” *Id.* (citing Ex. 1001, 9:20–29). “Therefore,” Patent Owner contends, “the location information in Claims 3 and 4 must relate to location information ‘prior to selecting the one or more terminals,’ which is different from the location information in Claim 5, which must relate to location information ‘valid upon obtaining the measurement information.’” *Id.* (citing Ex. 2008 ¶ 46).

Petitioner disagrees, arguing that Patent Owner “fails to provide any basis in the specification or prosecution history for construing ‘location information’ differently across the different claims.” Pet. Reply 4. According to Petitioner, there is no basis to limit the claims to situations where “the UE changes location between selection and measurement,” and Patent Owner “reads out embodiments where it is the same ‘location

information’ because the UE did *not* change location between selection and measurement.” *Id.* at 4–5 (citing PO Resp. 18).

Based on the full trial record, we find that “location information” in claims 3–5 should be given its ordinary meaning of information indicating the location of a terminal, and does not require further construction for purposes of this Decision. For each of claims 3–5, the other language in the claim provides context on how the “location information” is obtained and used in that claim. For example, in claim 3, the surrounding claim language requires that the “location information” is obtained “prior to selecting the one or more terminals,” and claim 4 adds that this location information is “associate[d] . . . with” the selected terminal(s) and “provide[d] . . . to the coverage estimator.” Ex. 1001, 12:11–21. Claim 5 is not dependent on claims 3 or 4, and the surrounding claim language states that the “location information” provided by the information collector is “valid upon obtaining the measurement information” for the terminal(s)—indicating that the location information is valid at the time the measurement information is obtained. *Id.* at 12:22–26; *see id.* at 9:20–29. Therefore, we agree with Patent Owner that claims 3 and 4 require that the “location information” is obtained “prior to selecting the one or more terminals,” and claim 5 requires that the location information is “valid upon obtaining the measurement information,” but disagree that this requires any specialized construction of the term “location information” beyond its ordinary meaning.

7. *Other Terms*

We determine that it is not necessary to provide an express interpretation of any other claim terms to resolve the issues presented in this proceeding. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*,

868 F.3d 1013, 1017 (Fed. Cir. 2017); *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

B. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103(a) if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, objective evidence of non-obviousness.⁵ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). When evaluating a combination of teachings, we must also “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Whether a combination of prior art elements would have produced a predictable result weighs in the ultimate determination of obviousness. *Id.* at 416–417.

In an *inter partes* review, the petitioner must show with particularity why each challenged claim is unpatentable. *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016); 37 C.F.R. § 42.104(b) (2020). The burden of persuasion never shifts to Patent Owner. *Dynamic*

⁵ Patent Owner has not presented objective evidence of non-obviousness.

Drinkware, LLC v. Nat'l Graphics, Inc., 800 F.3d 1375, 1378 (Fed. Cir. 2015).

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

C. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art at the time of the alleged invention “would be a person with a B.S. degree in electrical engineering, computer engineering, or equivalent training or job experience, with at least one to two years of experience in wireless communication technology, or a Master’s degree in electrical engineering, computer engineering, or other equivalent degree.” Pet. 11 (citing Ex. 1003 ¶ 65). Petitioner further states that “[a]dditional education could compensate for less practical experience and vice versa.” *Id.* Patent Owner does not propose a level of ordinary skill in the art. *See* PO Resp.

For purposes of this Decision, we adopt Petitioner’s assessment of the level of ordinary skill in the art because we find it to be supported by the ’089 patent and the asserted prior art.

D. Ground 1: Asserted Obviousness of Claims 1–5, 11, and 13–15 Based on Olofsson in view of Kuruvilla

Petitioner contends that claims 1–5, 11, and 13–15 would have been obvious over Olofsson in view of Kuruvilla. Pet. 22–91. Patent Owner disagrees, arguing that Petitioner has failed to establish that the prior art teaches or suggests various elements of the claims. PO Resp. 21–48.

1. Overview of Olofsson (Ex. 1006)

Olofsson is directed to a system for “triggering of a user equipment to perform test or measurement of a target network from an originating

network.” Ex. 1006, code (57). Olofsson explains that field tests of cellular networks typically “are accomplished with drive tests wherein an RF or cellular engineer drives a vehicle around in a designated area while making one or more telephone calls using his mobile cellular telephone.” *Id.* at 3:19–22. However, Olofsson explains, drive tests are “an extremely inefficient exercise, in terms of time, for an RF engineer.” *Id.* at 4:10–12. Olofsson also explains that “[p]rior to open[ing] a communications system for public use and commercial services, most providers or operators would like to estimate their service quality and radio coverage provided.” *Id.* at 5:2–4. Thus, according to Olofsson, “it would be of a great value to a wireless services provider, and in the end also to users of the services, if user equipment in public use could provide measurement data” for new networks using developing technology so that “coverage and service quality can be ensured prior to the new technology [being] made available for public services.” *Id.* at 5:14–17.

To address this perceived need, Olofsson discloses a system including an originating network open for public use, a target network not yet open for public use, and user equipment devices (UEs) connected to the originating network that may be controlled to assist in testing of neighboring cells of the target network. Ex. 1006, 8:21–26. In Olofsson’s system, an originating cell of the originating network informs selected UEs to measure a target cell. *Id.* at 9:9–12. In a densely populated area, the originating network preferably selects a subset of the available UEs to participate in the measurement. *Id.* at 10:20–22. The selection process can also consider the UE’s capability for performing and reporting measurements and the UE’s location. *Id.* at 10:3–6, 10.

The network signaling to the UE preferably includes information on what signals or parameters to measure or determine, and can include measurements for determining service quality and radio coverage. Ex. 1006, 12:24–27. UEs participating in the test measure signals of the new cell and send a report on the outcome of the measurement. *Id.* at 9:21–23. Olofsson discloses that measurement reports are preferably transmitted to a test evaluation server (TES) in the target cell. *Id.* at 14:18–21. However, Olofsson explains, measurement reports may also be transmitted to the originating cell, although doing so will require additional network signaling and communications that may drain the batteries of the UE. *Id.* at 14:23–26.

2. *Overview of Kuruvilla (Ex. 1007)*

Kuruvilla is directed to a system for identifying geographical areas where radio frequency coverage is poor. Ex. 1007, code (57). Kuruvilla explains that one “method of measuring RF coverage is to perform a drive test,” but that this approach is “insufficient” because it requires technicians to physically visit multiple areas, it cannot achieve full coverage, and it does not reflect changing RF coverage due to construction and seasonal foliage. *Id.* ¶ 5. To overcome this problem, Kuruvilla provides a communication network that uses mobile units to make measurements, an embodiment of which is shown in Figure 1, reproduced below.

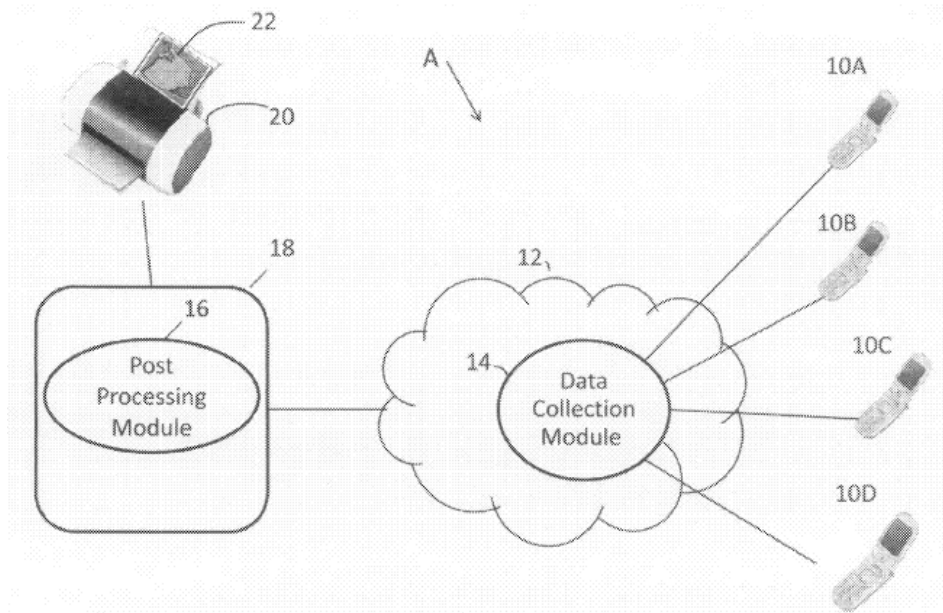


Figure 1

Figure 1 depicts Kuruvilla’s system for determining network coverage.
Ex. 1007, Fig. 1.

As shown in Figure 1, “communications infrastructure A includes a plurality of mobile units 10A, 10B, 10C, 10D,” that “are in communication with a network provider 12.” Ex. 1007 ¶¶ 32, 34. Network provider 12 “includes a data collection module 14.” *Id.* “The data collection module collects RF signal measurements and location information from multiple mobile phones in response to a trigger.” *Id.* ¶ 8. Data collection module 14 is “in communication with a post processing network element 18,” which includes “a post processing module” 16. *Id.* ¶¶ 32, 34. The “post processing module plots the RF coverage information on a map using data uploaded from the data collection module.” *Id.* ¶ 8. “A wireless provider may use this information in order to correct RF coverage problems.” *Id.*

3. *Motivation to Combine Olofsson With Kuruvilla*

Petitioner provides several reasons why one of ordinary skill would have been motivated to combine Olofsson with Kuruvilla to arrive at the claimed invention. Pet. 22–31. Relying on Dr. Kotzin, Petitioner argues

that Olofsson and Kuruvilla “are in the same field of endeavor” and “are directed to solving the same problem—evaluating coverage of a network in a more efficient manner than conventional drive tests by using measurement information from existing UEs.” *Id.* at 23 (citing Ex. 1003 ¶¶ 111, 133, 160, 187, 215, 236, 252, 274; Ex. 1006, 5:14–6:9, 8:25–9:4; Ex. 1007 ¶¶ 5–6). Petitioner also asserts that both systems “are very similar,” and “evaluate coverage by instructing and leveraging existing UEs to obtain signal information from neighboring networks.” *Id.* (citing Ex. 1003 ¶¶ 112, 131, 161, 188, 216, 237, 253, 275; Ex. 1006, 9:8–14, 10:11–17, Fig. 1; Ex. 1007 ¶¶ 8, 34, 36, 45, 48, 50, 53, 56, Fig. 3). Petitioner further argues that “both are directed to evaluating network coverage using improved techniques over conventional drive tests.” *Id.* at 24 (citing Ex. 1003 ¶¶ 113, 135, 162, 189, 217, 238, 254, 276; Ex. 1006, 3:13–4:15, 5:14–6:9, 8:25–9:4; Ex. 1007 ¶¶ 5–6).

As for the implementation details, Petitioner argues that one of ordinary skill “would have been motivated to combine Olofsson’s system involving two wireless access networks with Kuruvilla’s data collection module and post processing module.” Pet. 24 (citing Ex. 1003 ¶¶ 111–119, 133–140, 160–176, 186–204, 214–223, 236–244, 252–259, 274–280). According to Petitioner, Olofsson “teaches selecting and instructing UEs to take measurements, and transmitting the measurement information to the entity responsible for evaluating measurements, the test evaluation server (TES).” *Id.* Petitioner also argues that Olofsson teaches “the UE providing its location information to the TES in the measurement report” and “evaluating the measurement information obtained by the UEs.” *Id.* (citing Ex. 1006, 14:6–17, 14:19–21, claim 4). According to Petitioner, one of

ordinary skill considering Olofsson “would have been motivated to look to similar references, such as Kuruvilla for implementation details of the data collection module component instructing and obtaining measurement and location information from the UEs and transmitting it to the entity responsible for evaluating the measurements,” as well as “the implementation details of the coverage estimator evaluating the measurement information to generate a coverage assessment, such as a coverage map.” *Id.* at 24–25 (citing Ex. 1003 ¶¶ 114, 136, 163, 190, 218, 239; Ex. 1006, 5:14–17, 5:22–6:3, 6:10–13, 7:19–21).

Petitioner further argues that one of ordinary skill would have had a reasonable expectation of success in combining Olofsson and Kuruvilla, and would have been further motivated to make the combination because it would achieve the benefit of improving coverage while avoiding the problems with drive tests. Pet. 26–31.

We find that Petitioner has presented sufficient evidence that one of ordinary skill would have been motivated to combine Olofsson and Kuruvilla as Petitioner proposes. Patent Owner argues that there would have been no motivation to combine Olofsson and Kuruvilla to achieve several of the claim limitations, including the preamble, the “information collector,” and the “coverage estimator,” which are discussed in the sections of Patent Owner’s Response presenting argument on those limitations. *See* PO Resp. 25, 35–37, 39–40. We will discuss Patent Owner’s motivation to combine arguments in the sections addressing these limitations below.

4. *Analysis of Independent Claim 1*

- a) *1[preamble]: “[a]n automatic coverage assessment system configured for generating a coverage assessment for a second wireless access network of a telecommunications infrastructure comprising a first wireless access network and the second wireless access network, the first and second wireless access networks capable of providing services to a plurality of terminals”*

Petitioner asserts that, to the extent the preamble of claim 1 is limiting, the Olofsson-Kuruvilla combination discloses it. Pet. 31–34. Petitioner argues that Olofsson “discloses an originating network (first wireless access network) and a target network (second wireless access network) providing telecommunication services.” *Id.* at 31 (citing Ex. 1006, code (57), 8:18–20). Petitioner contends that “[t]he first and second networks are capable of providing service to a plurality of terminals.” *Id.* at 31–32 (citing Ex. 1006, 7:14–19, 8:1–9, 9:1–4). Petitioner also argues that Olofsson discloses an automatic coverage assessment system configured for generating a coverage assessment of the second wireless network in which UEs provide measurement data to allow for evaluation of coverage and service quality. *Id.* at 32 (citing Ex. 1006, 5:14–17, 5:22–6:3, 6:10–13). Petitioner argues that Kuruvilla also discloses an automatic coverage assessment system configured for generating a coverage assessment. *Id.* at 33.

Patent Owner disagrees, relying on its claim construction that the preambles “require a system, mobile user terminal, or network node for a telecommunications infrastructure comprising first and second wireless access networks, which are both *operational* and capable of providing services to a plurality of terminals.” PO Resp. 21–22 (emphasis added). Patent Owner argues that, “even though Olofsson discloses the interactions

of two communications systems (defined as ‘originating’ and ‘target’ networks) to perform measurements on the ‘target network,’ the Olofsson system is dedicated to conducting ‘radio coverage or service quality measurements of **a system not yet open for public use**’ (the ‘target network’) ‘while providing services of another system, such as a legacy system’ (the ‘originating network’).” *Id.* at 22 (citing Ex. 1006, 5:23–25; Ex. 2008 ¶ 55). Patent Owner also asserts that Olofsson distinguishes its invention from the prior art, which “focuses on a single [system] for communications and measurements and **also requires that this system is made available for communications.**” *Id.* (citing Ex. 1006, 4:19–21; Ex. 2008 ¶ 56). In other words, according to Patent Owner, even though Olofsson’s target network is “providing radio coverage for the respective radio access technology,” it “is not yet allowing service to mobile terminals that could be connected to the ‘originating network,’ because the ‘target network’ is not open for public use, and is not ‘made available for communications.’” *Id.* at 22–23. “[T]herefore,” Patent Owner contends, “no subscriber module terminals can be associated with [the target network], unless they are dedicated, ‘test’ terminals.” *Id.* at 23.

Patent Owner also argues that one of ordinary skill would not have been motivated to combine Olofsson and Kuruvilla because “Olofsson explicitly differentiates itself from the prior art by stating that all known prior art references require that the wireless networks which are being assessed are required to be made available for communications,” and “Kuruvilla is one such prior art system, where the wireless network provides services and is open for public use.” PO Resp. 25 (citing Ex. 1006, 4:19–21; Ex. 1007 ¶ 8; Ex. 2008 ¶ 64). According to Patent Owner, “Olofsson

explicitly explains that *not* requiring both the networks to be available for communications is what distinguishes Olofsson’s system from prior art.” *Id.* (citing Ex. 1006, 4:19–21; Ex. 1007 ¶ 8; Ex. 2008 ¶ 65).

Petitioner responds that Patent Owner “improperly reads out ‘capable of’ from the preamble’s recited ‘capable of providing services,’ and instead imports a requirement that the network ‘actually provide’ commercial—as opposed to test—services to UEs.” Pet. Reply 7 (citing PO Resp. 24). Petitioner asserts that Patent Owner’s expert admitted that one of ordinary skill “would have understood that networks may be ‘capable of providing’ service but not ‘actually providing’ commercial service at a given time; for example, if the network temporarily is congested, or tuning or configuration has not yet been completed.” *Id.* (citing Ex. 1034, 38:3–39:2; Ex. 1036 ¶ 19). Petitioner also disagrees with Patent Owner’s argument regarding “test” terminals, arguing that “the ’089 [p]atent claims broadly recite ‘terminals’ without excluding ‘test’ terminals,” and that Olofsson “does not describe its UEs as ‘test’ terminals” in any event.” *Id.*

Petitioner also argues that Patent Owner “ignores that Olofsson gives examples of systems ‘not available for public usage’ that align with the ’089 [p]atent’s disclosed embodiments of the second network,” such as “newly deployed systems using a new radio access technology.” Pet. Reply 6 (emphasis omitted) (citing Ex. 1006, 5:22–24, 7:19–25). Petitioner argues that this disclosure is consistent with the ’089 patent’s disclosure of LTE, which was a newly deployed system at the time of the alleged invention. *Id.* (citing Ex. 1001, 6:51–55, 7:61; Ex. 1034, 12:10–12; Ex. 1036 ¶ 18).

With respect to motivation to combine, Petitioner argues that Patent Owner “mischaracterizes Olofsson’s point of novelty as a target network not

available for public use.” Pet. Reply 8–9. To the contrary, according to Petitioner, “Olofsson distinguishes prior art based on the broader concept of measuring the target network to evaluate coverage,” and nothing in the prior art “limits or discourages application of Kuruvilla’s coverage assessment system to emerging or nonpublic networks.” *Id.* at 9 (citing Ex. 1006, 4:22–25; Ex. 1034, 59:8–20).

Based on the full trial record, we find that Petitioner has made a sufficient showing that the preamble would have been obvious to one of ordinary skill based on the Olofsson-Kuruvilla combination, and disagree with Patent Owner’s arguments to the contrary. First, Patent Owner relies on its construction of the language in the preamble to require that the first and second networks must be “operational” in addition to being “capable of providing services.” However, as discussed above, we have rejected that construction. *See* § II.A.2, *supra*. Similarly, we disagree with Patent Owner’s assertion that the claim language does not cover the use of “test” terminals or networks that are not “open for public use,” because nothing in the claim language excludes the use of “test” terminals or limits the network to one that is open for public use as opposed to a network that may be undergoing testing or otherwise not yet accessible by the general public.

We also agree with Petitioner that Olofsson provides examples of networks that are “capable of providing services” even if they are not yet available to the public. Olofsson describes “example embodiments of the invention to perform radio coverage or *service quality measurements* of a system not yet open for public use,” indicating that the system is capable of providing services even if those services have not yet been made available to the public. Ex. 1006, 5:22–24 (emphasis added); *see id.* at 7:9–13 (the

system may be used for “provid[ing] data necessary for establishing reliable operations and *a reliable service quality level* when the communication system is made available for public use”). Additionally, Olofsson discloses “non-exclusive examples” of such systems that would be capable of providing services:

Non-exclusive examples of such systems not available for public usage are newly deployed systems using a new radio access technology, systems, possibly of a same radio technology, providing new frequency bands or adding radio carriers not earlier supported to an existing network, and systems where part of the network previously available for public usage is (temporarily) brought into a state of operation preventing public usage, e.g. for the purpose of tuning or reconfiguration.

Ex. 1006, 7:19–25. Indeed, Olofsson’s example of “newly deployed systems” is similar to the ’089 patent’s disclosure of a second wireless access coverage with “no or poor radio coverage” such as an LTE network “at the beginning of the LTE deployment.” Ex. 1001, 7:58–65. Olofsson further discloses the use of “dual-mode” UEs “capable of operating on more than one radio access technology” which measure from the target network in active mode using a dedicated channel. Ex. 1006, 8:4–9, 10:14–11:7. We agree with and find credible Dr. Kotzin’s testimony that one of ordinary skill would have understood that these disclosures indicate that the target network was “capable of providing services” to the UE. Ex. 1036 ¶ 21.

Finally, we disagree with Patent Owner’s argument that one of ordinary skill would not have been motivated to combine Olofsson and Kuruvilla because Kuruvilla uses wireless networks that are available for public use, and Olofsson distinguishes its invention from such networks. PO Resp. 25. For this argument, Patent Owner relies on Olofsson’s statement

that “[c]ited prior art technology for estimating radio coverage focuses on a single [system] for communications and measurements and also requires that this system is made available for communications.” *Id.*; Ex. 1006, 4:19–21. From this, Patent Owner appears to suggest that whether the system is made available for communications by the public is the key distinction over the prior art. PO Resp. 25. Patent Owner, however, ignores Olofsson’s statements explaining the purpose of the invention as providing an improvement over “extremely inefficient” drive-tests for confirming and testing system performance, by using a first network to provide signaling to UEs which will then record measurement data for a second network. Ex. 1006, 4:10–15, 4:22–25, 7:9–13, 8:1–4. Thus, we disagree with Patent Owner that Olofsson’s key distinction over the prior art is whether the second network is available for use by the public. Moreover, although Olofsson discloses embodiments that involve a second network not yet available for public use, we do not see anything in Olofsson that would discourage one of ordinary skill from applying its teachings to a network that is open for use by the public, since doing so would also eliminate the “extremely inefficient” drive-tests that Olofsson is directed to avoiding.

We also disagree with Patent Owner’s argument that one of ordinary skill would not have combined Olofsson with Kuruvilla’s public network. Petitioner relies on Kuruvilla for implementation details of Olofsson’s data collection module component as well as Olofsson’s coverage estimator, not for the details of the second wireless network itself. Pet. 24–25, 33–34. We find that Olofsson’s use of its invention for testing a non-public second wireless network would not discourage one of ordinary skill from looking to Kuruvilla for the implementation details of the data collection module and

coverage estimator, because those details would be relevant regardless of whether the network is open to the public or not.

Consequently, based on the full trial record, we find that the preamble would have been obvious over the Olofsson-Kuruvilla combination.⁶

b) 1[a]: “an information collector;”

1[a][i]: “wherein the information collector is configured to:
(i) select one or more terminals from at least part of the plurality of the terminals capable of communicating with both the first wireless network and the second wireless network;”

1[a][ii]: “(ii) instruct the selected one or more terminals to measure signals from the second wireless access network;”

1[a][iii]: “(iii) obtain measurement information indicative of the signals measured from the second wireless access network by the selected one or more terminals; and”

1[a][iv]: “(iv) provide the measurement information to the coverage estimator”

Petitioner argues that the combination of Olofsson and Kuruvilla teaches these limitations. Pet. 34–59. With respect to limitation 1[a][i], Petitioner argues that “Olofsson discloses ‘select[ing] at least or more terminals from at least part of the plurality of the terminals.’” *Id.* at 34–35 (citing Ex. 1006, Fig. 1). Petitioner also asserts that these terminals are selected from “the at least part of the plurality of terminals capable of communicating with both the first wireless access network and the second wireless access network.” *Id.* at 35. According to Petitioner, Olofsson’s

⁶ As noted above, because we are persuaded that Petitioner has shown that the prior art teaches the subject matter recited in the preamble, we need not decide whether the preamble is limiting for purposes of this Decision. *See* § II.A.2, *supra*.

originating network is the claimed “first wireless access network” and Olofsson’s target network is the claimed “second wireless access network,” and Olofsson discloses terminals capable of communicating with both networks. *Id.* at 35–37 (citing Ex. 1006, 8:18–20, 9:1–4, 9:9–12, 16:11–17:4).

Petitioner also argues that in the Olofsson-Kuruvilla combination this selection is performed by an “information collector.” Pet. 38–40. According to Petitioner, one of ordinary skill “would have understood that one or more components of Olofsson’s originating network performs the claimed selecting step.” *Id.* at 38 (citing Ex. 1006, 9:9–12, Fig. 1; Ex. 1003 ¶ 129). Petitioner also argues that Kuruvilla discloses an “information collector” in the form of data collection module 14, which “collects RF signal measurements and location information from multiple mobile phones” and “is a component of the network.” *Id.* (citing Ex. 1007 ¶¶ 8, 20, 34, 36, Fig. 1). Petitioner contends that one of ordinary skill “would have been motivated to modify one or more components of Olofsson’s originating network to include Kuruvilla’s data collection module” for the reasons discussed above in the section addressing motivation to combine. *See* § II.E.3, *supra*. Petitioner further contends that the combination teaches the corresponding structure for the functions performed by this limitation, specifically a processor implementing an algorithm to perform the claimed selecting function, or equivalents thereof. Pet. 39–40 (citing Ex. 1006, 9:8–9, 18:6–7, 18:23–17; Ex. 1007 ¶ 8; Ex. 1003 ¶ 132).

With respect to limitation 1[a][ii], Petitioner argues that Olofsson “discloses ‘instruct[ing] the selected one or more terminals to measure signals from the second wireless access network.’” Pet. 40 (alteration in

original). Specifically, Petitioner argues that Olofsson “discloses ‘inform[ing] . . . selected UEs . . . to measure on a target cell [second wireless access network],’ where ‘[o]ne required selection criteria is [for] UEs to support the radio access technology . . . of the target network.’” *Id.* (citing Ex. 1006, 9:8–14, Fig. 1 (step 12)) (alterations in original).

According to Petitioner, these “instructions instruct the UEs to measure received signals of the second wireless access network” in order “to determine service quality and radio coverage.” *Id.* at 41–42 (citing Ex. 1006, 10:7–10, 12:12–15, 12:24–13:10). Petitioner further argues that the Olofsson-Kuruvilla combination teaches the corresponding structure for the functions performed by this limitation (or equivalent structure), specifically “one or more components of the originating network (information collector)” that “instruct the terminals via an interface of the first wireless access network.” *Id.* at 42–43 (citing Ex. 1006, 2:8–10, 9:21–23, 14:1–3; Ex. 1003 ¶ 146).

With respect to limitation 1[a][iii], Petitioner argues that the Olofsson-Kuruvilla combination discloses “obtain[ing] measurement information indicative of the signals measured from the second wireless access network by the selected one or more terminals.” Pet. 43–55. Specifically, Petitioner argues that Olofsson discloses that UEs should measure signals of the target cell (second wireless access network) based on signaled instructions from the originating network. *Id.* at 43–44 (citing Ex. 1006, 14:1–3, Fig. 1). Petitioner also asserts that Olofsson discloses that “[t]he selected UEs perform and report such signal measurements of the target network.” *Id.* at 44–45 (citing Ex. 1006, 9:8–14, 9:16–18, 10:3–6, 10:11–17, Fig. 1). Petitioner further argues that Kuruvilla’s “data collection module

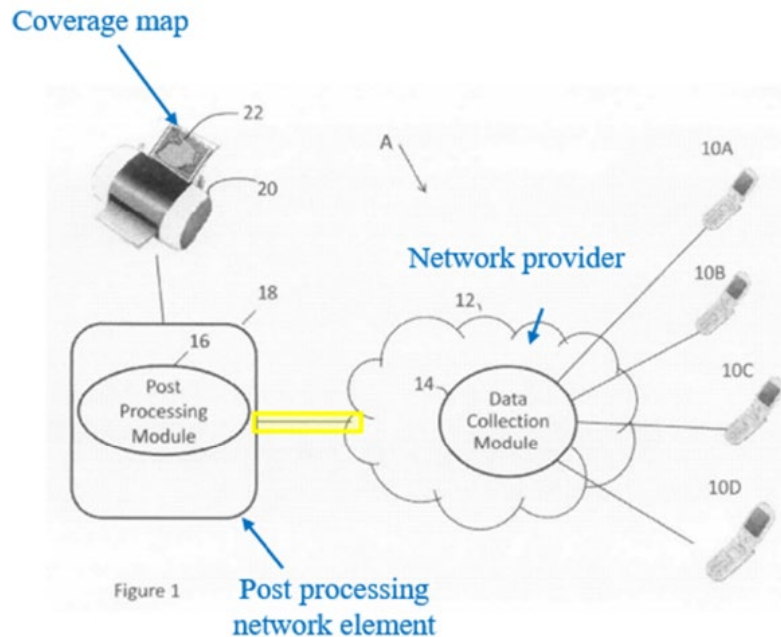
[information collector] collects RF signal measurements.” *Id.* at 47–49 (citing Ex. 1007 ¶¶ 8, 34, 36, 48, 53, Fig. 3) (alteration in original).

Petitioner also argues that the Olofsson-Kuruvilla combination teaches the corresponding structure for the functions performed by this limitation, specifically an “information collector” that is “configured to perform the claimed obtaining functionality.” Pet. 49. Petitioner argues that, in Olofsson’s system, “the UE can send the measurement report to the originating network,” and one of ordinary skill would have understood that “one or more components of Olofsson’s originating network selects the UEs and instructs the selected UEs to measure information from the target network.” *Id.* (citing Ex. 1006, 14:23–26; Ex. 1003 ¶ 157). In light of these disclosures, Petitioner asserts, one of ordinary skill would have found it obvious “for the one or more components of Olofsson’s originating network that selected and instructed the UEs to measure information (information collector) to also obtain the requested measurement information from those UEs.” *Id.* (citing Ex. 1003 ¶ 157). According to Petitioner, one of ordinary skill would have been motivated to modify Olofsson in this way because it would be efficient for “the component that instructed the UEs to take the measurements to also obtain the measurement reports from the UEs.” *Id.* at 50 (citing Ex. 1003 ¶ 158).

Petitioner also argues that one of ordinary skill “would have been motivated to combine Olofsson’s system with Kuruvilla’s data collection module obtaining the measurement information” such that “the UE transmits the measurement report to the data collection module or information collector of the originating network.” Pet. 50–51 (citing Ex. 1006, 14:18–15:3; Ex. 1003 ¶¶ 167, 194). Additionally, Petitioner contends, it would

have been obvious to combine Olofsson and Kuruvilla so that “Kuruvilla’s data collection module resid[es] in Olofsson’s target network,” and have the “UE transmit[] the measurement report to the data collection module or information collector residing in the target network.” *Id.* at 51 (citing Ex. 1006, 14:18–15:3, 12:6; Ex. 1003 ¶¶ 168, 196).

With respect to limitation 1[a][iv], Petitioner argues that the Olofsson-Kuruvilla combination “discloses ‘provid[ing] the measurement information to the coverage estimator.’” Pet. 56–59. Petitioner states that Olofsson “discloses providing the measurement information to the ‘entity being responsible for evaluating the measurements’” (Olofsson’s test evaluation server (TES)), but “does not expressly disclose an information collector configured to provide the measurement information to the coverage estimator.” *Id.* at 56 (citing Ex. 1006, 14:19–21; Ex. 1003 ¶ 181) (alteration in original). Petitioner argues that Kuruvilla discloses “providing the measurement information to the coverage estimator” as shown by post processing module 16. *Id.* at 56–57 (citing Ex. 1007 ¶¶ 31, 36, 56, Fig. 5 (step 505)). As for the corresponding structure for this element, Petitioner contends that Kuruvilla discloses a communication link between the data collection module and post processing module, highlighted in yellow in Petitioner’s annotated version of Kuruvilla’s Figure 1, reproduced below:



Petitioner’s annotated version of Kuruvilla’s Figure 1 with the communication link between data collection module 14 and post processing module 16 highlighted in yellow. Pet. 58 (citing Ex. 1007, Fig. 1, ¶ 34). Petitioner also argues that Olofsson “expressly discloses interfaces to the communications network infrastructure,” and one of ordinary skill “would have understood that the communication link between the information collector and coverage estimator similarly would comprise an interface for providing and obtaining information.” *Id.* at 59 (citing Ex. 1006, 2:8–10; Ex. 1003 ¶ 185).

Patent Owner argues that the Olofsson-Kuruvilla combination does not teach the claimed “information collector.” PO Resp. 26–37; PO Sur-reply 14–20. First, Patent Owner argues that “Olofsson generally discusses the ‘originating network’ as being responsible for implementing some of the required operations” (such as informing selected UEs to measure a target cell), “rather than disclosing a *distinct element* similar to the ’089 ‘information collector,’ which performs the steps of selecting terminals and instructing the selected terminals to measure signals.” PO

Resp. 26 (emphasis added) (citing Ex. 1006, 9:9–14; Ex. 2008 ¶ 68). According to Patent Owner, it is not clear from Olofsson “which network elements would perform the specific operations of its selection process or its signaling to the terminals,” and Olofsson “remains silent on any details regarding which network element would trigger and perform this selection.” *Id.* at 27 (citing Ex. 1006, 10:3–10, 12:12–18, 12:24–13:10, 20:22; Ex. 2008 ¶¶ 70–71). Additionally, Patent Owner contends that Olofsson’s disclosure that “as an alternative, the signaling [to the UEs] is transmitted from the target network” would have indicated to one of ordinary skill that the “instructing” step “would be performed by a *different* network element” which “could belong to the ‘target network.’” *Id.* (citing Ex. 1006, 12:4–6; Ex. 2008 ¶ 72). “Consequently,” Patent Owner argues, “Olofsson fails to disclose or suggest a *distinct network element* that performs at least the steps of (1) selecting terminals and (2) instructing them to perform measurements.” *Id.* at 27–28 (citing Ex. 2008 ¶ 73) (emphasis added); see PO Sur-reply 14–18.

Patent Owner further argues that Olofsson does not disclose or suggest “any *specific network element* such as an ‘information collector’ that would receive (‘obtain’) the measurement information and further ‘provide’ those to Olofsson’s TES in the target network.” PO Resp. 31 (emphasis added). “Instead,” Patent Owner asserts, “Olofsson simply teaches that the measurement reports can be transmitted to some generic network elements, *e.g.*, ‘transmitted to a base station,’ ‘the originating cell,’ or to [the] ‘receiving base station or base station controller’ in the target network.” *Id.* at 32 (citing Ex. 1006, 14:18–30).

Patent Owner also argues that claim 1 requires the “information collector” to obtain measurement information from the selected terminals and provide this information to the coverage estimator, but Olofsson “teaches a completely different implementation, where the *terminals* themselves should report the measurement information directly to a network entity that is responsible for evaluating the measurements — Olofsson’s test evaluation server, TES, which is in the target network.” PO Resp. 28–29. Therefore, according to Patent Owner, one of ordinary skill “would find no need to add another network device,” such as the “information collector,” for “obtaining the results of the measurements from the terminals and sending those to Olofsson’s test evaluation server, because it would be unnecessary and redundant.” *Id.* (citing Ex. 2008 ¶ 75); *see* PO Sur-reply 17–18.

Additionally, Patent Owner acknowledges that “Olofsson discloses the possibility that the terminals (UEs) may transmit the measurement reports to the originating cell instead of to a base station of the target network,” but argues that Olofsson “strongly advises against this” because it “would result in additional network signaling and communications relations between the originating and the target network, as well as increased power consumption of the UEs, resulting in draining their batteries faster.” PO Resp. 30 (citing Ex. 1006, 14:18–15:3); *see* PO Sur-reply 18. Thus, according to Patent Owner, one of ordinary skill “would not have considered implementing a system that sends the measurement reports from the terminals (UEs) back to the originating network, instead of sending those directly to the TES in the target network.” PO Resp. 31.

With respect to Petitioner’s reliance on Kuruvilla’s data collection module to obtain information from the terminals, Patent Owner argues that

“[n]othing in Kuruvilla suggests that the ‘data collection module’ is responsible for, and can be used to perform, a *selection* of terminals to perform measurements, or to instruct the terminals about the specific measurements that have to be performed.” PO Resp. 33–34 (citing Ex. 2008 ¶ 84). According to Patent Owner, Kuruvilla provides “no disclosure of a process related to ‘selection of terminals’ to perform measurements,” and “Kuruvilla’s process is entirely passive, awaiting events such as a dropped call occurring.” *Id.* at 34 (citing Ex. 1007 ¶¶ 42, 47; Ex. 2008 ¶ 85). Patent Owner further contends that Kuruvilla fails to disclose or suggest “a specific network component that implements the four functions of the ‘information collector’ element required by [c]laim 1 of the ’089 patent.” *Id.* at 34–35 (citing Ex. 1007 ¶¶ 34, 48); *see* PO Sur-reply 16, 19.

Finally, Patent Owner argues that there would have been no motivation to combine Olofsson and Kuruvilla to achieve the required “information collector.” PO Resp. 35–37; PO Sur-reply 20–21. Patent Owner asserts that “the functionality of Kuruvilla’s ‘data collection module’ 14 is redundant and unnecessary” in view of Olofsson’s disclosure that “the terminals (UEs) transmit the measurement reports direction to the TES,” which “should already implement some kind of data storage where all measurement reports are collected and further used for evaluation.” PO Resp. 36. Even in “Olofsson’s non-preferred scenario” where “the UEs send the measurement reports back to the originating network,” according to Patent Owner, the final destination of these reports “remains the TES in the target network,” and therefore “[i]t is unlikely that a person of ordinary skill in the art would consider storing these reports in the originating network, let alone storing them in the data storage of the same element that selected the

terminals to perform the measurements, or instructed them for the types of measurements that need to be performed.” *Id.* at 36–37 (citing Ex. 2008 ¶ 89); *see* PO Sur-reply 19–20.

Petitioner responds that “[i]n arguing Olofsson must disclose ‘a distinct element’ [Patent Owner] demands more from Olofsson than is recited in the claims, disclosed in the ’089’s specification, or even proposed in [Patent Owner’s] own construction.” Pet. Reply 10. According to Petitioner, Patent Owner’s argument “contradicts the ’089 patent’s disclosed decentralized implementations,” which implement functionality “on more than one component,” as well as its disclosure “that the ‘information collector’ may be implemented in a combination of software (executed on a processor) and hardware.” *Id.* at 11 (emphasis omitted) (citing Ex. 1001, 7:3–7, 7:29–35; Ex. 1034, 17:1–5). Petitioner also asserts that Patent Owner’s arguments criticize the references in isolation and ignore the combination that Petitioner proposes, in which “Kuruvilla’s data collection module obtains measurement information from the terminals” and “provides it to the post processing module or coverage estimator.” *Id.* at 13, 14 (citing Ex. 1007 ¶¶ 8, 40, 56, Fig 5). Similarly, according to Petitioner, Patent Owner’s argument that Kuruvilla does not perform selection improperly considers the references in isolation because Petitioner relies on Olofsson for selection. *Id.* at 15 (citing PO Resp. 32–35; Pet. 34–37).

With regard to motivation to combine, Petitioner responds to Patent Owner’s argument that Olofsson “strongly advises” against transmitting the measurement reports to the originating cell by noting that Olofsson expressly discloses that “[o]f course, transmission 14 of measurement reports is possible also in the originating cell.” Pet. Reply 17 (emphasis

omitted, alteration in original); PO Resp. 30–31. Petitioner also asserts that one of ordinary skill “would have recognized that the signaling and UE battery expense would not apply to the Olofsson-Kuruvilla combination,” because “the selected UEs are already in communication with both the originating and target networks and send the measurement report to a network via uplink signaling in either case, and in the combination the UE transmits to the information collector of either the originating or target network (depending on the embodiment), not both.” Pet. Reply 17–18 (citing Pet. 49–54; Ex. 1003 ¶¶ 157, 169–172, 197–200). Petitioner also argues that one of ordinary skill “would have understood the benefits of the entity responsible for evaluating measurements ultimately obtaining the measurements, as disclosed in Olofsson,” and “would have been motivated to look to similar references, such as Kuruvilla.” *Id.* at 18 (citing Ex. 1006, 14:19–20; Ex. 1003 ¶¶ 163, 190, 203–204). Finally, Petitioner contends that its combination “does not rely on the TES as the ‘information collector,’” and that “[t]he claims do not recite that the information collector must store measurements in the first network,” as Patent Owner argues. *Id.* (citing PO Resp. 36); *see* PO Sur-reply 20–21.

Based on the full trial record, we find that Petitioner has sufficiently proven that one of ordinary skill would have found the “information collector” elements (including the claimed functions and corresponding structure for those elements) to be obvious over the combination of Olofsson and Kuruvilla. With respect to limitations 1[a][i] and 1[a][ii], Petitioner has sufficiently shown that it would have been obvious to one of ordinary skill that components exist in Olofsson’s originating network that select terminals capable of communicating with the originating and target networks and

instruct those terminals to measure signals from the second wireless access network. Pet. 38 (citing Ex. 1006, 9:9–12, Fig. 1; Ex. 1003 ¶ 129); *id.* at 42–43 (citing Ex. 1006, 2:8–10, 9:21–23, 14:1–3; Ex. 1003 ¶ 146). For example, Olofsson discloses that “[o]riginating network informs (12), from an originating cell of the originating network, selected (11) UEs in the originating cell and also being within radio coverage of one or more neighboring cells of the target network, to measure on a target cell,” and that one required criteria for selection is that the selected UEs “support the radio access technology or mode of operation for measurements of the target network/target cell.” Ex. 1006, 9:9–14; *see id.* at 14:1–3 (explaining that UEs measure signals and parameters of the target cell “according to signaling instructions from [the] originating network.”). We also credit Dr. Kotzin’s testimony that one of ordinary skill would have understood that “one or more components of Olofsson’s originating network selects the UEs and instructs the selected UEs to measure information from the target network.” Ex. 1003 ¶ 157. We find that the components within the originating network that perform the selection and instruction of the terminals are distinct from the terminals themselves and can be considered part of an “information collector” under our construction of that term. *See* § II.D.A.3, *supra*.

With respect to limitation 1[a][iii], Petitioner has presented sufficient evidence that one of ordinary skill would have found it obvious for the terminals to report the measurement information back to the components within the originating network that selected and instructed the terminals. Olofsson discloses that the UE measures “signal and parameters of the target cell” and “report[s] the result of the measurements to a network entity being

responsible for evaluating the measurements,” which can be “in the originating cell.” Ex. 1006, 14:1–3, 14:18–26; *see* Ex. 1003 ¶¶ 153, 156. We also rely on and find credible Dr. Kotzin’s testimony that it would have been obvious to a person of ordinary skill for the UEs to transmit the signal measurements “to the one or more components of Olofsson’s originating network that instructed the UEs to take the measurements in the first place—the information collector” in order to “obtain the benefits and efficiencies of the component that instructed the UEs to take the measurements to also obtain the measurement reports from the UEs.” Ex. 1003 ¶¶ 157–158.

Kuruvilla also discloses a “data collection module” that “collects RF signal measurements” from “multiple mobile phones.” Ex. 1007 ¶¶ 8, 34, 36, 48, Figs. 1, 3. We agree with Petitioner’s arguments, as set forth in Section II.D.3 above, that one of ordinary skill would have found it obvious to modify Olofsson’s originating network to include Kuruvilla’s data collection module because it provides implementation details for a component that instructs and obtains measurement and location information from the UEs. *See* § II.D.3, *supra*; Pet. 22–31, 38–40, 47–52, 54–55; Ex. 1003 ¶¶ 114, 133–140, 163, 167, 190, 218, 239. We further agree with Petitioner that it would have been obvious to combine Olofsson and Kuruvilla so that Kuruvilla’s data collection module resides in Olofsson’s target network (along with the other components of the “information collector” that select and instruct the terminals), and receives measurements from the UE. Pet. 51. In this regard, Olofsson teaches that, as an alternative, signaling the UEs may be “transmitted from the target network,” and we credit Dr. Kotzin’s testimony that “the Olofsson-Kuruvilla combination also teaches the UE transmitting the measurement report to the

data collection module or information collector residing in the target network.” Ex. 1006, 12:6; Ex. 1003 ¶¶ 168, 196.

With respect to limitation 1[a][iv], we agree with Petitioner that Olofsson discloses providing the measurement information to the “entity being responsible for evaluating the measurements, but does not expressly disclose an information collector configured to provide the measurement information to a coverage estimator.” Pet. 56; Ex. 1003 ¶ 181. However, we find that Kuruvilla discloses providing the measurement information to a coverage estimator when it discloses that “data collection module 14 is used to collect data,” and “[t]he data received is forwarded to a post processing network element 18 which includes a post processing module 16,” which “is configured to record and store the data and organize into a report.” Ex. 1007 ¶¶ 36, 40; Pet. 56–59. Additionally, Petitioner has sufficiently shown that one of ordinary skill would have been motivated to combine Kuruvilla’s post processing module with Olofsson because having Kuruvilla’s post processing module obtain the measurement information and provide it to the coverage estimator would centralize this functionality at the network rather than the UE, thereby saving UE signaling and battery power. *See* Pet. 30–31; Ex. 1003 ¶¶ 118, 140, 176, 204, 223, 244, 259, 280.

We do not agree with Patent Owner’s arguments as to this claim element. First, we disagree with Patent Owner’s argument that Olofsson does not disclose “a *distinct element* similar to the ’089 ‘information collector,’ which performs the steps of selecting terminals and instructing the selected terminals to measure signals.” PO Resp. 26 (emphasis added). As explained above, we have construed the “information collector” to require that it be “distinct” from the terminals, but do not adopt Patent

Owner’s construction that there must be a “distinct entity” (or “distinct element”) that performs all four of the functions of the “information collector.” *See supra* § II.A.3. The portions of the Olofsson-Kuruvilla combination that Petitioner relies on for the “information collector,” discussed above, are distinct from the terminals (UEs) themselves, which is the only “distinctness” the claim requires. Patent Owner fails to present persuasive evidence to the contrary. For similar reasons, we do not agree with Patent Owner’s argument that “Olofsson . . . does not disclose or suggest any *specific network element* such as an ‘information collector’ that would receive (‘obtain’) the measurement information and further ‘provide’ those to Olofsson’s TES in the target network.” *See* PO Resp. 31–32 (emphasis added).

Second we disagree with Patent Owner’s argument that, because Olofsson teaches that “the *terminals* themselves should report the measurement directly to a network entity that is responsible for evaluating the measurements” (the test evaluation server (TES)), adding another network device (such as the “information collector” or Kuruvilla’s “data collection module”) for “obtaining the results of the measurements from the terminals and sending those to Olofsson’s test evaluation server” would be “unnecessary and redundant.” PO Resp. 28–29, 35–37. Although Olofsson’s preferred embodiment involves the UEs reporting measurements to the TES in the target network, Petitioner relies on Olofsson’s alternative embodiment in which the UE transmits measurements to “the originating cell.” Pet. 47, 49; Ex. 1006, 14:23–26; Ex. 1003 ¶¶ 153, 157. Olofsson also discloses having the UE send the measurements to an intermediate element, such as a receiving base station, instead of sending them directly to the TES.

Ex. 1006, 14:18–15:3 (“When measurement reports are transmitted to the target network, the receiving base station or base station controller will forward received information to the relevant TES.”); Ex. 1003 ¶ 173.

Additionally, we rely on and find credible Dr. Kotzin’s testimony that it would have been obvious to a person of ordinary skill “for the one or more components of Olofsson’s originating network that selected and instructed the UEs to measure information (information collector) to also obtain the requested measurement information from those UEs” in order to “obtain the benefits and efficiencies” of having the same component both instruct the UEs and obtain measurements from them, and that this configuration would not involve additional signaling or battery expense by the UE because “the selected UEs are in communication with both the originating and target networks.” Ex. 1003 ¶¶ 157–158, 172. In light of this evidence, we find that the Olofsson-Kuruvilla combination teaches multiple ways of having the UEs report measurement data back to the system, and that one of ordinary skill in the art would not consider it to be “unnecessary and redundant” for the “information collector” to both instruct the UEs and receive measurements from them.

Third, we disagree with Patent Owner’s argument that Kuruvilla does not teach that its data collection module performs the four functions recited for the “information collector,” including selecting and instructing terminals to perform measurements. PO Resp. 33–35. Petitioner does not rely on Kuruvilla for the “select[ing]” and “instruct[ing]” functions, or for the use of terminals connected to first and second networks, but instead relies on Olofsson for those limitations. Thus, Patent Owner’s argument considers Kuruvilla individually rather than addressing the Olofsson-Kuruvilla

combination relied on by Petitioner. One cannot defeat a showing of obviousness by merely attacking the references individually where, as here, the arguments are based on combinations of references. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

Fourth, we do not agree with Patent Owner's argument that one of ordinary skill "would not have considered implementing a system that sends the measurement reports from the terminals (UEs) back to the originating network" because Olofsson "strongly advises against this" due to the "additional network signaling and communications relations between the originating and the target network, as well as increased power consumption of the UEs, resulting in draining their batteries faster." PO Resp. 30–31 (citing Ex. 1006, 14:18–15:3). As noted above, Olofsson states that measurement reports are "preferably" transmitted to the base station of the target cell, but also explains that, "[o]f course transmission (14) of measurement reports is possible also in the originating cell." Ex. 1006, 14:18–26. Although Olofsson suggests that transmitting measurements to the originating network is not preferred because it involves "additional network signaling and communications relations, among other things draining batteries of battery powered UEs," we find that Olofsson here merely identifies this embodiment as non-preferred, and does not clearly discourage or teach away from transmitting measurements to the originating network. As the Federal Circuit has explained, "[a] statement that a particular combination is not a preferred embodiment does not teach away absent clear discouragement of that combination." *Syntex (U.S.A.) LLC v. Apotex, Inc.*, 407 F.3d 1371, 1380 (Fed. Cir. 2005). Moreover, we find credible Dr. Kotzin's testimony that one of ordinary skill would have seen a

benefit to having the same components that selected and instructed the UEs also obtain measurements from the UEs, and that “there would not be additional signaling or UE battery expense for the UE to send the measurement report to the information collector in the originating network, particularly since the selected UEs are in communication with both the originating and target networks.” Ex. 1003 ¶ 157.

Finally, we disagree with Patent Owner’s argument that one of ordinary skill would not have been motivated to combine Olofsson and Kuruvilla because, even where the UEs send measurements back to the originating network, the final destination of these reports “remains the TES in the target network,” and therefore “[i]t is unlikely that a person of ordinary skill in the art would consider storing these reports in the originating network, let alone storing them in the data storage of the same element that selected the terminals to perform the measurements, or instructed them for the types of measurements that need to be performed.” PO Resp. 36–37. As Petitioner correctly points out, its combination does not rely on Olofsson’s TES as the “information collector,” and the claims do not require that the information collector store measurements in the first network, as Patent Owner contends. Pet. Reply 18; Ex. 1001, 11:53–67.

For the foregoing reasons, and based on the full trial record, Petitioner has sufficiently proven that limitations 1[a][i]–1[a][iv] would have been obvious over the combination of Olofsson and Kuruvilla.

c) 1[b]: “a coverage estimator;”

1[b][i]: “wherein the coverage estimator is configured to:
(i) obtain measurement information from the
information collector, and”

1[b][ii]: “(ii) based on the obtained measurement
information, generate the coverage assessment for the
second wireless access network of the
telecommunications infrastructure;”

Petitioner argues that the combination of Olofsson and Kuruvilla teaches these limitations. Pet. 59–67. Petitioner asserts that Olofsson “discloses a coverage estimator as the ‘test evaluation server, TES,’ which is ‘a network entity being responsible for evaluating measurements.’” *Id.* at 61 (citing Ex. 1006, 14:19–21, 24:8–9). According to Petitioner, the TES “generates a coverage assessment” of the second wireless access network “by processing and evaluating UEs’ measurement reports (obtained measurement information) to determine service quality and radio coverage.” *Id.* at 63–64 (citing Ex. 1006, 4:22–5:18).

“Additionally,” Petitioner contends, “Kuruvilla discloses a coverage estimator as a post processing module,” that “is configured to receive the collected data and generate a report, such as coverage map 22.” Pet. 61–62 (citing Ex. 1007 ¶ 40, Fig. 1), 64–65. The report may be used “to ‘show[] coverage area network problems,’ and ‘determine geographic areas where signal strengths are poor.’” *Id.* at 65 (citing Ex. 1007 ¶ 50). Petitioner further argues that the Olofsson-Kuruvilla combination teaches “an interface to the communication link that carries measurement information from the information collector, or equivalents thereof.” *Id.* at 62.

In terms of corresponding structure, Petitioner argues that Olofsson discloses that the TES “comprises ‘processing circuitry’ for processing the

measurement reports,” and Kuruvilla “discloses that the post processing module is a ‘software module.’” Pet. 66 (citing Ex. 1006, 18:11–13; Ex. 1007 ¶¶ 8, 33).

Patent Owner argues that the Olofsson-Kuruvilla combination fails to teach the “coverage estimator.” PO Resp. 37–40; PO Sur-reply 21–23. Patent Owner asserts that “Olofsson teaches that the TES obtains the measurement reports from the *terminals* (UEs) themselves, rather than obtaining them from an *information collector* as required by this limitation of [c]laim 1,” and is “silent about the presence of a network component that would be responsible for collecting measurement reports from the selected UEs, and then sending those to the TES upon request.” PO Resp. 38. Patent Owner also contends that Kuruvilla’s data collection module is not equivalent to the “information collector” of claim 1. *Id.* at 39. Patent Owner further argues that one of ordinary skill would not have been motivated to combine Olofsson and Kuruvilla to achieve a coverage estimator configured to “obtain the measurement information from the information collector” because “Olofsson teaches that the UEs report the measurement information directly to the TES” which would make Kuruvilla’s data collection module “unnecessary and obsolete.” *Id.* at 39–40 (citing Ex. 1006, 14:18–21; Ex. 2008 ¶ 99).

Petitioner responds that “Olofsson discloses that the measurement information ultimately should be reported to the entity responsible for evaluating measurements, and Kuruvilla provides the implementation details for (1) the data collection module providing the information to the post processing module, and (2) the post processing module estimating coverage.” Pet. Reply 19–20. Petitioner also asserts that Kuruvilla’s data

collection module would not be “obsolete and unnecessary” in the combination because one of ordinary skill would have understood the benefits of having the same entity that instructed the UEs to take measurements also obtain the measurements and pass them to the entity responsible for evaluating them. *Id.* at 20–21 (citing Ex. 1003 ¶ 157).

Based on the full trial record, we find that Petitioner has made a sufficient showing that the Olofsson-Kuruvilla combination teaches the claimed “coverage estimator,” including the claimed functions and corresponding structure for this claim element. We do not agree with Patent Owner’s arguments, which largely retread ground covered in its arguments directed to the “information collector” claim limitations. Specifically, we disagree with Patent Owner’s argument that Olofsson’s TES obtains the measurement reports from the terminals instead of from an information collector because, as discussed in the previous section, Petitioner sufficiently shows that it would have been obvious in the Olofsson-Kuruvilla combination for the terminals to send their measurements back to a component in the originating network which would then forward them on to a “coverage estimator” (such as the TES or Kuruvilla’s post processing module). *See* § II.D.4(b), *supra*. Additionally, as also discussed in the previous section, Patent Owner’s argument that Kuruvilla’s data collection module does not perform all of the claimed functions of the “information collector” (such as the selecting and instructing steps) is flawed because Petitioner relies on Olofsson for those steps. *See id.* Finally, we find that Olofsson’s embodiment in which the UEs report measurements directly to the TES would not render Kuruvilla’s data collection module “unnecessary and obsolete” because, as discussed above, one of ordinary skill would have

understood that there would be benefits to having the same network entity instruct the UEs to take measurements, receive those measurements, and send them along to the entity responsible for evaluating them. *See id.*; Pet. Reply 20–21; Ex. 1003 ¶ 157.

For the foregoing reasons, and based on the complete trial record, Petitioner has sufficiently proven that limitations 1[b][i]–1[b][ii] would have been obvious over the combination of Olofsson and Kuruvilla.

d) Summary for Claim 1

For the foregoing reasons, and based on the full trial record, Petitioner has proven by a preponderance of the evidence that claim 1 is unpatentable over Olofsson and Kuruvilla.

5. Dependent Claim 2

Claim 2 depends from claim 1, and further recites that the system “comprises a trigger configured for triggering the information collector to select the one or more terminals.” Ex. 1001, 12:7–10. Petitioner argues that Olofsson “discloses triggering UEs to perform measurements of the target network,” but “does not expressly disclose a trigger configured for triggering the information collector to *select* the one or more terminals.” Pet. 67 (citing Ex. 1006, code (57), 20:6–8; Ex. 1003 ¶ 246). Petitioner argues that Kuruvilla discloses the use of a trigger for initiating the disclosed method and triggering the data collection module to collect the measured data from the UEs. *Id.* (citing Ex. 1007 ¶¶ 8–9, 41). Relying on Dr. Kotzin, Petitioner argues that it would have been obvious to one of ordinary skill to modify Kuruvilla’s trigger to be configured for triggering the information collector to select the one or more terminals. *Id.* at 69 (citing Ex. 1003 ¶¶ 250–251).

Patent Owner argues that “Olofsson discloses triggering UEs to perform *measurements* of the target network, but it is silent about anything that would trigger the process of *selection* of one or more terminals for measurements.” PO Resp. 40. Patent Owner acknowledges that “Kuruvilla does discuss triggers,” but asserts that “these triggers are not related to *selection* of terminals to perform measurements.” *Id.* at 41. “Instead,” according to Patent Owner, “in Kuruvilla, the start of measurements is ‘triggered’ by an event that occurs such as a dropped call, lost connection, or mobile terminal power increase,” and “[t]he trigger is an event which prompts a request for RF signal measurement.” *Id.* (citing Ex. 1007 ¶¶ 42, 47). “Consequently,” Patent Owner contends, Kuruvilla does not disclose or suggest “the step of ‘select[ing] one or more terminals from at least part of the plurality of terminals’ to perform measurements, but instead “passively reacts to events that occur and triggers measurements in response to those events.” *Id.* (citing Ex. 2008 ¶¶ 104, 107) (alteration in original). Thus, Patent Owner argues, one of ordinary skill “would not consider that Kuruvilla’s triggers should also start the process of *selection* of terminals to perform measurements.” *Id.* at 42 (citing Ex. 2008 ¶ 109). *See* PO Sur-reply 23–24.

In response, Petitioner argues that Patent Owner is considering the references in isolation, and in the combination it would have been obvious to one of ordinary skill “for the trigger to apply to selection” of terminals as well as for obtaining measurements by the terminals. Pet. Reply 21. Petitioner also asserts that Mr. Pachamanov testified that, in the ’089 patent, “[t]he trigger is something that starts the process of selection,” which “aligns with Kuruvilla’s disclosure that the method ‘begins with the trigger (at step

203).” *Id.* (citing Ex. 1007 ¶ 41) (alteration in original). Petitioner further contends that Patent Owner’s attempt to distinguish Kuruvilla’s triggers as “passive” is unavailing because Mr. Pachamanov admitted that Kuruvilla discloses “event-based triggers,” and “the ’089 [p]atent discloses periodical (passive) triggers too.” *Id.* at 21–22 (citing Ex. 1034, 79:10–80:4; Ex. 1001, 3:64–66; Ex. 1007 ¶¶ 10–14).

Based on the full trial record, we find that Petitioner has sufficiently shown that the Olofsson-Kuruvilla combination teaches this limitation. Olofsson discloses selecting a subset of available UEs from the originating network and “providing signaling from the first communication network for triggering the user equipment to perform test or measurement of the second communication network.” Ex. 1006, Fig. 1, 9:9–12, 10:20–22, 20:6–8, code (57); Ex. 1003 ¶ 246. Kuruvilla discloses that its method “begins with the trigger.” Ex. 1007 ¶ 41, Figs. 2, 3; Ex. 1003 ¶¶ 247, 251. We agree with and find credible Dr. Kotzin’s testimony that “[i]t would have been obvious to a person of ordinary skill in the art that if the information collector instructs only selected UEs to measure signals and must first perform the selection, that the trigger would apply to the information collector for selecting the UEs,” and that this modification could have been made “without substantial modification or undue experimentation.” Ex. 1003 ¶¶ 251, 256. We further credit Dr. Kotzin’s testimony that one of ordinary skill would have recognized that using a trigger for the selecting as well as the instructing of the UEs would “regulate when the information collector selects and instructs the UEs to take measurements, thereby achieving further benefits of conserving UE battery power and reducing network load.” *Id.* ¶ 258. Based on this evidence, we find that using the trigger to initiate

the selecting and instructing of the UEs would have been a minor variation of Olofsson's system that would have been obvious to and well within the skill of a person of ordinary skill in the art.

We also disagree with Patent Owner's argument that neither Olofsson or Kuruvilla individually discloses using a trigger for selection of terminals, because this argument considers the references in isolation. PO Resp. 40–41. Additionally, Patent Owner's argument that Kuruvilla "passively reacts to events" and "triggers measurements in response to those events" is not persuasive because claim 1 does not include any limitation that would exclude "passive" triggers, and Kuruvilla discloses "event based triggers." Ex. 1007 ¶¶ 10–14.

For these reasons, Petitioner has proven by a preponderance of the evidence that claim 2 would have been obvious based on the Olofsson-Kuruvilla combination.

6. *Dependent Claims 3 and 4*

Claim 3 depends from claim 1, and recites that "the information collector is further configured to obtain location information for at least one of the at least part of the plurality of terminals prior to selecting the one or more terminals." Ex. 1001, 12:11–15. Claim 4 depends from claim 3, and recites that "the information collector is further configured to associate the location information with at least one of the selected one or more terminals and provide the location information associated with the at least one of the selected one or more terminals to the coverage estimator." *Id.* at 12:16–21.

Petitioner argues that Olofsson's UEs "comprise a GPS or other positioning system to determine location information," and Olofsson "expressly discloses that '*[t]he selection process (11) preferably*

includes . . . UE location, i.e., the geographical position for which measurement data is desired.” Pet. 69–70 (quoting Ex. 1006, 10:3–6 (alterations in original); citing Ex. 1006, 17:29–18:4). Therefore, Petitioner argues, the information collector obtains the UE location “prior to selecting the one or more terminals, since UE location is taken into account as part of the selection process.” *Id.* at 70 (citing Ex. 1003 ¶ 262). Petitioner also argues that the combination teaches the corresponding structure for this process because, “[f]or the information collector to include UE location in the selection process and then instruct the UE to obtain measurement information,” the information collector “would be configured to associate the location information with at least one of the selected one or more terminals.” *Id.* at 71 (citing Ex. 1003 ¶ 268). Additionally, with respect to claim 4, Petitioner argues that Olofsson teaches providing the UE location with the signal measurements in the measurement report, which is ultimately provided to the TES, as well as corresponding structure in terms of an information collector configured to perform this functionality. *Id.* at 74–77 (citing Ex. 1006, 14:6–17, 17:27–29).

Petitioner further argues that Kuruvilla discloses the claimed associating functionality of claim 3, because its data collection module (information collector) receives location information from the UEs, which includes a mobile identification number, and maps the precise mobile location data at a given time. Pet. 72 (citing Ex. 1007 ¶¶ 8–9, 15–16, 18, 21). Additionally, according to Petitioner, Kuruvilla discloses providing data, including the location information associated with selected terminals, to the post processing module (coverage estimator) via the data collection

module (information collector), and therefore satisfies claim 4. *Id.* at 74 (citing Ex. 1007 ¶ 56).

With respect to claim 3, Patent Owner argues that Olofsson does not disclose or suggest “**obtaining** location information for at least one of the terminals **prior to** selecting the one or more terminals,” but instead merely states that “‘preferably’ the UE location has to be taken into account during the selection process,” which is “the only disclosure on the topic.” PO Resp. 43. Patent Owner also asserts that “Kuruvilla does not disclose or suggest a selection process at all, and is silent about any consideration of location information prior to triggering a terminal to perform measurements.” *Id.*

With respect to claim 4, Patent Owner argues that “the location information disclosed by Olofsson/Kuruvilla that is associated with the terminals and sent to the TES/data collection module is *not* initial location information obtained by the information collector *prior to selecting* the terminal to perform measurements,” as the claim requires. PO Resp. 45. “Instead,” according to Patent Owner, “both Olofsson and Kuruvilla disclose associating and sending the actual location information that is obtained *when the measurement information* is being collected.” *Id.* To support this argument, Patent Owner points to the ’089 patent specification’s disclosure that the location of the terminals may change between the time of the terminal is selected and the time the terminal actually performs the measurement. *Id.* at 46 (citing Ex. 1001, 9:20–29). Thus, Patent Owner contends, if the location at the time of measurement is sent (as Olofsson and Kuruvilla purportedly do), “the terminal may have moved outside the area of interest.” *Id.* (citing Ex. 2008 ¶ 124).

With respect to claim 3, Petitioner responds that, because “Olofsson discloses that the ‘selection process (11) preferably includes . . . UE location,” one of ordinary skill “would have understood that the information collector obtains location information prior to selecting if UE location is taken into account in the selection process.” Pet. Reply 22 (citing Ex. 1006, 10:3–6; Ex. 1003 ¶ 262) (alteration in original). With respect to claim 4, Petitioner argues that Kuruvilla discloses providing location to the post processing module. *Id.* at 25 (citing Pet. 74–76; Ex. 1007 ¶ 56, Fig. 5). Therefore, according to Petitioner, one of ordinary skill “would have understood that in the Olofsson-Kuruvilla combination, the information collector would be configured to provide pre-selection location to the post processing module.” *Id.* (citing Ex. 1036 ¶ 61). Additionally, Petitioner contends, pre-selection location information may include “cell-level location information,” which Olofsson discloses being provided by the UE when it registers with the network. *Id.* at 26 (citing Ex. 1006, 8:16–17). Finally, Petitioner argues that there is no requirement that a “UE’s pre-selection location information must differ from the measurement report’s location information”; for example, if the UE remains in the same cell between selection and measurement. *Id.* at 27 (citing Ex. 1036 ¶¶ 68–70; Ex. 1034, 33:24–34:2).

We determine that Petitioner has sufficiently shown that claims 3 and 4, including the claimed functions and corresponding structure, would have been obvious over Olofsson in view of Kuruvilla. With respect to claim 3, Olofsson discloses that “[t]he selection process (11) preferably includes . . . UE location, i.e., the geographic position for which measurement data is desired.” Ex. 1006, 10:3–6. We agree with and find

credible Dr. Kotzin’s testimony that one of ordinary skill would have understood from this disclosure of Olofsson that the system obtains the UE location information for the terminal(s) prior to selecting the terminal(s). Ex. 1003 ¶ 262. Based on this evidence, we find that Olofsson discloses obtaining location information prior to selecting the terminal(s), and that, in the proposed Olofsson-Kuruvilla combination, this would have been performed by the “information collector,” as discussed above. *See* § II.D.4(b), *supra*. We disagree with Patent Owner’s assertion that Olofsson’s disclosure is insufficient because it only states that “preferably the UE location has to be taken into account during the selection process.” PO Resp. 43. In order for the UE location to be taken into account during the selection process, the location has to be obtained before the actual selection occurs.

With respect to claim 4, Olofsson discloses associating the location information with at least one of the selected terminals. As Dr. Kotzin persuasively testifies, one of ordinary skill “would have understood for the information collector to perform the selection process based in part on UE location and then instruct the UE to obtain measurement information,” the information collector “would be configured to associate the location information with at least one of the selected one or more terminals.” Ex. 1003 ¶ 268. Olofsson also discloses that it was known for a UE’s system to “receive[] and store[] the recorded call and GPS information and graphically display[] this information, along with a map indicating the location of the mobile telephone.” Ex. 1006, 3:10–12. We agree with and find credible Dr. Kotzin’s testimony that this disclosure further shows that one of ordinary skill “would have understood how to associate the UE’s

location information with the selected UE, and would have understood Olofsson’s disclosure as teaching such an association.” Ex. 1003 ¶ 269.

We also find that Kuruvilla teaches the claimed associating function. Kuruvilla explains that “the system includes an associated mobile unit which has a global positioning system which is used in order to derive the location information,” and “[t]he data collection module collects RF signal measurements and location information from multiple phones in response to a trigger.” Ex. 1007 ¶¶ 8, 21. The system also “map[s] the precise location data of the radio frequency signal [of a mobile unit] representing the positioning of the mobile unit at a given time.” *Id.* ¶ 9; *see id.* ¶¶ 15–16. We agree with and find credible Dr. Kotzin’s testimony that one of ordinary skill would have understood from this evidence that the components of the system (which act as an “information collector” in the Olofsson-Kuruvilla combination) are “configured to associate the location information with at least one of the UEs.” Ex. 1003 ¶¶ 270–271.

Additionally, we find that the Olofsson-Kuruvilla combination teaches “provid[ing] the location information associated with the at least one of the selected one or more terminals to the coverage estimator,” as claim 4 also requires. Specifically, Olofsson discloses providing location information along with the signal measurements in the measurement report, which (as explained above) is ultimately provided to the entity responsible for evaluating the measurements. Ex. 1006, 14:10–12 (“If the UE is capable of receiving GPS (Global Positioning System) information, positioning information from a GPS receiver is preferably included with test results in a measurement report.”); 17:27–29 (“measurement data is preferably combined with a geographical position of the measurement”); *see* Ex. 1003

¶ 282. Kuruvilla also discloses providing data (including the location information associated with selected terminals) to the post processing module (coverage estimator) via the data collection module. Ex. 1007 ¶ 56, Fig. 5; *see id.* ¶¶ 8, 9, 15–16, 18, 34, 54; Ex. 1003 ¶¶ 284, 286.

We disagree with Patent Owner’s argument that Olofsson and Kuruvilla only disclose associating and sending location information “that is obtained when the measurement information is being collected,” and not “initial location information obtained by the information collector prior to selecting the terminal to perform measurements,” as the claim requires. *See* PO Resp. 45. As discussed above, Olofsson discloses obtaining location information from terminals prior to selection, and Olofsson and Kuruvilla both disclose sending location information along with measurements to an entity responsible for evaluating the information (the coverage estimator). Kuruvilla also discloses that the report generated by the post processing module “will allow a network administrator to know where mobile units 10A–10B are located during the time the trigger was activated” and, as discussed with respect to claim 2 above, the trigger in the Olofsson-Kuruvilla combination occurs prior to selection. *See* Ex. 1036 ¶ 61; § II.D.5, *supra*. Patent Owner points to no disclosure in Olofsson or Kuruvilla that the location information provided to the entity for evaluating the measurements cannot be the initial location information taken prior to selection, and must be location information at the time measurements are taken, and we see no such disclosure. *See* PO Resp. 44–47; PO Sur-reply 25–27. We agree with and find credible Dr. Kotzin’s testimony that one of ordinary skill “would have understood based on the disclosure of Olofsson and Kuruvilla, that the information collector would have been configured to

provide location information from prior to selection to the post processing module or TES,” because this testimony is consistent with the disclosures of the references. Ex. 1036 ¶ 61.

Additionally, we agree with Petitioner and Dr. Kotzin that the “location information” may include “cell-level location information,” which Olofsson discloses being provided by the UE when it registers with the network, and that it also would have been obvious to provide this cell-level location information to the post processing network or coverage estimator. Ex. 1006, 8:16–17, 10:3–6, 14:14–15; Ex. 1036 ¶¶ 63–67.

For the above reasons, Petitioner has proven by a preponderance of the evidence that claims 3 and 4 would have been obvious based on the Olofsson-Kuruvilla combination.

7. Dependent Claim 5

Claim 5 depends from claim 1 and recites that “the information collector is further configured to provide location information valid upon obtaining the measurement information for at least one of the selected one or more terminals.” Ex. 1001, 12:22–26.

Petitioner argues that the Olofsson-Kuruvilla combination discloses this limitation. Pet. 77–78. Specifically, Petitioner argues that, as explained for claim 4, Olofsson discloses providing location information along with the measurement information, and also argues that this location information was valid when obtained from the UEs. *Id.* at 77 (citing Ex. 1006, 14:6–17, 17:27–29). According to Petitioner, its argument “is consistent with the ’089 [p]atent, which describes location information sent by the UE along with the measurement information as location information valid when the measurement information was obtained from the UE.” *Id.* at 77–78 (citing

Ex. 1001, 9:20–33). Petitioner also contends that the Olofsson-Kuruvilla combination discloses corresponding structure in the form of an information collector configured to provide the claimed location information, and the combination teaches an interface to the communication link that carries the claimed location information. *Id.* at 78. Finally, Petitioner argues that one of ordinary skill “would have been motivated to modify Olofsson’s system configured to provide the claimed location information with Kuruvilla’s data collection module” for the reasons discussed above with respect to the motivation to combine the references. *Id.* (citing Pet. 22–31; Ex. 1003 ¶ 293).

Patent Owner does not provide separate argument for claim 5, and instead relies on its argument for claim 1. PO Resp. 48.

Based on the full trial record, we find that Petitioner has proven by a preponderance of the evidence that claim 5 (including the claimed function and corresponding structure) would have been obvious over the combination of Olofsson and Kuruvilla.

8. Independent Claims 11, 13, and 15

Independent claim 11 is similar to claim 1 but is generally directed to “[a] mobile user terminal for use in an automatic coverage assessment method” instead of “[a]n automatic coverage assessment system” as in claim 1. Ex. 1001, 13:8–55. Independent claims 13 and 15 are similar to claim 1 but are generally directed to “[a] network node for use in a telecommunications infrastructure comprising a first wireless access network and a second wireless access network.” *Id.* at 14:25–48, 14:51–15:8. Petitioner relies on similar arguments for claims 11, 13, and 15 as for claim 1. Pet. 79–88, 90–91.

Patent Owner asserts that claims 11, 13, and 15 “have similar requirements as the ‘information collector’ and ‘coverage estimator’ elements of [c]laim 1, and have similar requirements in their preambles for the portion of the preamble of [c]laim 1” discussed in the Patent Owner Response. PO Resp. 13. Consequently, Patent Owner relies on its arguments for claim 1 for claims 11, 13, and 15. *Id.*

Based on the full trial record, for the reasons set forth in the Petition and with respect to claim 1, we find that Petitioner has proven by a preponderance of the evidence that claims 11, 13, and 15 would have been obvious over the combination of Olofsson and Kuruvilla.

9. Dependent Claim 14

Claim 14 depends from claim 13. Claim 13 recites “[a] network node for use in a telecommunications infrastructure comprising a first wireless access network and a second wireless access network,” and claim 14 recites that the “coverage estimator is included within the network node.” Ex. 1001, 14:25–27, 14:49–50.

Petitioner argues that Olofsson’s TES is included within the network node because it is described as a “network entity” that is in “the base station of the target cell.” Pet. 88 (citing Ex. 1006, 14:18–21; Ex. 1003 ¶ 333). Petitioner also asserts that Kuruvilla “discloses the coverage estimator (post processing module) in communication with the network 12, which comprises the data collection module.” *Id.* at 89 (citing Ex. 1007 ¶ 34). Relying on the testimony of Dr. Kotzin, Petitioner argues that it would have been obvious to one of ordinary skill “for the coverage estimator to be included in Claim 13’s network node” because, “[b]efore the time of the alleged invention, it was well known for a node to contain the functions of

the coverage estimator and the functions described in Claim 13.” *Id.* Additionally, Petitioner argues that it would have been obvious to modify Olofsson’s network node to contain both the information collector and coverage estimator functionality in order to reduce network signaling. *Id.* at 90 (citing Ex. 1006, 14:23–26; Ex. 1003 ¶ 336).

Patent Owner does not provide separate argument for claim 14, and instead relies on its arguments for claims 1 and 13. PO Resp. 48.

Based on the full trial record, we find that Petitioner has proven by a preponderance of the evidence that claim 14 would have been obvious over the combination of Olofsson and Kuruvilla.

III. CONCLUSION

For the reasons discussed above, Petitioner has proven, by a preponderance of the evidence, that the challenged claims are unpatentable, as summarized in the following table:

Claim(s)	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5, 11, 13–15	103(a)	Olofsson, Kuruvilla	1–5, 11, 13–15	
Overall Outcome			1–5, 11, 13–15	

IV. ORDER

Accordingly, it is

ORDERED that claims 1–5, 11, and 13–15 of the ’089 patent have been shown to be unpatentable; and

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

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