

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AT&T MOBILITY LLC, AT&T SERVICES INC., ERICSSON INC.,
NOKIA OF AMERICA CORPORATION, AND T-MOBILE USA, INC.,
PETITIONERS,

v.

DAINGEAN TECHNOLOGIES LTD.,
PATENT OWNER.

CASE IPR2024-00310
PATENT 10,932,207

PATENT OWNER'S RESPONSE
37 C.F.R. § 42.120

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CURRENT EXHIBIT LIST¹

No.	Brief Description
1001	U.S. Patent 10,932,207 (“’207 Patent”)
1002	Prosecution History of U.S. Patent 10,932,207 (“’207 File History”)
1003	Declaration of Mark Mahon, Ph.D. (“Mahon Declaration”)
1004	Curriculum Vitae of Mark Mahon, Ph.D.
1005	US Patent Publication No. 2017/0019930 (“Lee1”)
1006	US Patent Publication No. 2010/0255847 (“Lee2”)
1007	Dahlamn et al. 4G, LTE-Advanced Pro and the Road to 5G (3rd ed. 2016)
1008	Harri Holma and Antti Toskala LTE for UMTS (2009)
1009	Nokia, “Considerations on NR RACH procedures,” R2-168013 (Nov. 2016)
1010	3GPP TS 36.331 v13.0.0 (2016) (“TS 36.331”)
1011	3GPP TS 25.214 v3.2.0 (Mar. 2000) (“TS 25.214 Release 1999”)
1012	3GPP TS 38.321 v16.1.0
2001	Declaration of Mr. Michael McBride in Support of Patent Owner’s Motion for Admission <i>Pro Hac Vice</i> of Michael McBride
2002	Expert Declaration of Dr. Karthikeyan Sundaresan
2003	U.S. Patent Publication No. 2015 0296525A1 to Kim (“Kim”)
2004	Second Expert Declaration of Dr. Karthikeyan Sundaresan
2005	For, The New Oxford American Dictionary (2nd Ed. 2005)
2006	Parameter, Webster’s New World Dictionary of Computer Terms (5th Ed. 1994).

¹ Relevant portions of exhibits may be highlighted to help the Panel find cited sections.

CLAIM LISTING

	Limitation
4[pre]	4. A base station device comprising:
4[a]	control circuitry configured to control a 2-step contention based random-access procedure and a 4-step contention based random-access procedure; and
4[b]	reception circuitry configured to receive a physical random access channel with a random access preamble in a first step of the 2-step contention based random-access procedure or in a first step of the 4-step contention based random-access procedure; wherein
4[c]	transmission power for the physical random access channel is given based at least on a PREAMBLE_RECEIVED_TARGET_POWER;
4[d]	for the 4-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(0) and a power-RampingStep(0); and
4[e]	for the 2-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(1) and a power-RampingStep(1).
5	5. The base station device according to claim 4, wherein the preambleInitialReceivedTargetPower(0) and the preambleInitialReceivedTargetPower(1) and the powerRampingStep(0) and the powerRampingStep(1) are given by radio resource control information.
6[pre]	6. The base station device according to claim 4,
6[a]	wherein the powerRampingStep(0) is a step size for power ramping up for the PREAMBLE_RECEIVED_TARGET_POWER for the 4-step contention based random access procedure, and
6[b]	the powerRampingStep(1) is a step size for power ramping up for the PREAMBLE_RECEIVED_TARGET_POWER for the 2-step contention based random access procedure.
8[pre]	8. A communication method used for a base station device comprising:
8[a]	controlling a 2-step contention based random-access procedure and a 4-step contention based random-access procedure; and
8[b]	receiving a physical random access channel with a random access preamble in a first step of the 2-step contention based random-access procedure or in a first step of the 4-step contention based random-access procedure; wherein

	Limitation
8[c]	transmission power for the physical random access channel is given based at least on a PREAMBLE_RECEIVED_TARGET_POWER;
8[d]	for the 4-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(0) and a power-RampingStep(0); and
8[e]	for the 2-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(1) and a power-RampingStep(1).

I. INTRODUCTION

AT&T Mobility LLC, AT&T Services, Inc., Ericsson Inc., Nokia of America Corporation, and T-Mobile USA, Inc. (collectively “Petitioners”) sought *inter partes* review of claims 4–6 and 8 (“Challenged Claims”) of U.S. Patent No. 10,932,207 (“’207 Patent” or “Patent-at-Issue”) based on two references, Lee1 and Lee2. Paper 2 (“Pet.”). The Board instituted a trial. Paper 9 (“Inst. Dec.”).

First Petitioner says that Lee1 alone anticipates or renders obvious the ’207 Patent. However, limitations found in all the claims recite elements preamble-InitialReceivedTargetPower(0)/powerRampingStep(0); and preambleInitial-ReceivedTargetPower(1) and a powerRampingStep(1). And, as Patent Owner explains herein, “(0)” and “(1)” denote separate elements where 0 is set “for” the 4-step and 1 is set “for” the 2-step contention based procedures. Yet, Petitioner does not argue Lee2 has different power settings for the 2- and 4-step procedures, or that it would be obvious based upon Lee2 alone to do so. As such, Petitioner has not shown Lee1 anticipates or renders the ’207 Patent obvious.

As for the Lee1/Lee2 combination, Petitioners arrive at the ’207 Patent’s claim limitations based solely upon their expert’s testimony. However, Petitioners’ expert merely says that Lee1 and Lee2 could be combined, that Lee1 could use Lee2’s power settings based upon one of four connection types—communication mode transition, reestablishment, handover, and data resume—and that doing so

would reduce latency. But Petitioners and their expert have not provided any explanation as to why a POSITA would not reduce latency for the 4-step contention procedure, only improving Lee1's 2-step contention procedure. Rather, the selective improvement appears to be a result-driven outcome.

Additionally, the Board has put forth its own "RSRP" and "multivariate" obviousness arguments that Petitioner did not make, in contravention of the Federal Circuit mandate that it is the petition that sets forth the unpatentability theories and that the Board is not free to deviate from these grounds. In any event, the measured RSRP is the same whether a UE is doing a 2- or 4-step procedure, and Lee2 does not advocate using multivariate functions (for example using the RSRP *and* the connection types), so there is no basis for this Board-created theory.

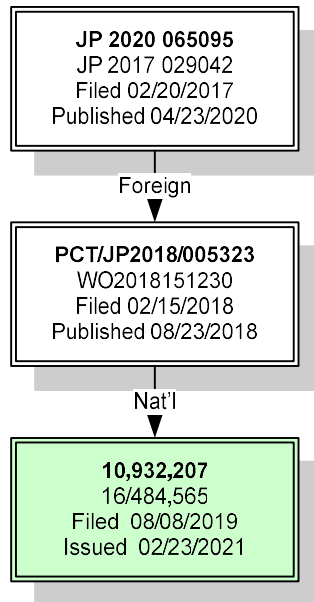
In a similar manner, the Board puts forth an alternate obviousness position based upon a claim construction whereby the limitations starting with "for the 4-step" and "for the 2-step" do not mean that the following recited items correspond to (i.e., are set based upon) whether the UE is doing a 4- or 2-step procedure. Patent Owner explains herein why this claim construction, and, hence, the obviousness theory based upon the construction, is not supported. Additionally, as with the RSRP and multivariate theories, this obviousness challenge is one that Petitioner did not advance. So, based upon Federal Circuit precedence, is likewise, not appropriately at issue in this trial.

These and other issues are examined in more detail in this Response.

II. OVERVIEW OF THE PATENT-AT-ISSUE

A. Family and Effective Filing Date

The '207 Patent is part of the following family.



As seen, the '207 Patent has an earliest possible priority date—which is also the '207 Patent's actual effective priority date—of February 20, 2017 (“Effective Priority”), and should be judged under the AIA regime.

B. Brief Overview of the Patented Invention

The '207 Patent concerns “provid[ing] [a] terminal apparatus capable of efficiently performing a random access to a base station apparatus.” Ex. 1001 1:53–55; 2:38–40.

1. Random Access Procedures

The '207 Patent teaches that there are two types of random access procedures,

“a contention based random access procedure and a non-contention based random access procedure.” *Id.* 12:14–16. In a non-contention based random access procedure, “the terminal apparatus 1 receives a random access preamble allocation” from a base station where “[the] random access preamble allocation may indicate a random access preamble index.” *Id.* 14:59–15:2. In contrast, in a contention based random access procedure the UE generates the random access preamble index, and the index does not come from the base station. *Id.* 12:22–35.

The '207 Patent discloses two types of contention based random access procedure embodiments: 2- and 4-step varieties. *Id.* 12:13–23. The '207 Patent shows one embodiment of a four-step contention procedure below:

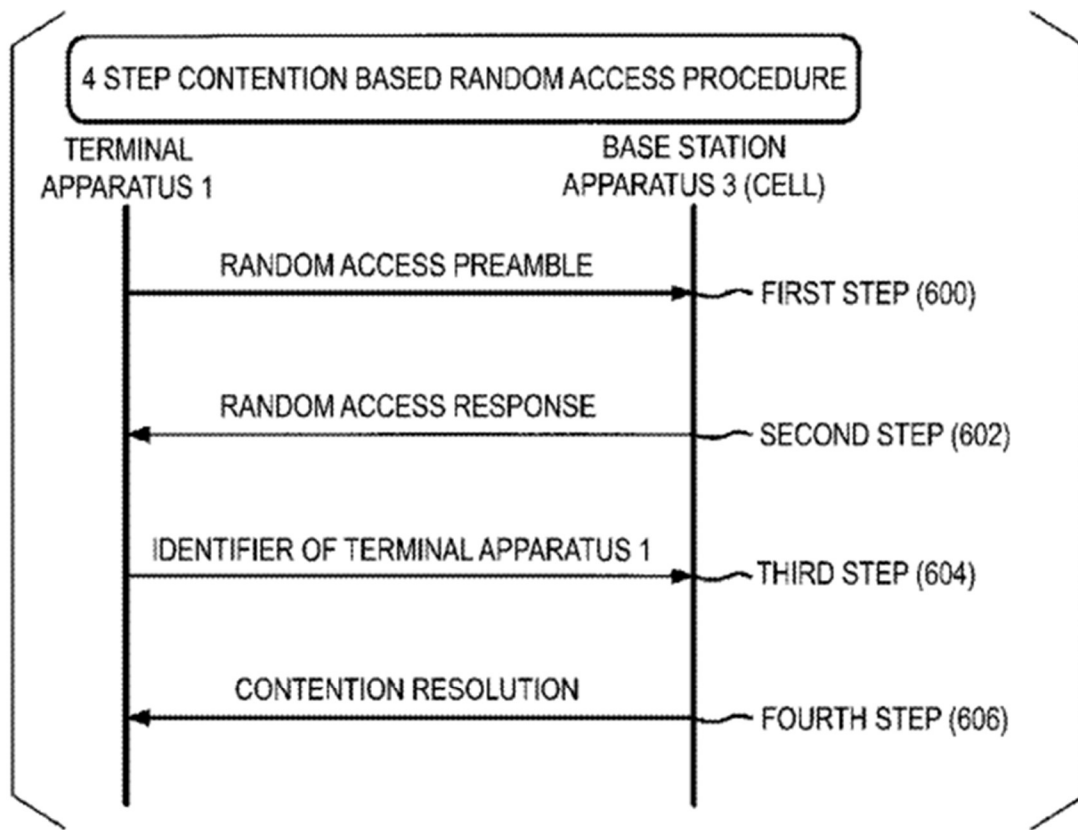


FIG. 6

Id. Fig. 6. In the first step, a “terminal apparatus 1 transmits [a] random access preamble . . . in the PRACH [physical random access channel] [and] . . . the MAC layer itself of the terminal apparatus 1 selects a random access preamble index.” *Id.* 12:29–33.

In the second step, the base station sends “a random access response . . . in the PDSCH,” the Physical Downlink Shared Channel, scheduled in the physical downlink control channel (“PDCCH”) using a Random Access–Radio Network

Temporary Identifier (“RA-RNTI”) to scramble the CRC where the RA-RNTI is “based on a PRACH resource [the terminal] used for transmission of the random access preamble in the first step.” *Id.* 12:36–44. “The random access response includes a random access preamble identifier for indicating the random access preamble index, an uplink grant, information for indicating a Temporary-RNTI, and information for indicating a timing advance.” *Id.* 12:42–46. When the terminal sees the random access preamble identifier that corresponds to the index the UE used when it sent its random access preamble, the UE knows its preamble has been received and uses the configuration information from the base station. *Id.* 12:46–51.

In step 3, at the time “scheduled by the uplink grant included in the random access response,” “the terminal apparatus 1 transmits an identifier . . . [either] [t]he identifier of the terminal apparatus 1 or the C-RNTI,” Cell–Radio Network Temporary Identifier. *Id.* 12:52–58. “The identifier of the terminal apparatus 1 or the C-RNTI is included in the PUSCH [Physical Uplink Shared Channel] . . . [that was] scheduled by the uplink grant included in the random access response.” *Id.* 12:54–58.

Finally, in step 4, the UE receives “contention resolution . . . [that] may be a UE contention resolution identifier or the C–RNTI.” *Id.* 12:59–61. If the base station uses a UE contention resolution identifier, “the UE contention resolution

identifier is included in the PDSCH [where] the PDCCH for the Temporary C-RNTI is used for scheduling of the PDSCH.” *Id.* 13:1–4. If the base station uses a C-RNTI, the C-RNTI is the temporary identifier “the terminal apparatus . . . transmitted . . . in the PUSCH in the third step.” *Id.* 12:59–67. If the “terminal apparatus . . . receive[s] the PDCCH for the C-RNTI” “the terminal apparatus . . . transmitted . . . in the PUSCH in the third step (604),” *id.* 12:61–64, or “the UE contention resolution identifier matches the identifier of the terminal apparatus 1 transmitted in the third step (604),” the terminal knows “the contention resolution has successfully been performed and . . . the random access procedure has successfully completed,” *id.* 12:64–67, 13:11–16.

The '207 Patent shows one embodiment of a 2-step contention procedure below:

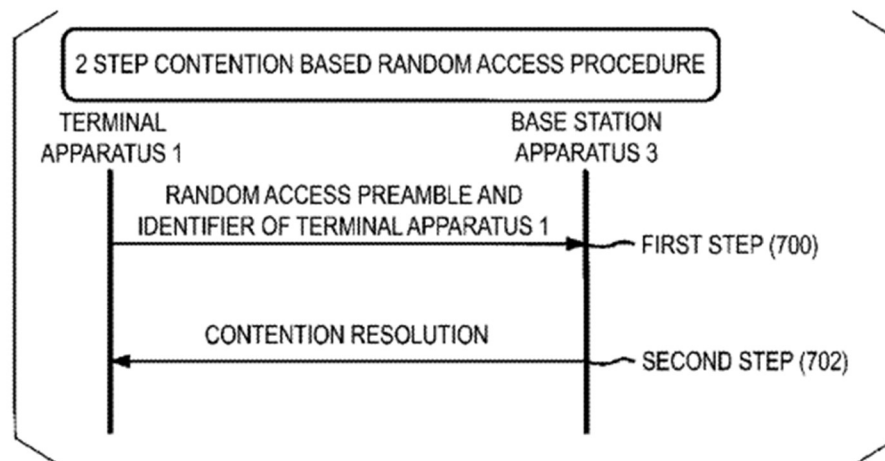


FIG. 7

Id. Fig. 7. As seen, unlike the 4-step procedure where the terminal sends the random access preamble and the identification of the terminal separately, “[i]n the first step (700), [both] a random access preamble and an identifier of the terminal apparatus 1 are transmitted.” *Id.* 13:22–23. Like the 4-step contention procedure, “[t]he random access preamble may be included in the PRACH,” *id.* 13:25–26, and “the MAC layer itself of the terminal apparatus 1 selects [the] random access preamble index,” *id.* 13:29–31. Also, like the 4-step contention procedure, “[t]he identifier of the terminal apparatus 1 may be included in the PUSCH.” *Id.* 13:26–27. Though, “[t]he random access preamble and the identifier of the terminal apparatus 1 may [also] be included in an identical physical channel.” *Id.* 13:26–29. “[T]he identifier of the terminal apparatus 1 may be a C-RNTI,” *id.* 13:23–24, or “identifier of the terminal apparatus,” *id.* 13:52–55.

“In the second step (702), the terminal apparatus 1 receives contention resolution . . . [that] may be a UE contention resolution identifier or the C-RNTI.” *Id.* 13:34–36. If the base station uses a C-RNTI, the base station will transmit in the PDCCH using the C-RNTI “the terminal apparatus . . . transmitted . . . in the first step (700).” *Id.* 13:36–39. If the base station uses a UE contention resolution identifier, “[t]he UE contention resolution identifier is included in the PDSCH,” scheduled by “a DCI format [with] CRC [bits] scrambled with an X-RNTI [where]

[t]he X-RNTI may be given based at least on a . . . PRACH resource . . . used for the transmission of the random access preamble in the first step (700) and/or a . . . PUSCH resource . . . used for the transmission of the identifier of the terminal apparatus.” *Id.* 13:43–50. Like the 4-step contention procedure, [t]he X-RNTI may be an RA-RNTI.” *Id.* 13:50–51. “The PDSCH scheduled by the PDCCH for the X-RNTI may include some or all of an uplink grant . . . information for indicating the C-RNTI, and information for indicating a timing advance.” *Id.* 13:63–66.

If the terminal apparatus receives the PDCCH including the C-RNTI “the terminal apparatus . . . transmitted . . . in the first step,” *id.* 13:37–39, or “the identifier of the terminal apparatus 1 transmitted in the first step,” *id.* 13:58–60, the terminal “consider[s] that the contention resolution has successfully been performed and that the random access procedure has successfully completed,” *id.* 13:35–52, 13:60–63.

The '207 Patent discloses that “after the first step of the 2 step contention based random access procedure, a transition may be performed from the 2 step contention based random access procedure to the 4 step contention based random access procedure . . . [i]n a case that the base station apparatus 3 detects a random access preamble [but] cannot detect an identifier of the terminal apparatus 1 in the first step.” *Id.* 14:17–24.

A base station may use the 2-step contention procedure with some terminals

and the 4-step contention procedure with other terminals. *See, e.g., id.* Fig. 16.

The base station (cell) may also transmit/broadcast “system information,” *id.* 16:32–33, including “information for indicating a Reference Signal Received Power (RSRP) threshold,” *id.* 16:55–57. “The terminal apparatus 1 measures RSRP from a down link reference signal of the cell [and] may initiate either the 2 step contention based random access procedure or the 4 step contention based random access procedure based on the measured RSRP and the threshold of the RSRP.” *Id.* 16:61–66. Specifically, “[i]n a case that the measured RSRP does not exceed the threshold of the RSRP, the terminal apparatus 1 may initiate the 4 step contention based random access procedure [whereas] [i]n a case that the measured RSRP exceeds the threshold of the RSRP, the terminal apparatus 1 may initiate the 2 step contention based random access procedure.” *Id.* 16:66–17:5.

2. Power of Terminal Transmissions

In the '207 Patent, the power with which a terminal apparatus transmits a random access preamble in the PRACH in the first step of the 2- and 4-step contention based random access procedure is given by P_{PRACH} . *Id.* 26:42–48. The power with which a terminal apparatus transmits the identifier of the terminal apparatus or the C-RNTI in the first step of the two step, and third step of the 4-step, contention based random access procedure is given by P_{PUSCH} . *Id.* 26:42–48.

In one embodiment, the P_{PRACH} is equal to the

PREAMBLE_RECEIVED_TARGET_POWER, which can be the sum of preamble-

$$\text{InitialReceivedTargetPower}(m) + \text{DELTA_PREAMBLE}(F) +$$

$$[(\text{PREAMBLE_TRANSMISSION_COUNTER} - 1) * \text{powerRampingStep}(m)].$$

Id. 29:31–38. The preambleInitialReceivedTargetPower may be “configured by higher layers (RRC)” and may take on different values, being a function of m .

Id. 29:40–45. For instance, $m=0$ could specify the “4 step contention based random access procedure” and $m=1$ could specify the “2 step contention based random access procedure.” *Id.* DELTA_PREAMBLE may also be “configured by higher layers (RRC)” and is a function of F , where F “corresponds to a PRACH format.”

Id. 29:46–50.

In one embodiment, the terminal sets the PREAMBLE_TRANSMISSION_COUNTER to 0 in Step 2000 of Figure 20 shown below prior to performing step 1 of the contention based random access procedures in Step 2002. *Id.* 26:37–56.

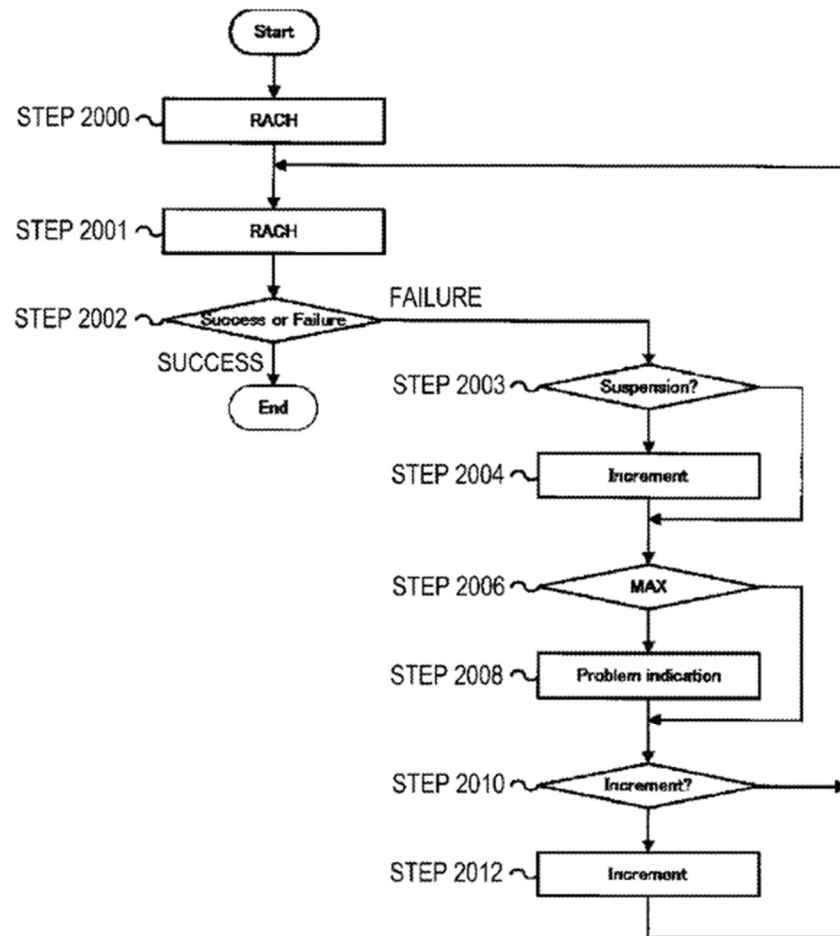


FIG. 20

Id. Fig. 20. The variable powerRampingStep may be “configured by higher layers (RRC)” and may be a function of m , like preambleInitialReceivedTargetPower. *Id.* 29:46–47. Thus, the terminal may set powerRampingStep independently for different configurations, such as the 2- and 4-step contention based random access procedures.

“[T]he terminal apparatus 1 may ramp up the transmit power for the transmission of the PRACH transmitted in the first step of the 2 [or 4] step contention

based random access procedure, based on a failure of random access response reception or contention resolution.” *Id.* 30:23–34. A failure may be where a “random access response is not received in the random access response window,” *id.* 27:5–12, or the terminal does not receive a random access response or contention resolution in a certain amount of time, *id.* 27:13–34. For instance, “the MAC of the terminal apparatus 1 may determine whether to increment the power ramp up counter by one (step 2010)” if “the MAC of the terminal apparatus 1 determine[s] that the random access procedure has failed in step 2002,” assuming “no power ramping suspension notification has been received from the lower layer (physical layer).” *Id.* 28:39–48.

As the Board notes, the initial and power ramping steps may transmit the initial values, step values, and $\text{DELTA_PREAMBLE}(F)$ which may correspond to a PRACH format given by F . Inst. Dec. 5–6 (citing Ex. 1001 29:62–30:15).

As shown in decision point 2006 in the flow chart of Figure 20, P_{PRACH} may be capped at a maximum transmit power for a subframe i of serving cell c , $P_{\text{CMAX},C(i)}$, taking into account the downlink path loss estimate as calculated by the terminal apparatus, PL_C . *Id.* 29:20–31.

C. Related Prosecution Events

On August 4, 2020, the Office issued a Non-Final Rejection. Ex. 1002 at

4034–41.² In the office action, the Examiner cited three prior art references, U.S. Patent Publication No. 2018/0110074 A1 to Akkarakaran et al. (“Akkarakaran”), U.S. Patent Publication No. 2018/0205516 A1 to Jung et al. (“Jung”), and U.S. Patent Publication No. 2015/0296525 A1 to Kim et al. (“Kim”). *Id.* 4038–40.

The Examiner noted that Akkarakaran and Jung “discloses to select a four step contention based RACH procedure when the RSRP is below a threshold and switch to a two step contention based RACH procedure when the RSRP is above a threshold,” but neither reference “disclose[s] the transmission power (PREAMBLE_RECEIVED_TARGET_POWER) for . . . a four step contention based RACH procedure associated with preambleInitialReceivedTargetPower and a powerRampingStep(0) and the transmission power (PREAMBLE_RECEIVED_TARGET_POWER) for the two-step contention based RACH procedure associated with preambleInitialReceivedTargetPower and a powerRampingStep(1).” *Id.*

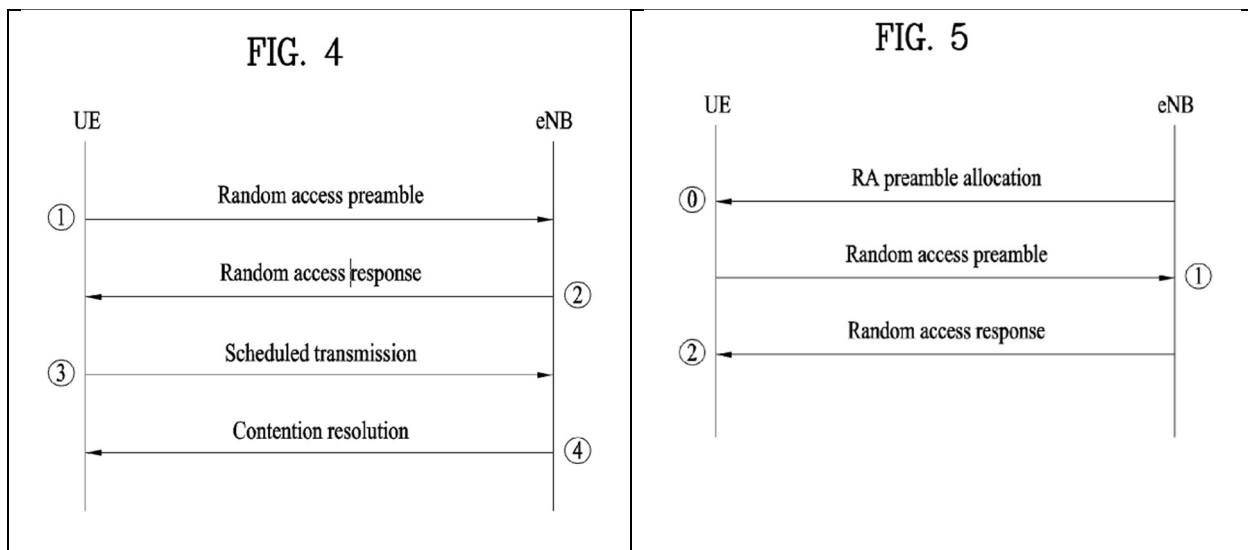
As for Kim, the Examiner noted that:

Kim discloses to determine the PREAMBLE_RECEIVED_TARGET_POWER (transmission power as disclosed in Par 0057) for the four-step contention based RACH procedure (Fig. 4) based on the preambleInitialReceivedTargetPower and

² Patent Owner refers to the last four digits of the Bates numbering.

a powerRampingStep (Fig. 4, Par 0056–0060). Kim further discloses to determine the PREAMBLE_RECEIVED_TARGET_POWER (transmission power as disclosed in Par 0057) for a two-step contention free RACH procedure (Fig. 5) based on the preambleInitialReceivedTargetPower and a power-RampingStep (Fig. 5, Par 0057, Par 0065-0068). The power ramping step for the four-step contention based RACH procedure is different than the power ramping step for the two-step contention free RACH procedure (Par 0075-0076).

Id. at 4039. Indeed, Kim discloses the following figures showing its 4-step contention and 2-step contention-free procedures:



Ex. 2003 Figs. 4–5. And Kim disclosed that with the 4-step contention procedure the transmission power for the first step is given by:

$$\begin{aligned} &\text{Transmission power of random access} \\ &\text{preamble} = \text{preambleInitialReceivedTargetPower} + \\ &\text{DELTA_PREAMBLE} + (\text{PREAMBLE_TRANSMISSION_COUNTER} - 1) * \text{powerRampingStep} \end{aligned} \quad [\text{Equation 1}]$$

Ex. 2003 [0055–57].

But the Examiner further explained that “Kim does not disclose PREAMBLE_RECEIVED_TARGET_POWER as well as power ramping step powerRampingStep(1)) for the two-step *contention based* random access procedure.” *Id.* at 4039–40 (emphasis added). As such, the Examiner did not issue a 103 rejection over any of the references. *Id.* 4038 (noting the claims “would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112”).

In sum, the prior art showed 4-step and 2-step procedures, and even different initial and power ramping for the 4-step contention and 2-step contention free procedures, but there was no teaching of using different initial and step power for a 2-step contention procedure versus a 4-step contention procedure. *See also* Inst. Dec. (“According to our review of the prosecution history . . . the Examiner determined that none of the cited prior art taught or suggested *different* power ramping for the 4-step and 2-step contention-based procedures.”).

On October 15, 2020, the Applicant addressed the § 112 issues and further amended the claims “to more particularly claim the intended subject matter.” *Id.* at 4066. Specifically, the claims were “further amended to recite preambleInitial-

ReceivedTargetPower(0) for 4-step random access procedure and preambleInitialReceivedTargetPower(1) for 2-step random access procedure.” *Id.* An exemplary amended claim is shown below.

Claim 3 (currently amended): A terminal device comprising:

control circuitry configured to control a 2-step contention based random-access procedure and a 4-step contention based random-access procedure; and

transmission circuitry configured to transmit a physical random access channel with a random access preamble in a first step of the 2-step contention based random-access procedure or in a first step of the 4-step contention based random-access procedure; wherein

transmission power for the physical random access channel is given at least based on a PREAMBLE_RECEIVED_TARGET_POWER;

for the 4-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(0) and a powerRampingStep(0); and

for the 2-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on the a preambleInitialReceivedTargetPower(1) and a powerRampingStep(1).

Id. at 4061 (highlighting added). As seen, the amendments make clear that the initial target power as well as the power ramping step are a function of an input where 0 corresponds to the 4-step and 1 corresponds to the 2-step. Indeed, the applicant replaced the definite article “the” before preambleInitialReceivedTargetPower by the indefinite article “a” for preambleInitialReceivedTargetPower(1) making clear that the latter is not the former.

After doing an additional search, *see id.* 4094–97, on October, 27, 2020, the Office issued a Notice of Allowance and reiterated that while “[t]he references on

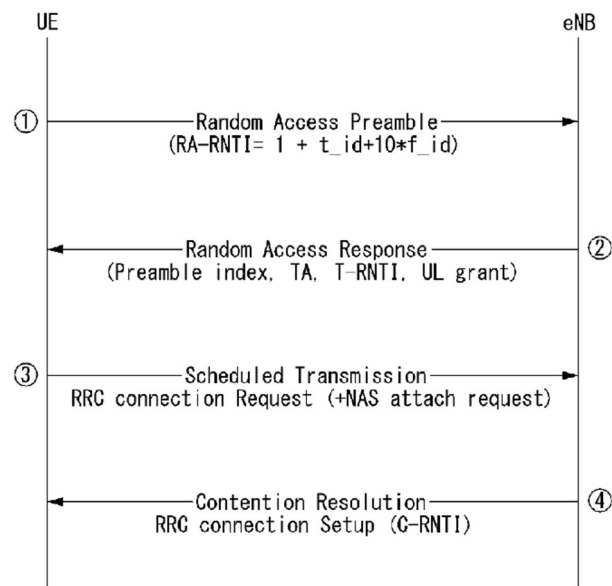
record disclose individual features that are recited in the claimed invention . . . the combined teachings of the prior art references do not teach or reasonably suggest the claimed invention as a whole,” *id.* 4083–88.

III. OVERVIEW OF THE CITED REFERENCES

A. Overview of U.S. Patent Publication No. 2017/0019930 (“Lee1”)

Relevant to this proceeding, Lee1 “define[s] [a] 2-step random access procedure in order to minimize latency of the related art 4-step random access procedure.” Ex. 1005 [0006]. Lee’s four step procedure involves “(1) a step in which the terminal transmits a random access preamble to the BS . . . (2) a step in which a random access response is received from the BS in response . . . (3) a step in which an uplink message is transmitted by using information received in the random access response message . . . , and (4) a step in which a message corresponding to the uplink message is received from the BS.” *Id.* [0123]. Lee1 illustrates its 4-step procedure below.

[Fig. 9]



Lee1, Ex. 1005 Fig. 9.

Lee teaches that, with the 4-step random access procedure, “[t]he terminal sets transmission power of the random access preamble (PREAMBLE_RECEIVED_TARGET_POWER)” in the “[f]irst message (Msg 1, message 1)” according to the following formula:

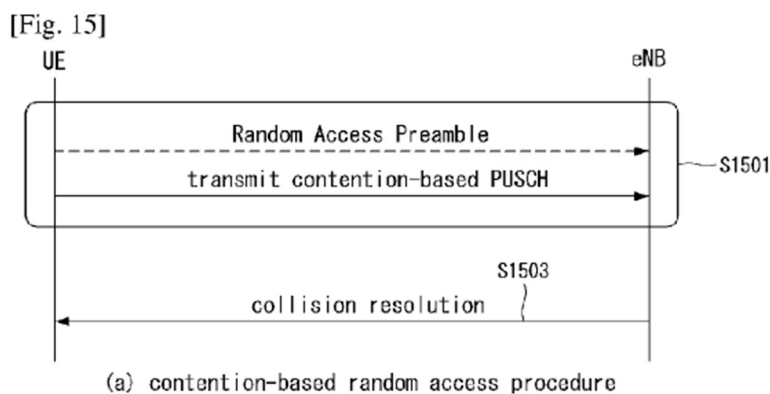
$$\begin{aligned}
 &\text{preambleInitialReceivedTargetPower} && + \\
 &\text{DELTA_PREAMBLE} && + \\
 &(\text{PREAMBLE_TRANSMISSION_COUNTER} [-] 1) * \\
 &\text{powerRampingStep}
 \end{aligned}$$

Ex. 1005 [0150–52]. Lee1 teaches that the variable preambleInitialReceived-TargetPower “indicate[s] [an] initial transmission power,” DELTA_PREAMBLE “indicates a power offset value according to a preamble

format, PREAMBLE_TRANSMISSION_COUNTER “indicates the number of preamble transmissions,” and powerRampingStep “indicates a power ramping factor.” Ex. 1005. *Id.* [0152]. “These values are signaled as part of system information to the terminal.” *Id.*

In the same section describing Fig. 9 and the four step procedure, Lee1 teaches a different power scheme for Message 3, whereby the UE uses the power specified by the base station in Message 2. *Id.* [0156] (explaining that the UL grant in Message 2 (Msg 2) from the base station in response to the random access preamble to the BS “includes the UL resource allocation that is used for transmission of the scheduling message to be described later (Message 3) and the transmit power command (TPC) [that] is used for determination of the transmission power for the scheduled PUSCH”).

Lee1’s 2-step method is described as: “[1] an RRC message . . . is transmitted to a BS together with an RACH preamble [and] [2] an RRC message is transmitted by the BS to the UE in response thereto.” *Id.* [0315]. Lee1 illustrates this below.



Id. Fig. 15.

B. Overview of U.S. Patent Publication No. 2010/0255847 (“Lee2”)

Lee2 concerns “a method for transmitting random access parameters from the base station 120, where the random access parameters are set differently according to events [or cases] that trigger random access . . . [where] [t]he parameters may be transmitted via various methods before the events[/cases] occur.” Ex. 1006 [0054].

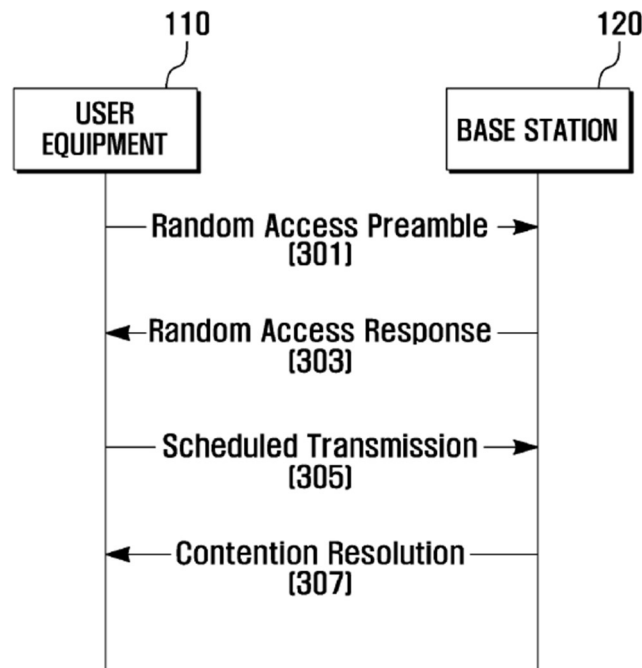
“[T]he events (or cases) include idle to connected mode transition (Case 1), Radio Resource Control (RRC) connection re-establishment (Case 2), handover (Case 3), and DownLink/UpLink (DL/UL) data resume (Case 4).” *Id.* [0009].

“The random access parameters include initial transmission power Preamble_In[i]tial_Power_n, ramping power Ramping_Power_n, maximum transmission power Max_Preamble_power_n, backoff window Backoff_Window_n, retrieval number Retrieval_number_n, and maximum number of retransmission Max_Total_Tx_Num.” *Id.* [0030]. “For example, the parameters of the initial transmission power, Preamble_Initial_Power, are defined as Preamble_Initial_Power_1, Preamble_Initial_Power_2, . . . , Preamble_Initial_Power_n, according to corresponding events (cases) 1, 2, . . . , n.” *Id.* [0059].

“Referring to FIG. 3, when an event for trigg[er]ing random access has occurred, the user equipment 110 transmits a random access preamble to the base station 120 using transmission power corresponding to the event in step 301.”

Id. [0045].

FIG . 3



Id. Fig. 3. For example, on one hand, “[i]n Case 1 (Idle to connected mode transition) and Case 2 (RRC connection re-establishment), transmission power is relatively low in the initial transmission of a preamble.” *Id.* [0038]. “On the other hand, in Case 3 (handover) and Case 4 (DL/UL data resume), transmission power is relatively high in an initial transmission of a preamble.” *Id.* [0039].

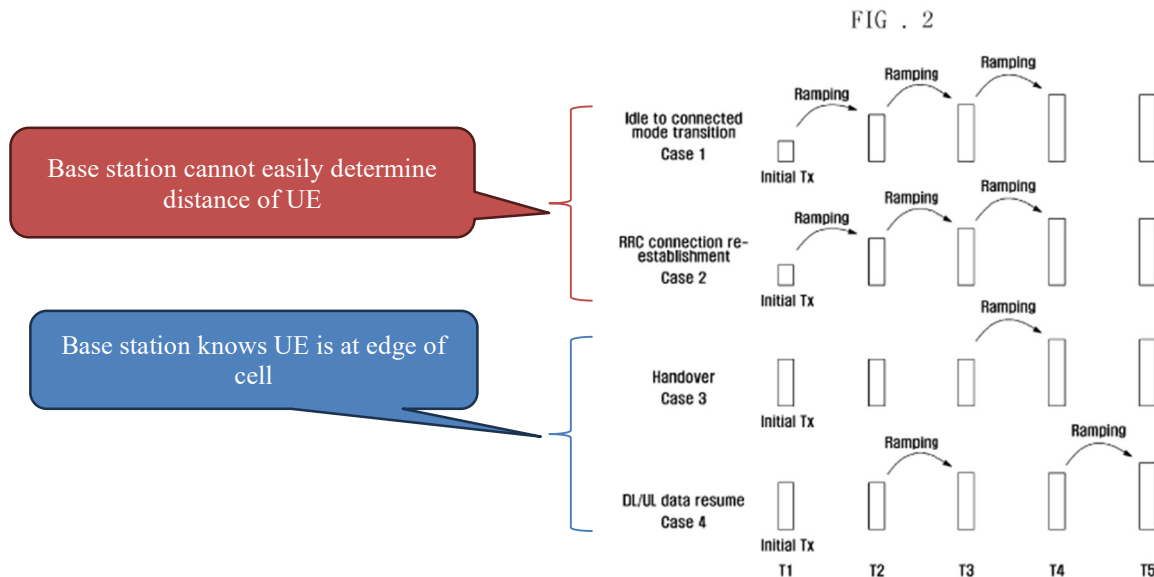
“Each time that the user equipment 110 has not received a random access response after transmitting or re-transmitting a preamble to the base station 120, it repeats re-transmission a preset number of times. The user equipment 110 retransmits the preamble using ramping power corresponding to the event for

triggering random access. For example, as shown in FIG. 2, if the event corresponds to Case 1 (idle to connected mode transition) or Case 2 (RRC connection re-establishment), the user equipment 110 increases transmission power by a preset ramping power each time that re-transmission (T2–T4) is performed.” *Id.* [0047–49].

Lee2 explains why different power parameters make sense for the handover and DL/UL data resume cases versus the idle to connected and reconnection cases: the base station knows that the UE is on the edge of the cell for the former cases but cannot readily determine the location of the UE for the latter cases. *See, e.g., id.* [0038] (“In Case 1 (Idle to connected mode transition) and Case 2 (RRC connection re-establishment), transmission power is relatively low in the initial transmission of a preamble . . . [s]ince it is difficult to detect where user equipment is located in a cell of a serving base station.”); [0040] (“In Case 3 (handover), since the user equipment needs to transmit a preamble at a cell edge between a serving base station and a target base station, it is set in such a way that it increases transmission power to a relatively high level in the initial transmission of the preamble. It is also set in such a way that the preamble is transmitted three times using the same transmission power.”); [0041] (showing Case 4 also occurs during a cell switch); [0010] (“If a user equipment and a base station are located near each other, the user equipment can transmit a preamble to the base station using a

relatively low level of transmission power. On the contrary, if the user equipment is located at a cell edge furthest from the base station, and transmits a preamble to the base station using a relatively low level of transmission power, the base station may fail to receive the preamble.”).

Lee2 illustrates this discrimination based upon distance as so:



Ex. 1006 Fig. 2 (annotations added).

IV. LEVEL OF ORDINARY SKILL IN THE ART

Petitioners propose a person of ordinary skill in the art (“POSITA”) at the ’207 Patent’s effective priority date “would have had a B.S. in Electrical Engineering or a related field with at least three years of experience designing, developing, and/or testing telecommunication systems,” including “familiarity with the wireless standards and well-known protocols for accessing wireless networks,” and that “[m]ore education may supplement practical experience or *vice versa*.”

Pet. 10 (citing Ex. 1003 ¶36). Patent Owner proposed that a POSITA would only need two years of experience. Paper 11 (“POPR”), at 24.

The Board preliminarily adopted Petitioners’ formulation but agreed that the difference between Patent Owner and Petitioners’ formulations would not affect the patentability analysis. Inst. Dec. 8. Patent Owner maintains that two years is more appropriate but agrees that the analysis is the same under either proposition.

V. CLAIM CONSTRUCTION—THE MEANING AND UNDERSTANDING REGARDING THE FOUR FUNCTIONS OF M=0/1

[4d] for the 4-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a **preambleInitialReceivedTargetPower(0)** and a **powerRampingStep(0)**; and

[4e] for the 2-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a **preambleInitialReceivedTargetPower(1)** and a **powerRampingStep(1)**.

While neither Party requested a formal construction of any term, the Board identified a dispute requiring Board resolution regarding the following terms found in limitations 4d/e shown above (and similarly situated in 8d/e):

- preambleInitialReceivedTargetPower(0);
- preambleInitialReceivedTargetPower(1);
- powerRampingStep(0); and
- powerRampingStep(1).

Inst. Dec. 9. Moreover, the Board undertook to define what it meant for the

“(0)” and “(1)” versions of the functions to be “for” the 4-step and 2-step procedures. *Id.* 13–14.

A. The Claims Require Four Functions that Evaluate Input Values 0 and 1

Petitioners argue that it may show that the limitations are satisfied by identifying the same PREAMBLE_RECEIVED_TARGET_POWER using the same constant values, preambleInitialReceivedTargetPower and powerRampingStep, for both the “(0)” and “(1)” limitations, Pet. 27–29 (citing Ex. 1005 at [0152]), where PREAMBLE_RECEIVED_TARGET_POWER equals

$$\begin{aligned} &\text{preambleInitialReceivedTargetPower} && + \\ &\text{DELTA_PREAMBLE} && + \\ &(\text{PREAMBLE_TRANSMISSION_COUNTER} [-] 1) * \\ &\text{powerRampingStep} \end{aligned}$$

Ex. 1005 [0152]. That is, Petitioners put forth an implicit position that the four terms resolve to “two values: a common preambleInitialReceivedTargetPower and a common powerRampingStep.” Inst. Dec. 9 (citing Pet. 31).

In contrast, Patent Owner’s position is that the identified items are four functions that evaluate an input value corresponding at least to the two input values, 0 and 1. This is so, because the format of the items used in limitations 4c and 4d, *name* followed by parenthesis, specify that the preambleInitialReceivedTargetPower() and powerRampingStep(), are functions. Ex. 2002 ¶¶20–25. That is, they are a function of, or dependent on, the item within the parentheses, the independent

variable. Per the claims, that independent variable is different for the two different random access procedures.³ *Id.*; see also *ON Semiconductor Corp. v. Power Integrations, Inc.*, IPR2016-00809-67, at 26–27 (PTAB Sept. 22, 2017) (positively noting a party’s description of a “function” as “[a] variable quantity regarded in relation to one or more other variables in terms of which it may be expressed or on which its value depends”) (citing *The New Shorter Oxford English Dictionary* (1993)), *vacated on unrelated ground, Power Integrations, Inc. v. Semiconductor Components Indus., LLC*, 926 F.3d 1306 (Fed. Cir. 2019); see also *Texas Advanced Optoelectronic Sols., Inc. v. Intersil Corp.*, No. 4:08-cv-00451, 2013 WL 10996554, at *12–13 (E.D. Tex. June 10, 2013) (explaining “function of” means “depends on” and not merely “corresponds to”).

Moreover, as the Board noted, if the values `preambleInitialReceivedTargetPower(0)` and `preambleInitialReceivedTargetPower(1)` or `powerRampingStep(0)` and `powerRampingStep(1)` were construed as single values, the “(0)” and “(1)”

³ At a minimum, like the use of ordinal numbering, the claims’ use of different inputs to the functions `preambleInitialReceivedTargetPower()` and `powerRampingStep()` in limitations 4c and 4d indicate that these are independent values specified for the 4-step and 2-step procedures, and Petitioners cannot identify the same item as satisfying both claim elements. See *Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1373 (Fed. Cir. 2005) (“The terms ‘first, second, and third’ are terms to distinguish different elements of the claim.”).

claim language would be superfluous. Inst. Dec. 10–11 (citations omitted). And “[a]n interpretation that renders language superfluous is strongly disfavored.” *VirnetX Inc. v. Apple Inc.*, 792 F. App’x 796, 811 (Fed. Cir. 2019).

Petitioners’ position is based upon the part of the *specification* that states “[c]ommon preambleInitialReceivedTargetPower[/powerRampingStep] *may be* used for the 2 step contention based random access response procedure [and] the 4 step contention based random access response procedure.” Pet. 31 (citing Ex.1001 30:3–11) (emphasis added). But the specification uses permissive language, noting an embodiment “may” have a common initial and ramping step. Ex.1001 30:3–11. The claims that define the scope of the invention require that preambleInitialReceivedTargetPower() and a powerRampingStep() be a function of one input (identified as “0”) for the 4-step procedure and another input (identified as “1”) for the 2-step procedure. *Tempo Lighting, Inc. v. Tivoli, LLC*, 742 F.3d 973, 977 (Fed. Cir. 2014) (“In claim construction, this court gives primacy to the language of the claims, followed by the specification.”). Following Petitioners’ view would erroneously remove limitations found in the claims based on one embodiment found in the specification.

Indeed, it is well-established that a “claim may well not cover [a disclosed] embodiment . . . [and a] patentee may draft different claims to cover different embodiments.” *Intamin Ltd. v. Magnetar Techs., Corp.*, 483 F.3d 1328, 1336–37

(Fed. Cir. 2007) (citations omitted); *see also Cybersettle, Inc. v. Nat'l Arbitration Forum, Inc.*, 243 Fed. App'x 603, 607 (Fed. Cir. 2007) ("Patents frequently contain claims to devices or methods whose scope includes fewer than all the embodiments that would routinely be used in practice."). And, as the Board noted, the specification uses a different term, such as "preambleInitialReceivedTargetPower"—sans parenthesis—when describing "common" power variables. Inst. Dec. 11–12 (citing Ex. 1001 at 26:14–41; 27:60–63; 28:13–15; 30:3–11).

Therefore, the disclosure in the specification that the 2- and 4-step procedures may have common values is not a valid basis to override the claim limitations requiring otherwise.

Further, the prosecution history supports Patent Owner's position. During prosecution, the patentee amended the claims and explicitly explained that "preambleInitialReceivedTargetPower(0) [is] for 4-step random access procedure and preambleInitialReceivedTargetPower(1) [is] for 2-step random access procedure." *See supra* § II.C; *see also* Ex. 1002, at 4066. And the Examiner noted the prior art disclosed "**different** power ramping step (powerRampingStep(0) and powerRampingStep(1))." Ex. 1002, at 4109. Additionally, the applicant replaced the definite article "the" before preambleInitialReceivedTargetPower by the indefinite article "a" for preambleInitialReceivedTargetPower(1) making clear that

the latter is not the former. Ex. 1002 at 4061. These Prosecution History events also support that it was the Office's and applicant's view that the parentheses with different numbers indicated different items.

B. The Claims Require the Initial Power and Power Ramping Functions for “(0)” and “(1)” Correspond to the 4- and 2-Step Procedure Types

While Patent Owner acknowledges that the sentence construction is awkward—as is often the case with claim limitations, *see Funai Elec. Co., Ltd. v. Daewoo Electronics Corp.*, 616 F. 3d 1357, 1372 (Fed. Cir. 2010) (“The protocols of claim writing can lead to awkward phrasing, for the claim is restricted to a single sentence.”)—it is Patent Owner's position that preambleInitialReceivedTargetPower(0)/powerRampingStep(0) *corresponds to* the 4-step procedure and preambleInitialReceivedTargetPower(1)/powerRampingStep(1) *corresponds to* the 2-step procedure. POPR 12. The Board preliminarily disagreed saying that requiring correspondence improperly imports limitations from the specification into the claims because the claims only say that the functions are “*for* the 4-step” and “*for* the 2-step,” Inst. Dec. 13–14 (emphasis added), and “claim 4 does not actually require initial power and power ramping correspond to or *be dependent on procedure type*,” *id.* 26. Patent Owner respectfully disagrees for the following reasons.

The specification uses the same awkward “for” language as used in the claims, and a POSITA understood that this indicates the *m* value is set based upon the number of steps. Ex. 2004 ¶¶3–5; *see also Phillips v. AWH Corp.*, 415 F.3d 1303,

1312–13 (Fed. Cir. 2005) (en banc) (explaining that claim terms are to be given the meaning that the term would have “to a person of ordinary skill in the art in question at the time of the invention”). While “for” has many meanings, the ’207 Patent uses “for” to mean “representing (the thing mentioned),” as in “‘F’ is *for* Fascinating,” as having (the thing mentioned) as a *purpose or function*,” and “having (the thing mentioned) as a *reason or cause*.” Ex. 2005 at 4 (emphasis added). The specification uses “for” in this manner, saying that preambleInitialReceivedTargetPower and powerRampingStep are functions of m where “ m is 0 *for* the 4 step contention based random access response procedure and the non-contention based random access procedure” and “ m is 1 *for* the 2 step contention based random access procedure.”⁴ Ex. 1001 29:51–57. This is standard terminology for functions, meaning that “ m ” is based on the number of steps and “ m ” is set so the function evaluates correctly. Ex. 2004 ¶4. That is, the UE calculates its power formula setting $m = 0$ “for” the 4-step or non-contention based random access procedures and $m = 1$ “for” the 2-step procedure.

Indeed, the specification specifically says that DELTA_PREAMBLE(F) “*corresponds*” to a PRACH format (denoted by “F”), Ex. 1001, 49–50, where the

⁴ Patent Owner is not limiting the claims to the embodiments in the specification where 0 is “for” both the non-contention based procedure and the 4-step procedure, but tracking the claim language that says 0 is “for” the 4-step procedure.

base station transmitted “***higher layer (RRC) information (parameter) for*** indicating DELTA_PREAMBLE (F),” *id.* 13–21 (emphasis added), and uses a parallel format and language when describing how to set “m,” saying “[t]he base station apparatus 3 may transmit ***higher layer (RRC) information (parameter) for*** indicating powerRampingStep (0) and higher layer (RRC) information (parameter) for indicating powerRampingStep (1),” *id.* 29:66–30:2 (emphasis added). That is, in each instance, the base station sends a “parameter” that ***defines*** the DELTA_PREAMBLE represented by “F” and ***defines*** the initial/step power to use represented by “m.” *See* Ex. 2006 (noting “parameters” characterize or define a system). A POSITA would recognize that the same treatment of “(m)” and “(F),” where “(F)” “corresponds” to the format, also supports that the “(m)” parameter of the claim “corresponds” to the higher layer configuration of the power, with m being dependent upon whether the system is performing a 4-step or 2-step procedure.⁵ Ex. 2004 ¶5.

In addition, the Examiner expressed his understanding that m=0 and m=1 were “associated” with the four and two step procedures when explaining his reason for allowance. Ex. 1002 at 4038–40 (noting the prior art does not disclose the transmission power for the four step contention based RACH procedure ***associated***

⁵ Again, the ’207 Patent’s embodiment says the system should set m=0 for the non-contention based procedure, while the claim has no such requirement.

with powerRampingStep or the two-step contention based RACH procedure ***associated*** with powerRampingStep(1)) (emphasis added). The prosecution history too, then, supports that the claims ***do*** actually require initial power and power ramping be associated with (i.e., correspond to) procedure type. *See TorPharm, Inc v. Ranbaxy Pharms, Inc.*, 336 F.3d 1322, 1330 (Fed. Cir. 2003) (explaining that “[p]atent examination would serve little purpose unless the scope of the exclusive patent right correlated with the matter allowed by the PTO” so that a court should take notice when a patentee “lets stand an examiner’s restrictive interpretation of a claim”).

Furthermore, the Petitioners explained when discussing Lee2 that “[t]he variable ‘n’ in ‘Preamble_Intial_Power_n’ and ‘Ramping_Power_n’ signifies that the values of these parameters differ for different types of random access (i.e., n = 1 ***corresponds*** to a first type of random access, n = 2 ***corresponds*** to a second type of random access, etc.).” Pet. 41 (citing Ex. 1003 ¶92) (emphasis added). Petitioner is correct: a POSITA understood that a parameter like “_n” in Lee2 and “(m)” in the ’207 Patent “corresponds to” types of random access for Lee2 and the number of steps in the procedure for the claims of the Patent-at-Issue. *See Arthur A. Collins, Inc. v. N. Telecom Ltd.*, 216 F.3d 1042, 1044–45 (Fed. Cir. 2000) (“Even when prior art is not cited in the written description or the prosecution history, it may assist in ascertaining the meaning of a term to a person skilled in the art . . . because it may

indicate not only the meaning of the term to persons skilled in the art, but also that the patentee intended to adopt that meaning.”) (citation omitted). Hence, both Parties have a common understanding that the initial and step power values *correspond to* the number of steps.

In sum, as shown from the plain meaning, the specification, and the understanding of both Parties and their experts, the claims require preambleInitialReceivedTargetPower(0)/powerRampingStep(0) to correspond to the 4-step procedure and preambleInitialReceivedTargetPower(1)/powerRampingStep(1) to correspond to the 2-step procedure.

VI. PETITIONERS’ PRIOR ART REFERENCES FAIL TO ANTICIPATE OR RENDER OBVIOUS ANY CHALLENGED CLAIM

A. Ground 1: Anticipated or Obvious over Lee1

1. Lee1 Does Not Disclose or Render Obvious a 2-Step Content Based Random Access Procedure with Independently Set Initial Target Power and Power Ramping Step

[4d] for the 4-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(0) and a powerRampingStep(0); and

[4e] for the 2-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(1) and a powerRampingStep(1).

Petitioners and their expert map the same singular value of preambleInitialReceivedTargetPower and powerRampingStep to both “(0)” and “(1)” limitations. Pet. 29–30 (citing Ex. 1005 at [0152]); Ex. 1003 ¶¶72–73 (same). However, as

explained in the claim construction section, the claims require separate functions for the 4-step and 2-step procedures, not met by a single set of initial and step power values. *See* § V *supra*.

Indeed, even in Petitioners' proposed modification "to extend Lee1's teaching of preambleInitialReceivedTargetPower and powerRampingStep to the 2-step contention-based random access procedure" Petitioner made no argument that the 2-step procedure would use *different* power settings. *Id.* 30. Rather, Petitioners' Lee1 argument rises and falls based upon Patent Owner being "incorrect" that "preambleInitialReceivedTargetPower(0) must differ from preambleInitialReceivedTargetPower(1) and/or powerRampingStep(0) must differ from powerRampingStep(1)." *Id.* 31. Patent Owner is not incorrect.

Lee1 simply does not teach there are separate power values for its 2- and 4-step procedures and Petitioner has not argued that it would be obvious to do so, so Petitioner has not shown Lee1 anticipates or renders the claims obvious.

2. Petitioners Fail to Show that Lee1 Teaches Limitations 8d/e's 2/4-Step Content Based Random Access Procedure with Independently Set Initial Target Power and Power Ramping Step

[8d] for the 4-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(0) and a powerRampingStep(0); and

[8e] for the 2-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(1) and a powerRampingStep(1).

Petitioners solely rely upon their arguments put forth for limitations 4d–e for limitations 8d–e. Pet. 36. Petitioners' arguments for 8d–e fails for the same reasons set forth above for limitation 4d–e in Section VI.A.1.

3. Petitioners Fail to Show Lee1 Anticipates or Renders Obvious the Challenged Dependent Claims

Because Petitioners have not shown independent claims 4 and 8 are anticipated or obvious over Lee1, Petitioners have also failed to meet their burden to show a reasonable likelihood that Lee1 renders any claims dependent on claim 4 and 8 unpatentable. *Corning Glass Works v. Sumitomo Elec. USA, Inc.*, 868 F.2d 1251, 1256 n.4 (Fed. Cir. 1989) (“Because we conclude that claim 1 is not anticipated, claim 2, which is dependent on claim 1, need not be separately discussed.”); *In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) (“Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious.”).

B. Ground 2: Obviousness over Lee1 in view of Lee2**1. Lee1 in View of Lee2 Does Not Disclose or Render Obvious a 2-Step Contention Based Random Access Procedure with Independently Set Initial Target Power and Power Ramping Step**

[4c] for the 4-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(0) and a powerRampingStep(0); and

[4d] for the 2-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(1) and a powerRampingStep(1).

a. Petitioner Has Not Shown a POSITA Would Have Had a Motivation to Modify Lee1 and Lee2 to Arrive at the '207 Patent Claims at Issue Requiring Initial and Step Power Set Based upon the Number of Steps

To be clear, Patent Owner is not contesting that Lee1 and Lee2 could be combined or that a POSITA would not have had a reasonable expectation of success in doing so. Lee2 could use Lee1's 2-step procedure, and Lee1 could use Lee2's different power settings *based upon the message format type*. That is, a skilled artisan, once presented with the two references, would have understood that they could be combined for what they teach. But "that is not enough" for obviousness, because Petitioner must show an artisan would have been motivated to "arrive at the claimed invention." *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993–994 (Fed. Cir. 2017). As set forth in the claim construction section, even a Lee1 and Lee2 combination must further be modified to vary the initial and step power *based upon whether the UE is doing a 2-step or 4-step contention procedure*. See § V.B

supra. Petitioner has not shown such motivation.

Lee1 does not provide motivation to use different power settings based upon the number of steps. As Petitioners implicitly admit, Pet. 30–31, and the Board preliminarily confirmed, Inst. Dec. 22, Lee1 does not say that its teachings regarding preamble transmission power ramping are applicable to the 2-step random access procedure.⁶ So, Petitioner and their expert reasoned that because Lee1’s 2-step procedure has the same steps of the 4-step procedure, with “the first step of 4-step random access” and “the third step of 4-step random access” “combined,” then it must be the case that Lee1’s “preambleInitialReceivedTargetPower and a powerRampingStep applies to both types of random access procedure.” Pet. 29–30; Ex. 1003 ¶71 (citing Ex. 1005 at Figs. 9, 22).

While Patent Owner maintains that Dr. Mahon’s reliance on a “conventional” 4-step procedure Ex. 1003 ¶¶46–47 (citing Ex. 1008 at Fig. 5.42) for the proposition that “power control of such preambles taught in paragraph [0152], are generally applicable regardless of the total number of steps that are necessary to complete random access,” Ex. 1003 ¶72, without explaining why power ramping is specifically applicable to Lee’s 2-step process, is insufficient motivation to combine

⁶ Lee1 only describes how “[t]he terminal sets transmission power of the random access preamble (PREAMBLE RECEIVED TARGET POWER),” including ramping, in the 4-step procedure. Ex. 1005 [0150–70].

the different Lee1 embodiments, *see In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017) (“[A] rejection . . . based on combining multiple embodiments from a single reference . . . must [have] a motivation to make the combination.”). Even if Petitioner is correct, Petitioners’ theory only advocates that Lee1 teaches ***to use the same*** preambleInitialReceivedTargetPower and a powerRampingStep for random access preambles transmitted to the base station as part of a 4-step contention based random access procedure.

And all Parties and the Board agree that Lee2 cannot teach varying initial and power ramping for a 2-step procedure, because “Lee2 only discloses 1 type of procedure—the conventional 4-step.” Inst. Dec. 25.

It is from this uncontroversial starting point that Petitioner must show a motivation to modify the Lee1 and Lee2 combination to vary the power parameters based upon the number of steps in the procedure. And Petitioner fails to articulate a sufficient rationale for why a skilled artisan would have sought to modify the asserted prior art to achieve the claimed invention.

In the only paragraph where Petitioners actually address motivation to arrive at the claim language, Petitioners ***rely solely on their expert***, saying “Lee2’s disclosure that using different transmission power control parameters for different types of random access procedure reduces time delay and improves system performance” would have motivated a POSITA “to further reduce the time delay

associated with 2-step random access procedure” by using “larger initial transmission power . . . for preambles transmitted as part of a 2-step random access procedure than those transmitted as part of a 4-step random access procedure.” Pet. 42 (*citing Ex. 1003 ¶¶ 59, 88–89*).

However, Petitioners’ expert does not say this, much less explain *why* a “larger initial transmission power” would “further reduce the time delay associated with 2-step random access procedure.” Ex. 1003 ¶¶ 59, 88–89. Paragraph 59 merely says that Lee1 has an object to reduce latency by combining 4 steps into 2. *Id.* ¶59 (citing Ex. 1005 at [1006] [sic: 0006]). Paragraph 88 merely says that Lee1 could be “supplemented” with Lee2 because “both references are directed to techniques for reducing the latency associated with random access,” with Lee1 specifically reducing latency by going from 4 steps to 2, and Lee2 changing power “based on events for triggering random access or cases” (i.e., “connected mode transition (Case 1), RRC connection re-establishment (Case 2), handover (Case 3), and DL/UL data resume (Case 4),” as set forth in the Petition on page 40). *Id.* ¶88. And, finally, Paragraph 89 merely says the references are complementary as they both reduce latency “[t]hus, a skilled artisan would have been motivated to combine Lee1 and Lee2 because combining the solutions disclosed in these references would result in a larger improvement to the overall latency associated with random access than either solution can achieve on its own.” Ex. 1003 ¶89.

Taking all the cited paragraphs together, Dr. Mahon’s explanation amounts to no more than Lee1 could vary its 2-step power “based on events for triggering random access or cases.” That is, a 2-step with larger initial power based ***upon the event being a handover*** may very well result in a lower latency than the 2-step handover with lower initial power, in the same way a 4-step with larger initial power ***based upon the event being a handover*** may result in a lower latency as Lee2 teaches. See Ex. 1006 [0045]; accord Inst. Dec. 27–28 (“[C]ombining Lee1 and Lee2 results in a 4-step procedure with initial power and ramping power functions set in accordance for a handover event.”). However, none of this explains why a POSITA would be motivated to modify Lee1 to use different power settings ***based upon whether the UE is doing a 2-step or 4-step contention procedure***.

To clarify further, Lee2 teaches to use higher initial power and lower ramping for handover procedures. Ex. 1006 [0045]. If Lee2 used such power setting for a 2-step procedure, this, according to Petitioners, would reduce latency. Pet. 42 (Ex. 1003 ¶¶ 59, 88–89). However, according to Lee2 this would reduce latency for the 4-step procedure as well. Ex. 1006 [0045] & Fig. 3. This begs the question: why then would a POSITA not use the same relatively high transmission power in the initial transmission and smaller power steps for a 4-step contention based procedure doing a handover as well? Lee1, Lee2, Petitioners, and Petitioners’ Expert have provided no rationale why this would be so.

Rather, as explained in the overview of Lee2, *supra* § III.B at page 21, Lee’s suggestion to use “case-dependent” power settings stems from Lee2’s observation that the base station can discern some UE connection requests (handover and DL/UL data resume) are coming from UEs that are on the periphery of the base station’s cell, so the system would benefit from an increased initial power and lower ramping values, and that the base station cannot easily determine the distance to the base station for other requests from UEs (idle to connected and RRC connection reestablishment), so the system would benefit from relatively lower initial power and higher ramping. But, as Dr. Sundaresan explains, a UE is physically the same distance from a base station regardless of whether the UE is performing a 2-step or 4-step connection procedure. Ex. 2002 ¶¶26–27. Therefore, a POSITA that understands Lee2’s explanation regarding the need for different power parameters for the type of connection (the “cases”) is no rationale to have different power parameters for 2- and 4-step connection procedures, as they would both equally benefit from the same power settings. *Id.*

In sum, Petitioners have not shown a motivation to arrive at limitations 4c and 4d, where the initial and step power of the contention based random access procedure is “for” (set dependent upon) a 2- or 4-step procedure.

b. The Board’s Obviousness Theories Are Unfair and Untestable

Having addressed Petitioners’ theories and evidence, Patent Owner now turns

to obvious theories that the Board created and were not put forward by Petitioner.

i. The Board’s “RSRP” and “Multivariate” Theories Have No Basis in the Petition and Cannot Be Investigated

First, the Board said that if Patent owner is correct that the claims do require the initial power and power ramping functions for “(0)” and “(1)” to correspond to the 4- and 2-step procedure types, a POSITA “*upon recognizing measured RSRP* [among other items], would have, in light of Lee2, seen a benefit and had a reasonable expectation of success in using initial power and power ramping functions dependent on procedure type.” Inst. Dec. 25 (emphasis added) (citing Ex. 1006 ¶¶ 63, 71–74). However, the Petitioners and their expert never reference RSRP once or cite any of the paragraphs the Board relies upon. *See generally* Pet. and Ex. 1003. That is, this is not Petitioners’ argument.

And the Board is not “free to adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner during an IPR . . . the Board must base its decision on arguments that were advanced by a party.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016); *see also Sirona Dental Sys. v. Institut Straumann AG*, 892 F.3d 1349, 1356 (Fed. Cir. 2018) (“[T]he statute tells us that the petitioners’ contentions, not the Director’s discretion, define the scope of the litigation all the way from institution through to conclusion.”) (citation and internal quotes omitted).

These Federal Circuit mandated guardrails make sense for at least two

reasons. First, there are no provisions for Patent Owner to explore the Board's assertion that Lee2's disclosure regarding RSRP to set power levels supports that a POSITA would use initial power and power ramping functions dependent on procedure type. For instance, the Board said that its RSRP basis had to do with the (1) Akkarakaran and Jung references cited during examination as teaching the use of RSRP to choose between 2- and 4-step contention procedures and (2) Patent Owner's expert supposed position that "there is correlation (albeit unreliable) between RSRP and distance."⁷ Inst. Dec. 25 (citing Prelim. Resp. 39; Ex. 1002 at 4039–40). But Patent Owner may not depose the Board to determine how exactly the Board is using the additional Akkarakaran and Jung references, not cited by Petitioner, in the Board's obviousness theory or to further probe the Board's understanding of Dr. Sundaresan's testimony, like Patent Owner could do with Petitioners' expert. *See* 37 C.F.R. § 42.51(b)(1)(ii).

Second, as the Federal Circuit explained, the Board-created arguments, even in the pursuit of "challenging patents that should not have issued," are fundamentally inconsistent with the adversarial IPR process that is "a system that is predicated on a petition followed by a trial in which the petitioner bears the burden of proof." *Magnum Oil Tools*, 829 F.3d at 1380–81. That is, because it is ***Petitioners'*** burden

⁷ Dr. Sundaresan actually said that "RSRP may *or may not correspond to distance*." Ex. 2002 ¶27.

to demonstrate a POSITA “would have been motivated to combine the teachings of the prior art references to achieve the claimed invention,” the PTO’s “authority is not so broad that it allows the PTO to raise, address, and decide unpatentability theories never presented by the petitioner.” *Id.* at 1381; *see also Sirona Dental*, 892 F.3d at 1356 (“It would thus not be proper for the Board to deviate from the grounds in the petition and raise its own obviousness theory.”).

In any event, the Board-cited portion of Lee2 teaches that “the user equipment 110 measures the RSRP from the base station 120, reflects the path loss between the user equipment 110 and the base station 120, according to the measured value, and sets the initial transmission power Preamble_Initial_Power_n_i.” Ex. 1006 [0071]. But just like a UE is physically the same distance from a base station regardless of whether the UE is performing one of Lee2’s cases (handover, data resume, idle to connected, and RRC reestablishment), so too does the UE measure the same RSRP regardless of whether it is doing a 2-step or 4-step connection procedure. So, Lee2 is simply teaching that if $RSRP = x$, use power settings y and z . Lee2 does not say that power should be based upon RSRP and anything else, like the four cases that Lee2 say can be *alternately* used (not used in conjunction). So, neither Lee2’s distance nor RSRP rationale for having different power parameters is a motivation to have different power parameters for 2- and 4-step connection procedures. Ex. 2002 ¶¶26–27.

Moreover, as Patent Owner previously argued, Petitioners have not explained why a POSITA would ignore Lee2's actual teaching to use the procedure type as a basis for power parameters or addressed the inherent conflict that would occur with using procedure type and Petitioners' proposal to use the number of steps in the procedure (e.g., a "low power" four-step procedure would be in tension if the four-step procedure was a "high power" handoff). Ex. 2002 ¶28. This is still true.

In response, the Board said "[i]n our view, solutions such as modifying *single-variable functions to be multivariable functions or prioritizing power control decisions seem within the skill of a POSITA.*" Inst. Dec. 26 (emphasis added) (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007)). First, just like the Board's RSRP argument, the Board's suggestion to modify Lee1/Lee2 to use a "multivariable function" is a completely Board generated proposal not put forth by Petitioner and likewise "is not proper." *Sirona Dental*, 892 F.3d at 1356.

Second, the Board has not pointed to anything in Lee1 or Lee2 showing the use of multivariate functions to set initial and step power. A Petitioner would be expected to provide expert testimony to supplement such a position not found in the cited references. Yet, the Board has not explained why a POSITA would take *both* Lee2's "cases" and the Lee1's number of steps into account, exactly what would be "prioritized" and when, and what benefits would arise in such a multivariate system that would lead a POSITA to create such a system. And Patent Owner has no

mechanism to find out.

Third, the Board's recognition that the modification to arrive at the '207 Patent's invention is "technically feasible" misses Patent Owner's point. Of course someone could have "technically" used the 2- and 4-steps as the basis to set the initial and power ramping—the inventors of the '207 Patent did. Failure of others to achieve the invention and skepticism that the invention would work may be indicia of non-obviousness, but such so-called secondary considerations are not *required* to be present to find non-obviousness. *see, e.g., Takeda Chem. Indus. v. Alphapharm Pty.*, 492 F.3d 1350, 1363 (Fed. Cir. 2007). Patent Owner's point is that nothing in Lee1 or Lee2, individually or combined, motivates a POSITA to set the power based upon the number of steps in the procedure. The Board's proposal is improper hindsight reconstruction of the claims.

ii. The Board's Alternative Obviousness Argument Is Founded upon an Incorrect Claim Construction and Is Also Against the Fundamental IPR Adversarial Framework

For Ground 2, the Board alternatively used a claim construction that both Parties explicitly or implicitly rejected: that the claims do "not actually require initial power and power ramping correspond to or be *dependent on procedure type*." Inst. Dec. 13. The Board recognized that Patent Owner's proposed construction explicitly requires the initial and step power *do* depend upon the step type. Inst. Dec. 13. And Petitioners arguing that a POSITA would set the initial and step

power *based upon the number of steps*, also tacitly grants that this *is* what the claims require. Pet. 42 (proposing a combination of Lee1 and Lee2 that “use[s] a larger initial transmission power (i.e., ‘preambleInitialReceivedTargetPower(1)’) and/or power ramping step (i.e., ‘powerRampingStep(1)’) *for preambles transmitted as part of a 2-step random access procedure than those transmitted as part of a 4-step random access procedure.*”) (emphasis added) (citing Ex. 1003 ¶¶ 88–89).

The Board then proposed a combination of Lee1 and Lee2 not put forth by Petitioner, but one that the Board created “[b]ased on our review of the record.” *Id.* 27. Specifically, the Board found that a 4-step with power and ramping *set for a handover event* and 2-step with power ramping *set for a connection re-establishment* would meet the Board’s claim construction, *id.*, rather than Petitioners’ theory that the initial and step power would be set for the 2- and 4-step random access procedures. Pet. 42.

First, the Board’s combination does not render the ’207 Patent obvious on the merits. Petitioner has already set forth why the evidence militates for Patent Owner’s construction that the “(m)” parameter is dependent on and corresponds to the number of steps in the random access procedure. *See* § V.B *supra*. And given that the Board’s combination is “[b]ased on the claim construction we set forth above . . .,” Inst. Dec. 26, this alternative obviousness determination cannot stand.

Second, and again, the Board is not “free to adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner during an IPR . . . the Board must base its decision on arguments that were advanced by a party.” *Magnum Oil Tools*, 829 F.3d at 1381. Here, it is apparent that the Board has created an argument Petitioner never raised based upon a claim construction not put forth by either Party—indeed a construction inconsistent with the constructions explicitly or implicitly put forth by Patent Owner and Petitioner. Therefore, based upon Federal Circuit precedent, the Board’s alternative obviousness basis is *ultra vires*. *Id.* (finding that the PTO’s “authority is not so broad that it allows the PTO to raise, address, and decide unpatentability theories never presented by the petitioner”); *see also Sirona Dental*, 892 F.3d at 1356.

2. Petitioners Fail to Show that Lee1 in View of Lee2 Teaches Limitation 8e’s Requirement That a 2-Step Content Based Random Access Procedure with Independently Set Initial Target Power and Power Ramping Step

[8d] for the 4-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(0) and a powerRampingStep(0); and

[8e] for the 2-step contention based random access procedure, the PREAMBLE_RECEIVED_TARGET_POWER is given based at least on a preambleInitialReceivedTargetPower(1) and a powerRampingStep(1).

Petitioners solely rely upon their argument put forth for limitations 4d–e for limitations 8d–e. Pet. 44. Petitioners’ argument for 8d–e fails for the same reasons

set forth above for limitation 4d–e in § VI.B.1.

C. Petitioners Fail to Show Lee1 in View of Lee2 Anticipates or Renders Obvious the Challenged Dependent Claims

Because Petitioners have not shown independent claims 4 and 8 are obvious over Lee1 in view of Lee2, Petitioners have also failed to meet their burden to show a reasonable likelihood that Lee1/Lee2 renders any claims dependent on claim 4 and 8 obvious. *In re Fine*, 837 F.2d at 1076.

VII. CONCLUSION

Petitioners now face a higher burden of persuasion than for institution and must show unpatentability to a “preponderance of the evidence” standard. 35 U.S.C. § 316(e). For the reasons set forth herein, Petitioners have not done this.

Dated: December 5, 2024

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

Per § 42.24(a)–(b) the undersigned certifies that the number of words in the paper, PATENT OWNER’S RESPONSE, is:

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Dated: December 5, 2024

/R. Allan Bullwinkel/
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CERTIFICATE OF SERVICE

The undersigned certifies that on the fifth day of December, 2024, a complete and entire copy of the foregoing “PATENT OWNER’S RESPONSE,” including exhibits, if any, was served on the following counsel of record via email per Petitioners’ consent to electronic service, see Paper 2 at 2:

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