

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD., AND SAMSUNG ELECTRONICS
AMERICA, INC.,
Petitioner,

v.

APEX BEAM TECHNOLOGIES LLC,
Patent Owner.

Case IPR2023-00602
Patent No. 10,568,113

PETITIONER'S REPLY

TABLE OF CONTENTS

I.	Introduction	1
II.	Apex’s “Triggering” Construction is Incorrect and Irrelevant to the Outcome	1
A.	There is No Basis or Support for Apex’s Construction of “Triggering the Transmission”	2
1.	Apex fails to provide a legitimate basis for swapping out “triggering” with “causing”	2
2.	Apex cannot point to any evidence to support its construction	3
B.	<i>Liu</i> Discloses the “Triggering” Limitation, Regardless of Whether Apex’s Construction is Applied	4
III.	Apex’s Different “Time Window” Constructions are Incorrect and Irrelevant to the Outcome	8
A.	Apex’s Different Constructions of the “Time Window” Limitations Lack Support and Merit	8
1.	Apex’s “time window” constructions are inconsistent with its district court construction.	9
2.	Apex’s “time window” constructions flout the law.	9
3.	Apex’s “time window” constructions improperly stray from the plain and ordinary meaning	11
a.	“First Time Window”	13
b.	“Third Time Window”	14
c.	“Second Time Window”	14
B.	<i>Liu</i> Discloses the “Time Window” Limitations, Regardless of Whether Apex’s Constructions Are Applied	16
IV.	<i>Liu</i> Discloses or Renders Obvious Transmitting Two Radio Signals on Two Channels	18

V.	Apex’s Teaching Away Argument for Ground 2 Fails	23
VI.	Apex’s Arguments Against the Other Claims Similarly Fail	24
VII.	The Board Should Give Mr. Gomez’s Declaration No Weight.....	25
VIII.	Conclusion.....	27

I. Introduction

As with the related IPR2023-00601 proceeding, Apex's Patent Owner's Response (Paper 16, "POR") repeats many of its Preliminary Patent Owner Response arguments, which were rejected by the Board at Institution, except it now tries to advance these arguments with several unsupported and meritless claim constructions. Not only are Apex's claim constructions erroneous, they are irrelevant to the outcome.

Apex also attacks *Liu* for allegedly not disclosing or rendering obvious transmitting two radio signals on two channels, despite *Liu* doing just that. Apex's attack on the motivation to combine *Liu* and *Jover* also fails because it improperly attacks the references individually.

Finally, the testimony of Apex's expert, Mr. Gomez, should be given no weight because he does not qualify as a POSITA.

For the reasons below, the Board should reject Apex's claim constructions and arguments, and find all challenged claims unpatentable.

II. Apex's "Triggering" Construction is Incorrect and Irrelevant to the Outcome

The Board should reject Apex's construction for "triggering the transmission" because it lacks support and merit. But, even if the Board were to accept Apex's construction, it would not affect the outcome because *Liu* still discloses the "triggering" limitation under Apex's construction.

**A. There is No Basis or Support for Apex’s Construction of
“Triggering the Transmission”**

Apex proposes construing “triggering the transmission” to mean “causing the transmission,” allegedly because the Petition reads out the word “triggering” and only focuses on “the transmission.” POR 11-13. But this is incorrect, and Apex’s construction fails for several reasons.¹

**1. Apex fails to provide a legitimate basis for swapping out
“triggering” with “causing”**

Apex asks the Board to effectively swap out the word “triggering” for “causing,” but it fails to explain why the metes and bounds of the term “triggering” are not already clear or why the term otherwise needs to be construed. Contrary to Apex’s assertion, the Petition does not read out the word “triggering.” In fact, the Petition explicitly addresses the claimed “triggering” when it states that “*Liu* discloses that a detection of a beam failure *triggers* transmission of the first and second BFRs (‘first radio signal’ and ‘second radio signal’) to the base station.” Petition 23-24 (emphasis added) (citing *Liu*, [0005], [0078], [0084], [0114]; *Liu Provisional*, [0004], [0056], [0062], [0090]); Ex. 1002 (“Bims”), ¶99. The Petition

¹ Despite Samsung’s Petition being filed long before the related district court proceeding’s claim construction phase, Apex never raised this construction in district court. *See* Ex. 1024.

further cites to *Liu*'s disclosure of measuring "the channel quality" of a reference signal to determine when to trigger the transmission of the first and second BFRRs. Petition 24; *Liu*, [0069], [0076]-[0077], [0087], [0091]; *Liu Provisional*, [0047], [0054]-[0055], [0091]; Bims ¶99.

Not only do Apex and its expert completely ignore this analysis, but they also completely ignore *Liu*. POR 26-27. Apex attacks *Jover* individually for its threshold condition allegedly "not [being] used for triggering a transmission of the first and second radio signal." *Id.* But this argument ignores the teachings of *Liu* and the combination proposed in the Petition. Specifically, as discussed above, and in Section II.B below, *Liu* already discloses detecting a beam failure triggers transmission of the first and second BFRRs. Petition 23-24.

Moreover, Apex's argument is essentially about a purported missing claim element, and the Board need not construe this term to resolve the dispute between the parties. Apex thus fails to provide a legitimate basis for swapping out the word "triggering" with "causing" in the claims.

2. Apex cannot point to any evidence to support its construction

Apex does not cite any intrinsic evidence to support its construction because, as Apex admits, a POSITA "would understand that the patent specification points to no specific meaning of the word 'triggering' other than the plain and ordinary meaning of the term." POR 12.

Apex thus resorts to extrinsic evidence, citing two purported dictionary definitions and the conclusory testimony from its expert. *Id.*, 12-13; Ex. 2005, ¶¶34-35. But neither constitutes evidence supporting its construction. The purported dictionary definitions are not evidence in this case because they have not been filed as exhibits as required by Rule 42.63. Moreover, the purported dictionary definitions are undated and unauthenticated. Indeed, they appear to be links to present day websites, which are not proof of how a POSITA would have understood “triggering” at or around 2017.

Moreover, the conclusory testimony of Apex’s expert should be given no weight because it simply parrots the Patent Owner Response and the two purported dictionary definitions (*see* Ex. 2005, ¶¶34-35), and does not provide any additional support for Apex’s construction.

B. *Liu* Discloses the “Triggering” Limitation, Regardless of Whether Apex’s Construction is Applied

While the Board should reject Apex’s construction of “triggering the transmission” for at least the reasons above, *Liu* discloses this limitation, regardless of whether the Board were to accept Apex’s construction.

Claim 1 requires “wherein a measurement for the target radio signal obtains a target measurement value, the target measurement value, when higher than a target threshold is used for triggering the transmission of the first radio signal and the second radio signal,” but Apex’s attack is only directed to the “triggering the

transmission” part of this limitation. POR 26-27. The Petition shows *Liu* discloses that detecting a beam failure triggers the transmission of the first and second beam failure recovery requests. Petition 23-24 (citing *Liu*, [0005], [0078], [0084], [0114]; *Liu Provisional*, [0004], [0056], [0062], [0090]); Bims, ¶99.

Contrary to Apex’s assertion, there are numerous examples where *Liu* establishes causality between detecting a beam failure and transmitting the first and second radio signals (e.g., the first and second BFRRs). For example, paragraph [0005] contemplates “sending a beam failure recovery request (BFRR) to the base station upon detection of a beam failure between the base station and the user equipment.” *Liu*, [0005], [0114]; *Liu Provisional*, [0004], [0090]. Paragraph [0084] also explains that, “[i]n order for the system to recover from such a beam failure, the user equipment 404 sends a beam failure recovery request (BFRR) to the base station 402.” *Liu*, [0084]; *Liu Provisional*, [0062].

Paragraph [0099] further states that, in some embodiments, “the user equipment 404 may transmit multiple BFRRs.” *Liu*, [0099]; *Liu Provisional*, [0074]. FIG. 5B below depicts one such embodiment.

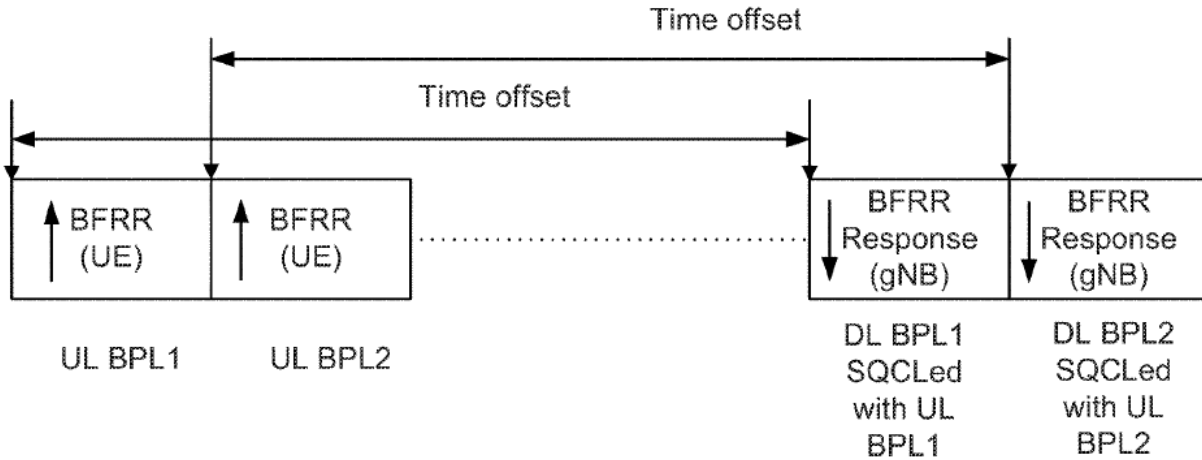


FIG. 5B

Liu, FIG. 5B; *Liu Provisional*, FIG. 5B.

Thus, instead of triggering a single BFRR, *Liu* discloses that multiple BFRRs may be triggered in response to the beam failure detection.

Additional examples also confirm *Liu*'s disclosure of causality between detecting a beam failure and transmitting the first and second radio signals (e.g., the first and second BFRRs). Claim 1 states "sending a beam failure recovery request (BFRR) to a base station upon detection of a beam failure between the base station and the user equipment"; claim 5 states "upon detection of the beam failure, the BFRR is sent using a physical uplink control channel (PUCCH)"; and claim 7 states "upon detection of the beam failure, the BFRR is sent using a physical random access channel (PRACH) or a PRACH-like channel." *Liu*, claims 1, 5, 7; *Liu Provisional*, claims 1, 6, [0069].

Further, as shown below in FIG. 6A, *Liu* depicts a flow chart, where “when a beam failure is detected by the user equipment 110A-110C, the user equipment 110A-110B sends a beam failure recovery request (BFRR) to the servicing base station 170A-170B.” *Liu*, [0103]; *Liu Provisional*, [0078].

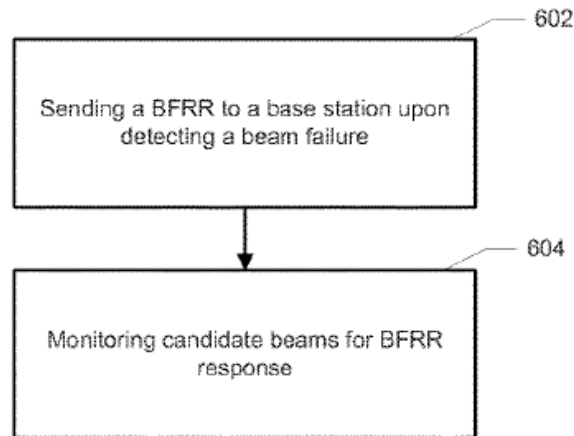


FIG. 6A

Liu, FIG. 6A; *Liu Provisional*, 6A.

Thus, *Liu* alone establishes causality between detecting a beam failure and transmitting the first and second radio signals.

Apex’s attacks against *Jover* for purportedly “not [being] used for triggering a transmission of the first and second radio signal” (POR 26-27) are misplaced because *Liu* already discloses these features. The Petition relies on *Jover* for its teachings of a triggering condition with a predetermined threshold. Petition 23-24. Apex does not argue that this part of the claim limitation is missing from the

proposed combination, and thus, for the same reasons above, *Liu* in combination with *Jover* renders obvious this limitation.

Finally, even if Apex’s proposal to swap out the word “triggering” with “causing” was adopted by the Board, it would not change the outcome. For the same reasons discussed above, *Liu* discloses that detecting a beam failure *causes* the transmission of the first and second radio signals (e.g., the first and second BFRRs). Petition 23-24; Bims, ¶99; *Liu*, [0005], [0078], [0084], [0099], [0103], [0114], claims 1, 5, 7, FIGS. 5B, 6A; *Liu Provisional*, [0004], [0056], [0062], [0069], [0074], [0078], [0090], claims 1, 6, FIGS. 5B, 6A.

III. Apex’s Different “Time Window” Constructions are Incorrect and Irrelevant to the Outcome

The Board should reject Apex’s different constructions for each of the first, second, and third “time window[s]” because they lack support and merit. But, even if the Board were to accept Apex’s constructions, they would not affect the outcome because *Liu* still discloses each of the “time window” limitations under Apex’s constructions.

A. Apex’s Different Constructions of the “Time Window” Limitations Lack Support and Merit

Apex proposes construing each of the “first time window,” “second time window,” and “third time window” separately and differently, as follows:

“first time window”: a period of time from the first radio signal in which to receive a third radio signal (*i.e.*, a response to either the first or second radio signals)

“second time window”: a period of time from the first radio signal in which to transmit the second radio signal

“third time window”: a period of time from the second radio signal in which to receive a third radio signal (*i.e.*, a response to either the first or second radio signals)

POR 13-17. Each of these constructions fails for several reasons.

1. Apex’s “time window” constructions are inconsistent with its district court construction.

As an initial matter, Apex’s constructions for these “time window” limitations are different than and inconsistent with the construction that it proposed for “time window” in the related district court proceeding: “the time allocated to respond to a signal request.” *Compare* POR 13-17 *with* Ex. 1024, 38-41. Apex fails to explain its notable shift in claim construction positions, let alone explain how these positions are consistent.

2. Apex’s “time window” constructions flout the law.

Apex’s constructions also fail because they flout the law. For example, it is well established that the same claim terms should be construed in the same manner. *See, e.g., Digital Biometrics, Inc. v. Identix, Inc.*, 149 F.3d 1335, 1345

(Fed. Cir. 1998); *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed. Cir. 2001); *Phonometrics, Inc. v. N. Telecom Inc.*, 133 F.3d 1459, 1465 (Fed. Cir. 1998); *Acromed Corp. v. Sofamor Danek Grp., Inc.*, 253 F.3d 1371, 1381-82 (Fed. Cir. 2001). Apex’s different constructions for each of the first, second, and third “time window[s]” are anything but consistent and only create more confusion. Each use of the term “time window” should instead be interpreted to have the same meaning.

Moreover, in support of Apex’s constructions, Apex cites the alleged “purpose” of the time windows. POR 14-17, 29. But the intended purpose of a particular claim limitation carries no patentable weight. *See, e.g., Toshiba Corp. v. Imation Corp.*, 681 F.3d 1358, 1368 (Fed. Cir. 2012); *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1218 (Fed. Cir. 2014); *Woods v. DeAngelo Marine Exhaust, Inc.*, 692 F.3d 1272, 1285 (Fed. Cir. 2012). Apex’s attempt to read the alleged “purpose” of each time window into the claims is thus improper.

Finally, Apex relies heavily on other claim elements to craft its proposed constructions. But those other elements already provide limitations on the claim, and thus, it is not necessary or proper to construe another claim term to repeat these same limitations. *See, e.g., Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1237 (Fed. Cir. 2016); *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1327 (Fed. Cir. 2005) (en banc).

The problem with Apex repeating other parts of the claim in its “time window” constructions is that it twists the meaning beyond what those other parts require. For example, although no claim element requires it, Apex defines each time window as having a specific purpose, e.g., to transmit or receive a particular radio signal in its respective time window. POR 13-14. There is no support in the claims or specification for this interpretation. And the Board should reject Apex’s attempt to rewrite the claims under the guise of claim construction.

3. Apex’s “time window” constructions improperly stray from the plain and ordinary meaning

Notwithstanding the inconsistencies and legal flaws above, Apex’s constructions for the “time window” limitations improperly stray from the plain and ordinary meaning. “[T]he words of a claim are generally given their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312 (quotations omitted). The only exceptions are lexicography or disavowal. *Thorner v. Sony Comput. Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). Neither exception applies here.

Apex concedes that “[a] person of ordinary skill in the art would understand that each of the claimed time windows are ‘a period of time.’” POR 14. But rather than stopping at the plain and ordinary meaning, Apex injects different language into each of the “time window” limitations according to their alleged “purpose” and allegedly so that “the other elements of the claim can be met.” *Id.*, 14-17, 29.

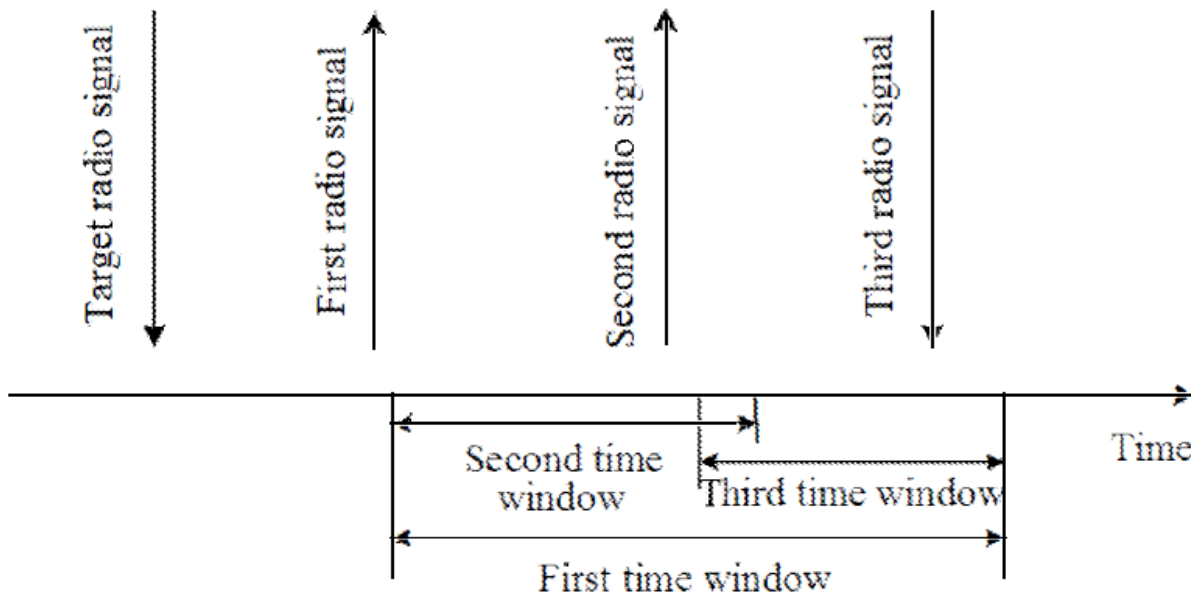
Apex cites to a statement from Dr. Bims' deposition and a purported dictionary definition (which is not evidence in this case because it has not been filed as an exhibit as required by Rule 42.63). POR 14. However, neither Dr. Bims' statement nor the purported dictionary definition ties the term "time window" to the transmission or receipt of particular radio signals, as Apex proposes. Instead, Dr. Bims' statement that "[a] time window as shown in Figure 6 is a period of time on the time axis," and the definition of "window" as "[a] time interval during which an activity may take place [or] a time interval during which an activity must take place" are consistent with the plain and ordinary meaning of "time window."² *Id.*

As shown below, Apex further cites to various non-limiting examples from the specification to advance its proposed constructions. But Apex does not cite any lexicography or clear disavowal to support departing from the plain and ordinary meaning of "time window." Thus, each "time window" construction fails.

² In the related district court proceeding, Samsung proposed construing "time window" in accordance with its plain and ordinary meaning, as "one or more intervals of time." Ex. 1024, 38. This is consistent with a "time window" being "a period of time," which Apex agrees is the plain and ordinary meaning.

a. “First Time Window”

To support its construction of “first time window,” Apex cites to the embodiment in FIG. 6, the claim language, and a portion of the Background section (’113 patent, 1:43-52). POR 14-16. None of these citations support Apex’s construction. As illustrated below, FIG. 6 does not support Apex’s construction because it shows the “first time window” starts a period of time after the “first radio signal” and extends a period of time beyond the “third radio signal.”



’113 patent, FIG. 6.

Further, the claim language “monitoring a third radio signal in a first time window” describes something that happens during the first time window, but it does not mandate that the first time window be defined as “a period of time allocated in order to receive a response to the signal requests of the first and second

radio signals, where the response is indicated by the monitored third radio signal,” as Apex suggests. POR 15. Finally, the passage from the background section merely discloses the purported “problems” that the ’113 patent attempts to solve and, as such, is not defining what is claimed. *See* ’113 patent, 1:53-54. At most, this passage refers to an exemplary time window as indicated by the use of the word “of”: “time window of” *Id.*, 1:43-52.

b. “Third Time Window”

Apex alleges that the “third time window” is related to the first time window because “it is a portion of the first time window starting from the second radio signal in which to receive a third radio signal,” and cites only to language in the claims to support its allegation. POR 16. But nothing in the limitation “a time domain resource occupied by the second radio signal is used for determining a third time window, and the end time of the third time window is the end time of the first time window” mandates Apex’s construction. Further, as with the “first time window,” FIG. 6 does not support Apex’s construction because it shows the “third time window” starts a period of time after the “second radio signal” and extends a period of time beyond the “third radio signal.”

c. “Second Time Window”

Apex alleges that the “second time window” “has a different function than the first and third time windows,” and cites to the embodiment in FIG. 6, the claim

language, and other non-limiting examples in the specification (22:56-60, 22:53-54) to support its construction. POR 16-17. None of these citations support Apex's construction. As with the first and third time windows, FIG. 6 does not support Apex's construction because it shows the "second time window" starts a period of time after the "first radio signal" and extends a period of time beyond the "second radio signal." Further, the passage at 22:56-60 does not mention "a second time window" at all, and thus, it does not support Apex's construction.

Apex also argues that the "second time window" is defined as "the period of time from the first radio signal in which to receive the second radio signal because it explicitly states that '[the]/[a] time domain resource occupied by the second radio signal is within the second time window.'" POR 17 (citing '113 patent, 22:53-54, claim 1). But the fact that a time domain resource occupied by the second radio signal happens to be within the second time window does not necessarily mean the purpose of the second time window is to transmit the second radio signal. Neither the specification nor claims limits the "second time window" in terms of the "second radio signal," let alone requires that it be defined as "the period of time from the first radio signal in which to transmit the second radio signal." The claim simply requires that "a time domain resource occupied by the second radio signal is within the second time window," and nothing more.

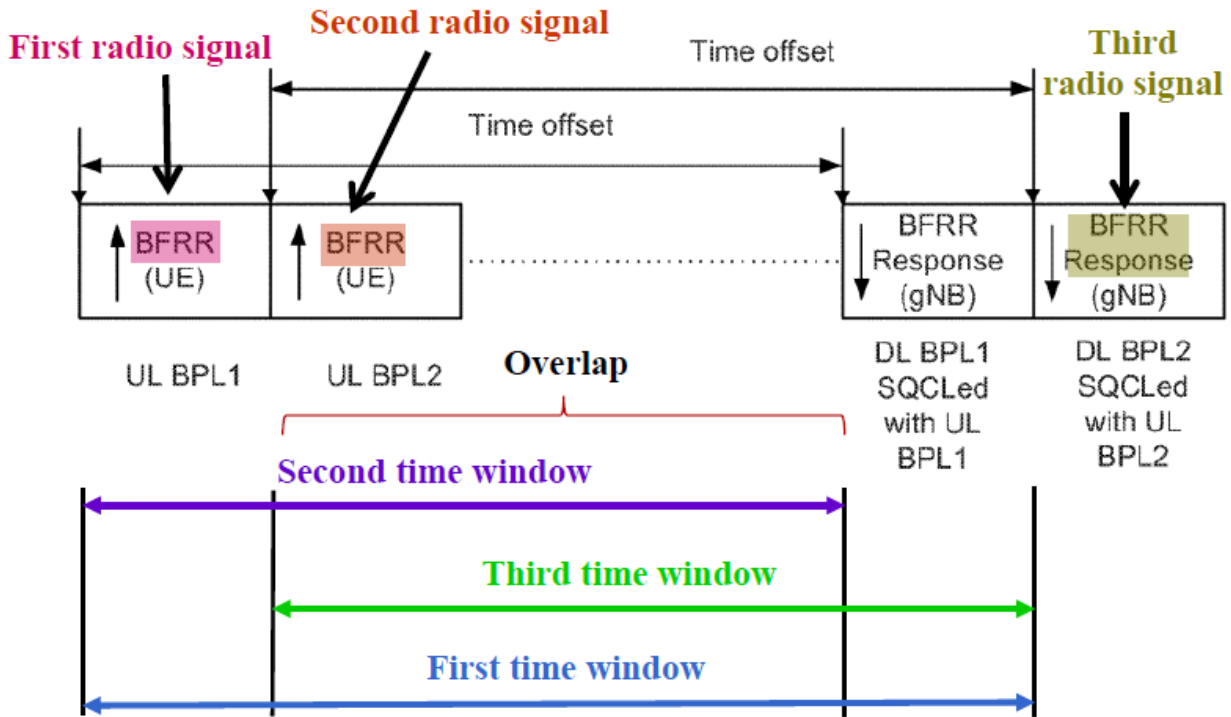
For these reasons, the Board should reject Apex’s “time window” constructions.

B. *Liu* Discloses the “Time Window” Limitations, Regardless of Whether Apex’s Constructions Are Applied

Although Apex proposes construing each of the first, second, and third time windows, it only argues that *Liu* fails to disclose the claimed “second time window.” POR 28-29. Apex does not dispute that *Liu* discloses the “first time window” or the “third time window” even under its proposed constructions. *Id.*

Apex argues that “the purpose of a second time window is ensuring that the second radio signal is transmitted within a certain period of time from the first radio signal which overlaps with the period of time from the second radio signal to receive a responsive third radio signal.” *Id.*, 29. While the Board should reject Apex’s construction of the “second time window” (as well as the “first time window” and the “third time window”) for the reasons above, *Liu* discloses this limitation, regardless of whether the Board were to accept Apex’s construction.

Applying the plain and ordinary meaning, where a “time window” is a “period of time,” the Petition shows that *Liu* meets the claimed “second time window,” as depicted in annotated FIG. 5B below. Petition 29-33.



Liu, FIG. 5B (annotated); *Liu Provisional*, FIG. 5B.

Apex does not dispute this. Rather, Apex’s entire argument depends on its erroneous claim construction of “second time window” discussed above.

Even if the Board were to accept Apex’s construction of “second time window,” *Liu* still discloses this limitation. As shown in annotated FIG. 5B above, *Liu* discloses a period of time (the depicted time offset for the first BFRR) from the first radio signal (first BFRR) in which to transmit the second radio signal (second BFRR). Apex’s argument about the possibility that the “second radio signal” in *Liu* may be received outside of the “second time window” (POR 16-17, 29) is beside the point because *Liu* explicitly discloses an embodiment in FIG. 5B that meets the limitations of the claim under Apex’s proposed construction.

To the extent Apex were to argue that the purpose of *Liu*'s second time window is to receive the first BFRR response (and not to transmit the second BFRR), this is irrelevant because Apex's construction does not include such language.

IV. *Liu* Discloses or Renders Obvious Transmitting Two Radio Signals on Two Channels

Apex argues that *Liu* does not teach “transmitting a second radio signal on a second channel,” allegedly because “Petitioner relies on the same signal sent twice over the same channel to meet the first signal and second signal limitations.” POR 20. But, as the Board recognized at Institution in the related IPR2023-00601 proceeding, “[t]he plain language of claim 1 does not specify the content of the two recited signals and thus does not appear to limit the first and second radio signals to different content.” IPR2023-00601 Paper 11, 17-18. Regardless, *Liu* discloses or renders obvious this limitation in claim 1 as well as claim 3.

Liu discloses transmitting two radio signals: “the user equipment 404 may transmit **multiple** BFRRs.” *Liu*, [0099] (emphasis added); *Liu Provisional*, [0074]. FIG. 5 below depicts these “two simultaneous transmissions.” *Id.* Indeed, Apex concedes this, alleging that “*Liu* sends the BFRR **radio signals** on the same channel.” POR 21 (emphasis added).

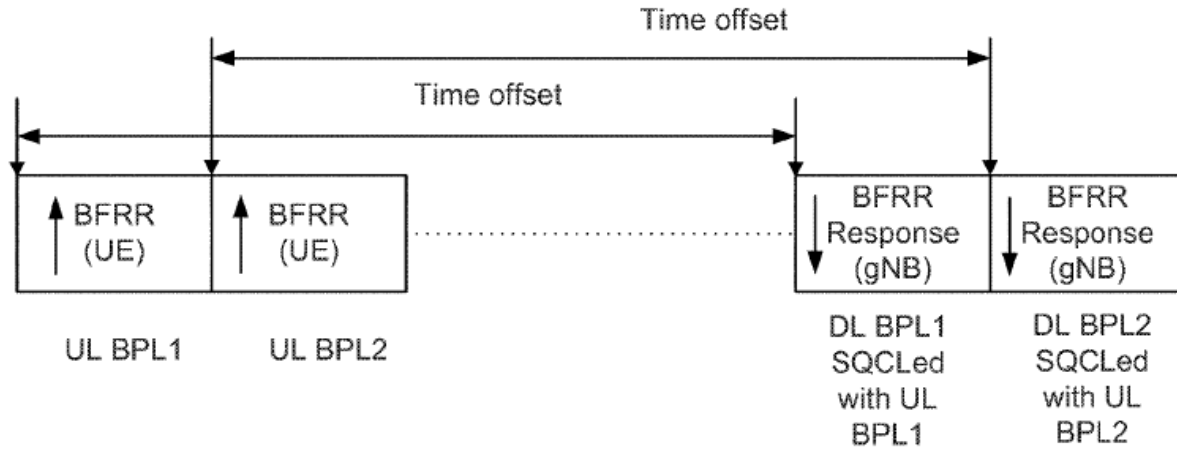


FIG. 5B

Liu, FIG. 5B; *Liu Provisional*, FIG. 5B

Liu further discloses using two different channels (e.g., PUCCH and PRACH) “for beam failure recovery request transmission.” *Liu*, [0004], [0084], [0092]; *Liu Provisional*, [0003], [0062], [0069]. *Liu* also specifically contemplates transmitting one BFRR signal on the PUCCH and another BFRR signal on the PRACH by first stating “[i]n one embodiment, when only the DL beam has failed (FIG. 4A), the user equipment 404 may use the active PUCCH (originally allocated for UCI) to report the beam failure and request recovery from the base station 402,” and then stating “[i]n still another embodiment, when the DL and UL beams have failed, the user equipment 404 **may also attempt to use** the PRACH or PRACH-like channel for BFRR.” *Liu*, [0084]; *Liu Provisional*, [0062]. Thus, as the Petition shows, a POSITA would have understood that *Liu* alone discloses

transmitting two radio signals (two BFRRs) on two different channels (PUUCH and PRACH). Petition 18-20; Bims, ¶¶84-90.

Apex further argues “[i]t would not be obvious at all to modify the system of *Liu* to have one BFRR sent by PUCCH and one sent by PRACH because the disclosed advantage of *Liu* is sending multiple beam pairs (transmitting and receiving beams) on the same channel to determine the best beam pair from all possible beam pairs for maximum beamforming efficiency on that specific channel, as indicated by the patent specification of *Liu*.” POR 22 (citing *Liu*, [0004]). But the Board already rejected this same argument at Institution, recognizing that paragraph [0004] of *Liu* “refers to using multiple channels, not a single channel, for beam failure recovery,” which “undercut[s] Patent Owner’s position.” Paper 11, 19-20. The part in paragraph [0004] emphasized by Apex simply states “beam alignment in mm-wave communication systems is necessary to find the best beam pair from all possible beam pairs for maximum beamforming efficiency,” but says nothing about the use of a single channel. Apex does not otherwise argue that *Liu* teaches away from the proposed combination or that it would render *Liu* inoperable for its intended purpose. Further, the conclusory testimony of Apex’s expert adds nothing and should be given no weight, as it simply parrots Apex’s argument above.

Apex further disputes that it would have been a straightforward modification, arguing that “several design modifications would have to be made that would require a level beyond that of a person of ordinary skill in the art.” POR 23. But as discussed above, *Liu* itself already discloses using two radio signals and two channels. And, as Dr. Bims testified, and the Board agreed at Institution, it would have been a matter of simple design choice to use both channels to transmit the two radio signals. Bims, ¶126; Paper 11, 19-20.

When pressed at his deposition about the proposed modification, Dr. Bims gave multiple examples of hardware and software changes that would allow the system in *Liu* to transmit its two BFRRs on two different channels (PUUCH and PRACH). Ex. 2006, 66:17-73:14 (e.g., explaining that this modification could be implemented by “add[ing] additional logic gates that would redirect the message to the PRACH circuitry,” or that “something as simple as changing the function that gets called to transmit the message” may be all that is required to implement this modification). Apex alleges that “Petitioner’s expert was unable to name or describe such a function with specificity.” POR 24. But Dr. Bims did describe the function that could be modified: “what would be required is a modification to the source code that would send the information on the PUCCH to instead designate the information be sent on the PRACH.” Ex. 2006, 69:22-70:9. And he was never asked about the “name” of the function, nor was it required. *Samsung Elecs. Co.*,

App. No. 2022-1127, 2023 WL 2003932, at *2 (Fed. Cir. Feb. 15, 2023)

(explaining that “once the function to be performed by software has been identified, writing code to achieve that function is within the skill of the art”).

Apex alleges these changes would have been beyond the skill of a POSITA and that they would not have been obvious, citing only its expert’s conclusory opinions. POR 24-26 (citing Ex. 2005, ¶¶51-52). Apex’s expert provides no support for his opinion that the modifications would require “deep technical expertise.” He also refers to “Petitioner’s expert’s inability to articulate design implementations with specificity” (*id.*), despite Dr. Bims providing numerous examples of design implementations, none of which Apex’s expert addresses.

Apex’s expert further argues that a POSITA would not have known to use both PUCCH and PRACH channels and would have only used one of the two channels. Ex. 2005, ¶52. But this ignores *Liu*’s own teachings of using both PUCCH and PRACH channels for beam failure recovery request transmission. *Liu*, [0004], [0084], [0092]; *Liu Provisional*, [0003], [0062], [0069].

Finally, Apex’s expert argues that a POSITA “would have found that the ’113 patent teaches a different mechanism than *Liu* because the ’113 Patent is trying to solve a resource utilization problem in a different way (i.e., transmitting a beam recovery request on a different channel than another beam recovery request within a common time window) than envisioned by the conventional systems, such

as *Liu*.” Ex. 2005, ¶52 (citing ’113 Patent, 1:43-54.). But Apex’s expert points to nothing in *Liu* that suggests it is not also trying to solve a resource utilization problem. Further, even if the ’113 patent were attempting to solve a different problem than *Liu*, this alone does not defeat the Petition’s motivation to combine. *See* Paper 11, 20 (citing *Allied Erecting v. Genesis Attachments*, 825 F.3d 1373, 1381 (Fed. Cir. 2016); *see also Tyco Healthcare Grp. LP v. Ethicon Endo-Surgery, Inc.*, 774 F.3d 968, 977 (Fed. Cir. 2014) (“the prior art need not address the exact problem that the patentee sought to resolve”). This is particularly true here, where Apex and its expert fail to even address the motivations set forth in the Petition. Petition 37 (e.g., the use of different channels for the first and second BFRs would “ensure greater reliability of the base station’s response”); Bims, ¶127.

V. Apex’s Teaching Away Argument for Ground 2 Fails

Apex argues that there is no motivation to combine *Liu* with *Jover* because “*Jover* is directed to the opposite objective of the ’113 Patent or *Liu*.” POR 30-32. Specifically, Apex argues that the “beam steering and null generation” and “beam sweeping” described in *Jover* “teaches away from the methods related to Beam Recovery Requests disclosed in the ’113 Patent.” *Id.* This argument falls flat, however, because there is nothing in *Jover* that explicitly teaches away from the use of beam recovery requests. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004).

As the Petition explains, both *Liu* and *Jover* are “directed to detecting a communication failure between the UE and the base station.” Petition 25 (citing *Liu*, [0005], [0069], [0076]-[0078], [0084], [0087], [0091], [0114], FIG. 1; *Liu Provisional*, [0004], [0047], [0054]-[0056], [0062], [0090], FIG. 1; *Jover*, [0039]-[0040], FIG. 3). *Jover* does not mention beam recovery requests, let alone teach away from them. At most, *Jover* teaches alternative methods of resolving communication failures between a UE and a base station through the use of beam steering/null generation and beam sweeping. *In re Fulton*, 391 F.3d at 1201.

Moreover, Apex’s argument ignores that the proposed combination of *Liu* and *Jover* in the Petition relies on *Jover* for its teachings of a specific triggering condition (i.e., condition where a value is higher than a target threshold). See Petition 24-27. The proposed combination does not propose bodily incorporating the beam steering/null generation or beam sweeping techniques of *Jover*. Thus, Apex’s argument amounts to requiring bodily incorporation and “attacking references individually,” as the Board acknowledged at Institution. Paper 11, 29. The Board should reject Apex’s teaching away argument for at least these additional reasons.

VI. Apex’s Arguments Against the Other Claims Similarly Fail

Apex argues claims 2-20 are not unpatentable for the same reasons discussed above. POR 29-30. Thus, Apex’s arguments for these claims fail for at least the

reasons in Sections II-V of this paper. As explained in the Petition, *Liu* and *Jover* render obvious claims 2-20.

VII. The Board Should Give Mr. Gomez's Declaration No Weight

The Board should give no weight to the testimony of Mr. Gomez because he does not qualify as a POSITA. In the Petition, Samsung proposed that a POSITA “would have had at least a master’s degree in electrical engineering or a similar field and at least two years of experience working with telecommunications systems, including multiple-input multiple-output (MIMO) technology.” Petition 13. Apex’s expert does not meet this definition because he only has a bachelor’s degree in electrical engineering, and no work experience with MIMO technology. Indeed, Mr. Gomez’s CV is silent with respect to any work experience with MIMO technology. When asked about his work experience with MIMO technology in the related district court proceeding, he could not point to any specific work experience. Ex. 1025, 51:10-52:3. Mr. Gomez also admitted “I haven't actually specifically built a product related to those technologies.” *Id.*, 52:2-3.

Implicitly acknowledging that Apex’s expert does not meet Samsung’s definition of a POSITA, Apex proposed a different definition that leaves out the requirement for experience with MIMO technology and provides an alternative with only a bachelor’s degree and more work experience. POR 17-18. Apex’s definition is wrong because the ’113 patent purports to address a MIMO problem

in 5G. '113 patent, 1:23-54 (3GPP New Radio is commonly understood to mean 5G). Indeed, Apex asserts that the patent is related to 5G technologies. Ex. 1017, 5 (asserting patented technology is implemented in 5G products); *see also* '113 patent, 14:48 (disclosing 5G embodiment). Thus, telecommunications experience alone (without MIMO experience) is not enough. Samsung's definition is thus more in line with the claimed invention and specification of the '113 patent.

Regardless, it is questionable whether Apex's expert meets his own definition of a POSITA. Because Mr. Gomez does not have a master's degree, he must have had at least five years of experience working with telecommunications systems to meet Apex's proposed definition. But Mr. Gomez did not identify whether and when he had such experience. And, in any case, Mr. Gomez has admitted that any such experience is not in the 5G technology of the '113 patent, let alone 4G or even 3G. According to Mr. Gomez's testimony in the related district court proceeding, only two of his engineering experiences involved wireless networking: his work for Philips (February 1997-December 1999) and ActSolar (August 2006-March 2009). Ex. 1025, 47:14-48:11; Ex. 2005, Ex. A, 3, 5. His testimony about this work experience makes clear that it only tangentially involved wireless networking, at best. *See* Ex. 1025, 33:4-35:23, 38:17-39:25.

In addition, Mr. Gomez admitted that none of his engineering experiences involved 5G, much less 4G or even 3G. *Id.*, 50:2-51:9. His work for Phillips

involved 2G cellular network communications and “local-area-network-type technologies,” and the work for ActSolar involved “transmission of data from the rooftops down to” nearby receivers “using a protocol called Zigbee.” *Id.*, 47:25-48:22. Thus, Mr. Gomez’s lack of practical experience related to 4G/LTE and 5G (or even 3G) highlights his lack of credentials. His only practical experience involving cellular wireless communications (Philips) ended nearly two decades before the claimed priority date of the ’113 patent.

Unlike Mr. Gomez, Samsung’s expert, Dr. Bims, meets the definition of a POSITA under either Samsung or Apex’s definition of a POSITA. *See* Bims, Appendix A; Ex. 2006, 16:7-26:22. Dr. Bims’ testimony is thus more credible and should be given more weight than Mr. Gomez’s testimony.

VIII. Conclusion

For these reasons and those in the petition, the challenged claims should be canceled.

Dated: March 19, 2024

By: /Joshua L. Goldberg/
Joshua L. Goldberg, Lead Counsel
Reg. No. 59,369

CERTIFICATION OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, Petitioner certifies that the word count of Petitioner's Reply (exclusive of any table of contents, table of authorities, mandatory notices under §42.8, certificates of service and word count, and list of exhibits or claim listing) as measured by Microsoft Word is 5,585.

Dated: March 19, 2024

By: /Joshua L. Goldberg/
Joshua L. Goldberg, Lead Counsel
Reg. No. 59,369

CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the foregoing **Petitioner's Reply** was served electronically via email on March 19, 2024, in its entirety on the following:

Vincent J. Rubino, III
Peter Lambrianakos
Enrique W. Iturralde
FABRICANT LLP
411 Theodore Fremd Avenue,
Suite 206 South
Rye, New York 10580
vrubino@fabricantllp.com
plambrianakos@fabricantllp.com
eiturralde@fabricantllp.com
ptab@fabricantllp.com

Patent Owner has consented to service by email.

Dated: March 19, 2024

By: /William Esper/
William Esper
Case Manager and PTAB Coordinator
Finnegan, Henderson, Farabow,
Garrett & Dunner, LLP