

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TCL COMMUNICATION TECHNOLOGY HOLDINGS LIMITED,
TCT MOBILE INTERNATIONAL LIMITED,
TCT MOBILE, INC.,
TCT MOBILE (US) INC., and
TCT MOBILE (US) HOLDINGS INC.,
Petitioner,

v.

MITSUBISHI ELECTRIC CORPORATION,
Patent Owner.

IPR2023-00957
Patent 9,635,656 B2

Before NORMAN H. BEAMER, SEAN P. O'HANLON,
and MICHAEL T. CYGAN, *Administrative Patent Judges*.

BEAMER, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

On June 2, 2023, TCL Communication Technology Holdings Limited, TCT Mobile International Limited, TCT Mobile, Inc., TCT Mobile (US) Inc., and TCT Mobile (US) Holdings Inc. (collectively, “Petitioner”) filed a Petition pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of claim 3 of U.S. Patent No. 9,635,656 B2 (“the ’656 patent”). Paper 2 (“Pet.”), 1. On September 14, 2023, Mitsubishi Electric Corporation (“Patent Owner”) filed a Preliminary Response (“Prelim. Resp.”). Paper 6.

The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted unless the information presented in the Petition and any preliminary response shows that “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” *See* 37 C.F.R. § 42.108 (2022).

For the reasons explained below, we determine that Petitioner has established a reasonable likelihood that it would prevail with respect to the challenged claim. Accordingly, we institute an *inter partes* review as to the challenged claim and grounds raised in the Petition.

II. BACKGROUND

A. *The ’656 Patent*

The ’656 patent, titled “Data Communication Method, Communication System and Mobile Terminal,” was filed on December 31, 2014, is a continuation of an application filed December 27, 2006, references a foreign application filed October 27, 2006, and issued on April

25, 2017. Ex. 1001, codes (54), (22), (63), (30), (45), 1:8–15.¹ The '656 patent is directed to a communications system which complies with the Long-Term Evolution (LTE) standard, including a base station and a mobile terminal, in which the transmission of the Channel Quality Indicator signal CQI is stopped while the uplink scheduling request signal SR is transmitted. *Id.* at code (57), 16:7–21. The Channel Quality Indicator signal CQI is transmitted from the mobile terminal to the base station and represents the quality of the data received by the mobile terminal, or the quality of the downlink communication path, and the base station uses the CQI for downlink scheduling. *Id.* at 2:25–35, 2:42–46. The mobile terminal transmits the uplink scheduling request signal SR to the base station to make a request for allocation of uplink radio resources when the mobile terminal has data to transmit to the base station. *Id.* at 2:46–54.

The '656 patent explains:

By stopping the transmission of the . . . CQI signal while transmitting the uplink scheduling request signal SR, the mobile terminal does not have to use a multi carrier method with which to simultaneously transmit data associated with the two physical channels (the Ack/Nack exclusive channel and the S-RACH) which are allocated to two types of bands, respectively. Therefore, increase in the radio resources load on the communication system due to temporary increase in the physical channels can be prevented, and transmission with a single carrier method which guarantees a low PAPR [Peak to Average Power Ratio] can be implemented.

Ex. 1001, 18:44–54. As further explained, “as the PAPR becomes high, the power consumption of the mobile terminal increases and therefore the cell

¹ The parties assume the October 27, 2006, foreign application date is the effective priority date of the '656 patent. Pet. 18; Prelim. Resp. 4.

coverage becomes narrow [and the CQI and SR] signals become an interference wave to other mobile terminals and the communication system.” *Id.* at 7:39–44. These effects are avoided by transmitting CQI and SR in a single band. *Id.* at 7:45–51.

B. The Challenged Claim

Independent claim 3 is reproduced below.

3. A mobile terminal configured to:
 - transmit a quality notification signal for notifying down link communication quality to a base station, and
 - transmit a scheduling request signal with which to make a request for allocation of radio resources to said base station before transmitting transmission data to said base station, wherein said mobile terminal includes:
 - a transmitter configured to transmit said quality notification signal to said base station, and to transmit said scheduling request signal to said base station; and
 - a controller configured to perform a first control process that includes, when the mobile terminal has not been allocated a radio resource for transmitting said transmission data, transmitting said scheduling request signal to said base station, and a second control process that includes, when a transmission of said quality notification signal coincides with that of said scheduling request signal in said transmitter, stopping transmitting said quality notification signal during a time interval during which said transmitter transmits said scheduling request signal.

Ex. 1001, 72:20–40.

C. References

Petitioner relies on the following references (Pet. vii):

- Umesh et al., JP 2006-33778A (“UMESH”). Ex. 1010.
- 3GPP TS 25.309 V6.6.0 (2006-03) (“TS 25.309”). Ex. 1011.
- R1-060583. Ex. 1012.

Petitioner filed the Declaration of Mark R. Lanning in support of the Petition. Ex. 1003 (“Lanning Decl.”).

D. Asserted Challenges to Patentability

Petitioner challenges the patentability of claim 3 of the ’656 patent on the following bases (Pet. 12):

Claims Challenged	35 U.S.C. §²	References
3	103(a)	UMESH
3	103(a)	UMESH, TS 25.309
3	103(a)	UMESH, R1-060583

E. Real Parties in Interest

Petitioner identifies TCL Communication Technology Holdings Limited, TCT Mobile International Limited, TCT Mobile, Inc., TCT Mobile (US) Inc., and TCT Mobile (US) Holdings Inc. as real parties in interest.

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), included amendments to 35 U.S.C. §§ 102 and 103 that became effective on March 16, 2013. The ’656 patent was filed on December 31, 2014 and claims priority to an application filed in 2006, which is before the effective date of the aforementioned AIA provisions. *See* Prelim. Resp. 4. Therefore, we apply the pre-AIA versions of these sections.

Pet. 2. Patent Owner identifies itself and Sisvel International S.A. as real parties in interest. Paper 5, 2.

F. Related Proceedings

The parties identify *Mitsubishi Electric Corporation et al. v. TCL Communication Technology Holdings Limited et al.*, Case No. 8:22-cv-01073-GW-DFM (C.D. Cal.) (hereafter, the “California case”), as a related proceeding. Pet. 2; Paper 5, 2.

III. ANALYSIS OF PETITIONER’S CHALLENGE

A. Legal Standards

To prevail in its challenge, Petitioner must show a reasonable likelihood that at least one claim is unpatentable. 35 U.S.C. § 314(a). Under § 314, the Board is required to make a binary choice to institute review or not. *SAS Inst. Inc. v. Iancu*, 138 S.Ct. 1348, 1355 (2018). “In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said

subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective indicia of non-obviousness (also called secondary considerations), such as commercial success, long-felt but unsolved needs, and failure of others.³ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We analyze grounds based on obviousness in accordance with the above-stated principles.

B. Level of Skill in the Art

In determining whether an invention would have been obvious at the time it was made, 35 U.S.C. § 103(a) requires us to resolve the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* In a given case, one or more factors may predominate. *Id.*

Petitioner proposes that a person of ordinary skill in the art at the time of the alleged invention of the '656 patent:

[W]ould have had at least a degree in electrical engineering, computer engineering, computer science or a similar discipline,

³ The record does not include evidence or argument regarding objective indicia of nonobviousness.

with at least two years of relevant industry or research experience, including experience designing or implementing cellular networks. Additional work or research experience can substitute for less or different education, and vice versa. A person of ordinary skill in the art would also have had familiarity with the 3GPP technical standards.

Pet. 11 (citing Lanning Decl. ¶¶ 29–34). Patent Owner, citing its declarant Dr. Todor Cooklev, applies Petitioner’s proposed articulation. Prelim. Resp. 7 (citing Ex. 2001 (hereafter, “Cooklev Decl.”) ¶ 21).

Petitioner’s proposal is consistent with the level of ordinary skill in the art reflected by the asserted prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *GPAC*, 57 F.3d at 1579. On this record, the level of ordinary skill is neither in dispute nor dispositive of any challenge. For purposes of this Decision, we apply Petitioner’s articulation.

C. Claim Construction

The Petition was accorded a filing date of June 2, 2023. Paper 3. In an *inter partes* review for a petition filed on or after November 13, 2018, a claim “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).”

37 C.F.R. § 42.100(b). We apply the claim construction standard from *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (*en banc*).

Claim terms need only be construed to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

Petitioner submits that the Board should adopt several claim constructions. Pet. 13–17. Petitioner proposes that the claimed “quality notification signal” should be construed as the “Channel Quality Indication

(CQI) signal” that is referred to in the ’656 patent as “the quality information indicating the quality of the received data or the quality of the downlink communication path.” *Id.* at 13–15 (citing Ex. 1001, 2:25–35, 2:42–46).

Petitioner also proposes that the claim 3 condition, “when a transmission of said quality notification signal coincides with that of said scheduling request signal in said transmitter” be interpreted as “when said [quality notification signal] is transmitted by the transmitter simultaneously with the transmission of the scheduling request signal.” Pet. 15–16 (alteration in original). Petitioner relies on the statement in the ’656 patent that,

at the same time when the mobile terminal UE1 transmits the uplink scheduling request signal SR by using the S-RACH, the mobile terminal, in ST605, stops the transmission of a predetermined Ack/Nack symbol (or LB) of the uplink Ack/Nack exclusive channel or a CQI symbol (or LB), which the mobile terminal was originally scheduled to transmit at the same timing.

Pet. 15–16 (citing Ex. 1001, 16:7–21) (emphasis added by Petitioner).

Petitioner also relies on the statement, “there can be considered a case in which the transmission of the CQI using an Ack/Nack exclusive channel and an uplink scheduling request signal SR occur *simultaneously*.” *Id.* at 16 (citing Ex. 1001, 18:23–26) (emphasis added by Petitioner).

In addition, Petitioner proposes that the claim 3 conditional requirement, “stopping transmitting said quality notification signal during a time interval during which said transmitter transmits said scheduling request signal” be interpreted as “stopping the transmission of said [quality notification signal] during a time interval when the transmitter is also

transmitting said scheduling request signal.” Pet. 16–17 (alteration in original) (citing Ex.1001, 16:7–21, 18:37–54, 21:43–53).

Patent Owner argues that no construction is necessary for any of these portions of claim 3, but also refers to the claim construction ruling in the California case. Prelim. Resp. 6. In that ruling, the court construed “quality notification signal” as “a signal indicating either the quality of the received data or the quality of the downlink communication path.” Ex. 2002, 9. The court construed “when a transmission of said quality notification signal coincides with that of said scheduling request signal in said transmitter” as “when a transmission of said quality notification signal is scheduled to transmit or is transmitting at the same time as that of said scheduling request signal in said transmitter.” *Id.* at 12. In addition, the court construed “stopping transmitting said quality notification signal during a time interval during which said transmitter transmits said scheduling request signal” as “suspending transmission of said quality notification signal during a time interval during which said transmitter transmits said scheduling request signal.” *Id.* at 13.

We agree with Patent Owner that there is no need at this stage to construe “quality notification signal.” Although the “Channel Quality Indication (CQI) signal” of the LTE standard is an example of the quality notification signal, there is no basis for limiting that term to this specific example.

Likewise, we agree with Patent Owner that there is no need to construe the claim 3 conditional requirement, “stopping transmitting said quality notification signal during a time interval during which said transmitter transmits said scheduling request signal” beyond its plain and

ordinary meaning. This encompasses the court’s observation that this requirement is not limited to stopping an active transmission, but also includes stopping a scheduled transmission. Ex. 2002, 12–13.

However, regarding the claim 3 condition, “when a transmission of said quality notification signal coincides with that of said scheduling request signal in said transmitter,” we agree with the court’s construction in the California case: “when a transmission of said quality notification signal is scheduled to transmit or is transmitting at the same time as that of said scheduling request signal in said transmitter.” Ex. 2002, 12. The court rejected defendant’s (here Petitioner’s) equating “coincides” with “simultaneous” and relied on the statement in the ’656 patent that when the mobile terminal transmits the uplink scheduling request signal SR, the mobile terminal stops the transmission of a CQI symbol “which the mobile terminal was *originally scheduled to transmit at the same timing*.” *Id.* at 10 (citing Ex. 1001, 16:7–21) (emphasis added). As the court explained, “[t]his disclosure teaches temporarily preventing a scheduled transmission as opposed to stopping a transmission already in progress.” *Id.* at 11.

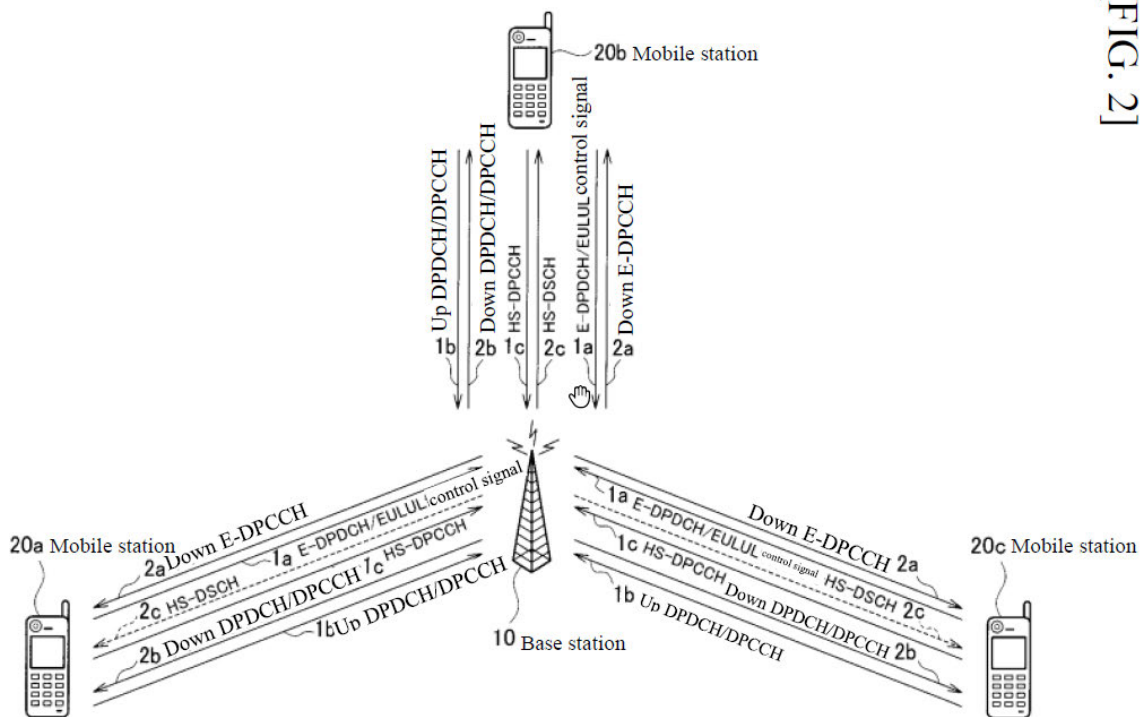
Therefore, for purposes of this Decision, we construe “when a transmission of said quality notification signal coincides with that of said scheduling request signal in said transmitter,” to mean “when a transmission of said quality notification signal is scheduled to transmit or is transmitting at the same time as that of said scheduling request signal in said transmitter.”

D. Alleged Obviousness of Claim 3 Over UMESH

Petitioner challenges claim 3 as obvious over UMESH. Pet. 25–36.

1. UMESH

UMESH, titled “Mobile Station, Base Station, Control Device, Mobile Communication System, and Mobile Communication Method,” was filed on August 11, 2004, claims priority to an application filed June 17, 2004, and was published on February 2, 2006. Ex. 1010, codes (54), (22), (32), (43).⁴ UMESH is directed to aspects of the 3GPP telecommunications standard in which a high-speed uplink physical control signal on an uplink physical control channel conforming to high-speed packet access (HS-DPCCH), and an EULUL control signal conforming to enhanced access, are transmitted from a mobile station to a base station by time-division multiplexing. *Id.* at code (57). Figure 2 is reproduced below.



[FIG. 2]

⁴ Exhibit 1010 is a certified English translation of UMESH. Exhibit 1024 is an original version.

Figure 2 depicts mobile stations 20a–20c communicating with base station 10 via uplink channels 1a–1c and downlink channels 2a–2c. Ex. 1010 ¶¶ 32–37. In particular, uplink channel DPDCH/DPCCH 1b transmits user data and ancillary control signals, uplink channel E-DPDCH/EULUL 1a performs enhanced transmission of user data and an EULUL (enhanced uplink) control signal, and uplink channel HS-DPCCH 1c is a dedicated physical control channel conforming to high-speed downlink packet access. *Id.* ¶¶ 34–36. Figure 4 is reproduced below.

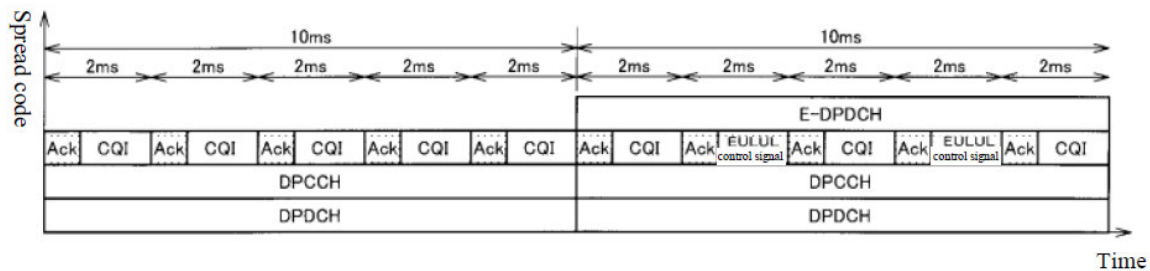


Figure 4 illustrates a frame format showing a transition from the left portion, when uplink channels DPDCH/DPCCH 1b and HS-DPCCH 1c, but not E-DPDCH/EULUL 1a, are transmitted, to the right portion, where all channels are transmitted. Ex. 1010 ¶ 45. Prior to the transition, the control signals in HS-DPCCH 1c are “Ack,” to indicate whether user data is received normally, and CQI (channel quality indicator), used to control downlink data transmission based on the downlink radio quality between the mobile stations and the base station. *Id.* ¶¶ 43–44. After transition, the EULUL control signal replaces the CQI control signal when needed. *Id.* ¶ 48 (“when a need arises to transmit the EULUL control signal, the mobile stations 20a to 20c transmit no channel quality indicator (CQI) in HS-DPCCH and perform transmission by replacing the channel quality indicator (CQI) with the EULUL control signal.”). A control unit in the

mobile station determines when the EULUL control signal replaces the CQI signal, such as at a set transmission interval. *Id.* ¶¶ 58–59. As stated in UMESH:

When a need to transmit the EULUL control signal arises, the radio control unit 23 sets the EULUL control signal in the CQI slot that normally sets the channel quality indicator (CQI) and instructs the radio unit 21 to transmit a high-speed uplink physical control signal on HS-DPCCH and the EULUL control signal by time-division multiplexing. That is, the radio control unit 23 instructs and controls the radio unit 21 so the EULUL control signal is transmitted in the CQI slot of HS-DPCCH.

Id. ¶ 58.

An example is illustrated in Figure 10, reproduced below.

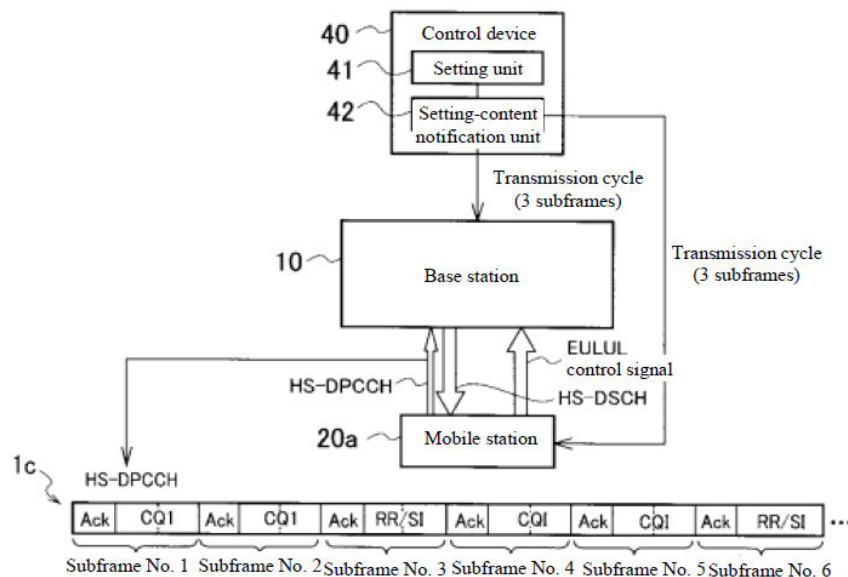


Figure 10 is an example in which the CQI transmission on HS-DPCCH 1c is stopped every three subframes and the EULUL control signal is transmitted in the CQI slot. Ex. 1010 ¶ 73 (“the radio control unit 23 of the mobile station 20a controls the radio unit 21 so CQI transmission on the HS-DPCCH 1c is stopped every three subframes and the EULUL control signal is transmitted in the CQI slot”). In this instance, EULUL control signal is

made up of RR (rate request)/SI (scheduling information), which is information necessary in enhanced access for the base station to calculate uplink radio resources to assign to the mobile station. *Id.* ¶ 75.

Another example is illustrated in Figure 11, reproduced below.

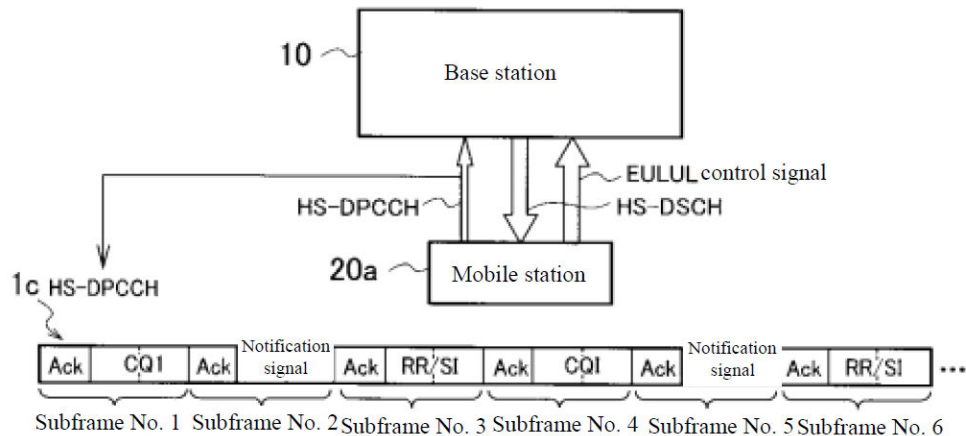


Figure 11 is an example in which a notification signal is transmitted prior to transmission of the EULUL control signal (again consisting of an RR/SI signal). Ex. 1010 ¶ 77.

2. Petitioner's Challenge

For the “mobile terminal” preamble of claim 3, Petitioner generally relies on the disclosure in UMESH of mobile terminals 20 in a mobile communications system.⁵ Pet. 25–26 (citing Ex. 1010, Fig. 1, ¶¶ 32, 55; Lanning Decl. ¶¶ 90, 120–121).

For the claim 3 requirement, “transmit a quality notification signal for notifying down link communication quality to a base station,” Petitioner relies on the disclosure in UMESH of the channel quality indicator (CQI)

⁵ For this Decision, we make no determination whether or not the preamble of claim 3 is limiting.

signal transmitted in the uplink channel HS-DPCCH 1c. Pet. 26–28 (citing Ex. 1010 ¶ 44; Lanning Decl. ¶¶ 91–96, 122–124).

For the claim 3 requirement, “transmit a scheduling request signal with which to make a request for allocation of radio resources to said base station before transmitting transmission data to said base station,” Petitioner relies on the disclosure in UMESH of the RR (rate request)/SI (scheduling information) signal transmitted in the uplink channel HS-DPCCH 1c. Pet. 28–30 (citing Ex. 1010 ¶ 75; Lanning Decl. ¶¶ 125–127). Petitioner argues that this UMESH disclosure would have taught or suggested that the scheduling request signal is transmitted to request allocation of radio resources to the mobile station. *Id.* (citing Lanning Decl. ¶¶ 125–132).

For the claim 3 requirement, “said mobile terminal includes . . . a transmitter configured to transmit said quality notification signal to said base station, and to transmit said scheduling request signal to said base station,” Petitioner relies on the disclosure in UMESH of a transmitter in the mobile terminals that transmits the channel quality indicator (CQI) and RR (rate request)/SI (scheduling information) signals. Pet. 30–32 (citing Ex. 1010, Fig. 7, ¶¶ 55–56, 58, 75; Lanning Decl. ¶¶ 134–136).

For the claim 3 requirement, “said mobile terminal includes . . . a controller configured to perform a first control process that includes, when the mobile terminal has not been allocated a radio resource for transmitting said transmission data, transmitting said scheduling request signal to said base station” (hereafter, “the first control process requirement”), Petitioner relies on the disclosure in UMESH of a radio control unit in the mobile terminals which, inter alia, controls the transmission of the EULUL control signal, including the RR (rate request)/SI (scheduling information) signal, in

the CQI slot of the uplink channel HS-DPCCH 1c. Pet. 32–33 (citing Ex. 1010, Fig. 7, ¶¶ 55, 57, 75; Lanning Decl. ¶¶ 96, 139–140). Petitioner further argues that one of ordinary skill would have understood that this control signal would have been transmitted to the base station when the mobile terminal had not been allocated a radio resource for data transmission, given the disclosure that RR (rate request)/SI (scheduling information) signal was transmitted for the purpose of the base station deciding uplink resources to assign to the mobile terminal. *Id.* at 33–34 (citing Ex. 1010 ¶ 75; Lanning Decl. ¶¶ 96, 130, 141).

For the claim 3 requirement,

said mobile terminal includes . . . a controller configured to perform . . . a second control process that includes, when a transmission of said quality notification signal coincides with that of said scheduling request signal in said transmitter, stopping transmitting said quality notification signal during a time interval during which said transmitter transmits said scheduling request signal

(hereafter, “the second control process requirement”), Petitioner relies on the disclosure in UMESH of a radio control unit in the mobile terminals which, inter alia, stops CQI transmission on the HS-DPCCH 1c channel every three subframes and transmits the EULUL control signal in the CQI slot. Pet. 34–35 (citing Ex. 1010, Fig. 7, ¶ 73; Lanning Decl. ¶ 95). Petitioner also relies on other disclosures in UMESH of transmitting the EULUL control signal by time-division multiplexing in the CQI slot that normally sets the channel quality indicator (CQI), and replacing CQI with the EULUL control signal without transmitting the radio quality information on the HS-DPCCH. *Id.* at 35–36 (citing Ex. 1010 ¶¶ 48, 58, 73; Lanning Decl. ¶¶ 97–99).

3. *Patent Owner's Preliminary Response*

In regard to the first control process requirement of claim 3, Patent Owner argues that Petitioner's reliance on the fact that UMESH discloses transmitting the RR (rate request)/SI (scheduling information) signal is insufficient because there is no suggestion in UMESH that the RR/SI signal is sent when the mobile terminal has not been allocated a radio resource for transmitting data. Prelim. Resp. 22–23 (citing Cooklev Decl. ¶ 62). In addition, Patent Owner points out that UMESH discloses transmitting the RR/SI signal in the enhanced user data transmission channel E-DPDCH 1a, but that user data is independently transmitted in a dedicated physical data channel DPDCH, and therefore the RR/SI signal is sent when the mobile terminal has already been allocated a radio resource (i.e., DPDCH) for transmitting data. *Id.* at 23–24 (citing Ex. 1010 ¶¶ 2–3, 10, 75; Cooklev Decl. ¶¶ 63–64).

In regard to the second control process requirement of claim 3, Patent Owner argues that

UMESH fails to disclose a second control process for mediating conflict between a scheduling request signal and a quality notification signal. In fact, UMESH teaches a notably different approach, to wedge the scheduling request signal into a timeslot in place of a quality notification signal. Thus, UMESH teaches a method devoid of the nuanced circumstance in which a scheduling request signal and a quality notification signal may both be transmitted without coincidence (i.e., conflict). In such a method, there is no need for two control processes to govern the transmission of the scheduling request signal, one for initially setting the transmission of the scheduling request signal and one for mediating when a conflict between coinciding quality notification and scheduling request signals being sent at the same time.

Prelim. Resp. 9–10 (citing Cooklev Decl. ¶ 38). Patent Owner focuses on the disclosures in UMESH, discussed above, in which (i) the CQI transmission on the HS-DPCCH channel is stopped every three subframes and the EULUL control signal is transmitted in the CQI slot (depicted in UMESH Figure 10, reproduced above), and (ii) CQI transmission is stopped and a notification signal is transmitted in the CQI slot prior to transmission of the EULUL control signal in the next CQI slot (depicted in UMESH Figure 11, reproduced above). *Id.* at 11–16 (citing Ex. 1010, Figs. 1–3, 10–11, ¶¶ 32–33, 35–36, 41–42, 44, 47–48, 53, 68–85; Cooklev Decl. ¶¶ 42–49). Patent Owner argues that, in these embodiments, the CQI and RR/SI signals are transmitted in a predetermined repeating pattern that is set in advance, are neither scheduled nor transmitted at the same time, and thus can never coincide as required by claim 3. *Id.* at 14, 16–19 (citing Cooklev Decl. ¶¶ 45–46, 49–56).

By the same token, Patent Owner argues that stopping the transmission of the CQI signals is not conditioned on the quality notification signal transmission coinciding with that of said scheduling request signal, as required by claim 3. *Id.* at 20–21 (citing Cooklev Decl. ¶¶ 57–59). Patent Owner asserts “UMESH never checks to determine if there is any actual or potential coincidence, conflict, or collision between the transmission of the CQI signal and the transmission of the EULUL control signal.” *Id.* at 21 (citing Cooklev Decl. ¶ 60).

4. Analysis

a) *The First Control Process Requirement Of Claim 3*

We agree with Patent Owner that UMESH would not have taught or suggested a control process that, “*when the mobile terminal has not been*

allocated a radio resource for transmitting said transmission data, transmitting said scheduling request signal to said base station.” Ex. 1001, 72:30–34 (emphasis added). While UMESH discloses transmitting scheduling request signals, there is no disclosure that this is done when the mobile terminal has not been allocated a radio resource for transmitting said transmission data. We credit Mr. Lanning’s statement that the first control process is performed “when it has data to send to the base station and does not have any uplink resources for doing so.” Ex. 1003 ¶ 139. However, as Patent Owner argues, user data is independently transmitted in a dedicated physical data channel DPDCH, and therefore the RR/SI signal is sent when the mobile terminal has already been allocated a radio resource (i.e., DPDCH) for transmitting data. Prelim. Resp. 23–24. Dr. Cooklev states that the E-DPDCH supplements the DPDCH, for which physical channels “already exist[]” when the enhanced access using E-EPDCH is configured. Ex. 2001 ¶ 64. Neither Petitioner nor Mr. Lanning show that UMESH teaches transmitting a scheduling request when the mobile terminal has not been allocated a radio resource through the DPDCH. Accordingly, at this stage of the proceeding, we are not able to determine that the Petition demonstrates a reasonable likelihood that Petitioner would prevail in establishing that UMESH would have taught or suggested the first control process requirement of claim 3.

b) The Second Control Process Requirement Of Claim 3

With respect to the second control process requirement of claim 3, notwithstanding Patent Owner’s arguments, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail in establishing that UMESH would have taught or suggested that requirement. As

discussed above in Section III.C, we agree with the court in the California case that the claim 3 requirement, “when a transmission of said quality notification signal coincides with that of said scheduling request signal in said transmitter,” should be construed to mean “when a transmission of said quality notification signal is scheduled to transmit or is transmitting at the same time as that of said scheduling request signal in said transmitter.” This is in accord with the statement in the ’656 patent that when the mobile terminal transmits the uplink scheduling request signal SR, the mobile terminal stops the transmission of a CQI symbol “which the mobile terminal was *originally scheduled to transmit at the same timing.*” Ex. 1001, 16:7–21 (emphasis added). As the court explained, “[t]his disclosure teaches temporarily preventing a scheduled transmission as opposed to stopping a transmission already in progress.” Ex. 2002, 11. UMESH discloses the same approach.

In particular, as discussed above in Section III.D.1, Figure 4 of UMESH illustrates a frame format showing a transition from the left portion, where the CQI (channel quality indicator) signal is scheduled to transmit in every frame of the uplink channel HS-DPCCH, to the right portion, where the scheduled CQI transmission is stopped for some frames and replaced by an EULUL control signal when needed. *See* Ex. 1010 ¶ 48 (“when a need arises to transmit the EULUL control signal, the mobile stations 20a to 20c transmit no channel quality indicator (CQI) in HS-DPCCH and perform transmission by replacing the channel quality indicator (CQI) with the EULUL control signal”). A control unit in the mobile station determines when the EULUL control signal replaces the CQI signal, such as at a set transmission interval. *Id.* ¶¶ 58–59. As discussed, the EULUL control

signal can include the RR (rate request)/SI (scheduling information) signal, which is information necessary in enhanced access for the base station to calculate uplink radio resources to assign to the mobile station. *Id.* ¶ 75.

In an example shown in Figure 10 of UMESH, “the radio control unit 23 of the mobile station 20a controls the radio unit 21 so CQI transmission on the HS-DPCCH 1c is **stopped** every three subframes and the EULUL control signal [consisting of the RR/SI signal] is transmitted in the CQI slot.” Ex. 1010 ¶ 73 (emphasis added). In another example, shown in Figure 11, a notification signal is transmitted prior to transmission of the EULUL control signal and, in the next frame, the mobile station “**stops** CQI transmission and transmits the EULUL control signal” (again consisting of an RR/SI signal). *Id.* ¶ 77 (emphasis added).

These examples satisfy the claim 3 condition, as construed, of “when a transmission of said quality notification signal is **scheduled** to transmit . . . at the same time as that of said scheduling request signal in said transmitter” (emphasis added). In UMESH, the normally scheduled CQI transmission pattern is stopped, and the required RR/SL signal is substituted in its place, thus satisfying the claim 3 requirement, “when a transmission of said quality notification signal **coincides** with [*i.e.*, is **scheduled** to transmit . . . at the same time as] that of said scheduling request signal . . . **stopping** transmitting said quality notification signal during a time interval during which said transmitter transmits said scheduling request signal.”

Patent Owner’s arguments to the contrary are not well taken. Patent Owner characterizes UMESH approach as “wedg[ing] the scheduling request signal into a timeslot in place of a quality notification signal.” Prelim. Resp. 9. However, that is simply another way of stating what the

claim (as properly construed) requires — when the CQI signal is scheduled to transmit at the same time as the scheduling request signal, stopping the former and instead transmitting the latter. Patent Owner asserts that “UMESH teaches a method devoid of the nuanced circumstance in which a scheduling request signal and a quality notification signal may both be transmitted without coincidence (i.e., conflict).” *Id.* at 9–10. However, we see no “nuanced circumstances” that differentiate between the claim language and the disclosed functionality of UMESH. Patent Owner asserts that claim 3 requires “one [control process] for initially setting the transmission of the scheduling request signal and one [control process] for mediating when a conflict between coinciding quality notification and scheduling request signals being sent at the same time.” *Id.* at 10. To the extent that Patent Owner is asserting that the claim requires a “mediating” process that requires more than stopping the CQI signal transmission when it is scheduled at the same time as the scheduling request signal, that argument is not commensurate with the scope of the claim. Patent Owner also argues that, for the UMESH examples of Figures 10 and 11, the transmission of the CQI and RR/SI signals occurs in a predetermined repeating pattern, set in advance, and that the signals are neither scheduled for transmission nor transmitted at the same time, and thus can never coincide as required by claim 3. Prelim. Resp. 14. However, the “predetermined repeating pattern” is the result of the controller of UMESH stopping the scheduled CQI transmission for some frames and replacing it with an EULUL control signal transmission when needed. *E.g.*, Ex. 1010, Fig. 4, ¶ 73. As discussed, UMESH satisfies the second control process requirement of claim 3.

c) The Remaining Claim 3 Requirements

Patent Owner does not address Petitioner’s analysis with respect to the requirements of claim 3 other than the two “control process” requirements, and upon review of Petitioner’s arguments and supporting evidence in this present record, we determine the Petition demonstrates a reasonable likelihood that Petitioner will prevail in establishing that UMESH would have taught or suggested those requirements.

d) Summary As To The Alleged Obviousness of Claim 3 Over UMESH

Accordingly, for the reasons set forth above, and in particular given our analysis of the first control process requirement of claim 3, we determine that the Petition does not demonstrate a reasonable likelihood that Petitioner would prevail in establishing that claim 3 is unpatentable under 35 U.S.C. § 103(a) over UMESH.

E. Alleged Obviousness of Claim 3 over UMESH and TS 25.309

Petitioner also challenges claim 3 as obvious over the combination of UMESH and 3GPP TS 25.309 V6.6.0 (“TS 25.309”). Pet. 37–43. The TS 25.309 Specification is titled “Technical Specification Group Radio Access Network; FDD Enhanced Uplink; Overall description; Stage 2 (Release 6)” and Petitioner asserts that it was publicly released no later than March of 2006. *Id.* at 22 (citing Ex. 1011). Petitioner relies on the disclosures in TS 25.309 of controlled scheduling of signal transmissions between mobile terminals and base stations, including CQI signals and Scheduling Requests. *Id.* Petitioner articulates reasons why one of ordinary skill would have been motivated to consider TS 25.309 in combination with UMESH, given that both involve transmission of standard 3GPP signals in the context of

Enhanced Uplink functionality. *Id.* at 37–38. Petitioner relies on TS 25.309 to supplement its challenges to claim 3 in regard to the requirements relating to transmission of quality notification and scheduling request signals. *Id.* at 38–42.

However, as Patent Owner points out, in regard to the first control process requirement of claim 3, and in particular the requirement, “when the mobile terminal has not been allocated a radio resource for transmitting said transmission data,” Petitioner relies only on the disclosure of UMESH, which, as discussed above, we determine is inadequate. Prelim. Resp. 24–25 (citing Pet. 43). (Petitioner also relies only on UMESH for the second control process requirement of claim 3, which, as discussed, is sufficient support of that aspect of Petitioner’s challenge. Pet. 43.)

Accordingly, for the same reasons as set forth above regarding the alleged obviousness of claim 3 over UMESH alone, and in particular concerning the first control process requirement of claim 3, we determine that the Petition does not demonstrate a reasonable likelihood that Petitioner would prevail in establishing that claim 3 is unpatentable under 35 U.S.C. § 103(a) over the combination of UMESH and TS 25.309.

F. Alleged Obviousness of Claim 3 over UMESH and R1-060583

Petitioner further challenges claim 3 as obvious over the combination of UMESH and R1-060583. Pet. 44–50. R1-060583, entitled “E-UTRA Uplink Control Signaling – Overhead Assessment,” is a contribution to the 3GPP LTE working group responsible for defining the LTE Specifications regarding the Radio Access Network (RAN), and Petitioner asserts it was made public no later than February 13–17, 2006. *Id.* at 23 (citing Ex. 1012).

Petitioner relies on the disclosures in R1-060583 of providing for uplink signaling messages in an LTE network, including CQI signals and Scheduling Requests. *Id.* at 23–25. Petitioner articulates reasons why one of ordinary skill would have been motivated to consider R1-060583 in combination with UMESH, given that both involve transmission of control signals for cellular wireless networks. *Id.* at 44–46. Petitioner relies on R1-060583 to supplement its challenges to claim 3 in regard to the requirements relating to transmission of quality notification and scheduling request signals. *Id.* at 46–49.

In addition, Petitioner relies on disclosures in R1-060583, in addition to those of UMESH, in regard to the first control process requirement of claim 3. Pet. 49–50. In particular, Petitioner relies on the disclosure in R1-060583 of a control process for “E-UTRA uplink control signaling,” and transmitting “scheduling requests” when the mobile terminal has not been allocated a radio resource for transmitting transmission data. *Id.* (citing Ex.1012, 1 (“scheduling requests are only transmitted when the UE does not have a valid scheduling grant”)); Lanning Decl. ¶ 172).

For the second control process requirement of claim 3, Petitioner relies only on UMESH, referencing its analysis for its challenge based on UMESH alone. Pet. 50.

Patent Owner’s response to Petitioner’s challenge based on the combination of UMESH and R1-060583 is confined to repeating its argument, discussed above, that UMESH would not have taught or suggested the second control process requirement of claim 3. Prelim. Resp. 25–26. As discussed above, despite Patent Owner’s arguments, we determine that Petitioner has demonstrated a reasonable likelihood that it

would prevail in establishing that UMESH would have taught or suggested that requirement.

Unlike its response regarding Petitioner's challenge based on UMESH alone, or based on the combination of UMESH and TS 25.309, Patent Owner does not address Petitioner's argument that the combination of UMESH and R1-060583 would have taught or suggested the first control process requirement of claim 3. Nor does Patent Owner address the remaining requirements of claim 3. Although, as discussed above, given Patent Owner's arguments, we are not able to determine that the Petition demonstrates a reasonable likelihood that Petitioner would prevail in establishing that UMESH alone, or in combination with TS 25.309, would have taught or suggested the first control process requirement of claim 3, that is not the case for Petitioner's more detailed presentation regarding the combination of UMESH and R1-060583. Upon review of Petitioner's arguments and supporting evidence in this present record, we determine the Petition demonstrates a reasonable likelihood that Petitioner will prevail in establishing that the first control process requirement of claim 3, as well as the remaining claim 3 requirements, would have been taught or suggested by the combination of UMESH and R1-060583.

Accordingly, we determine that the Petition demonstrates a reasonable likelihood that Petitioner would prevail in establishing that claim 3 is unpatentable under 35 U.S.C. § 103(a) over the combination of UMESH and R1-060583.

IV. CONCLUSION

After considering the evidence and arguments presented in the Petition and the Preliminary Response, Petitioner has established a

reasonable likelihood of prevailing on its assertion that claim 3 of the '656 patent is unpatentable. Accordingly, we institute an *inter partes* review on the challenged claim and all of the grounds presented in the Petition. At this stage of the proceeding, we have not made a final determination as to the patentability of this challenged claim.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that pursuant to 35 U.S.C. § 314, *inter partes* review is instituted as to the challenged claim of the '656 patent with respect to all grounds of unpatentability presented in the Petition; and

FURTHER ORDERED that *inter partes* review is commenced on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

IPR2023-00957
Patent 9,635,656 B2

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