

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ONEPLUS TECHNOLOGY (SHENZHEN) CO., LTD.,
Petitioners,

v.

PANTECH CORPORATION,
Patent Owner

IPR2025-00762

U.S. Patent No. 10,863,573

**PATENT OWNER'S RESPONSE TO PETITION
FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,863,573**

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<i>Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.</i> , 821 F.3d 1359 (Fed. Cir. 2016)	21
<i>KSR Int'l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007).....	20
<i>Medichem, S.A. v. Rolabo, S.L.</i> , 437 F.3d 1157 (Fed. Cir. 2006)	21
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PATENT OWNER'S EXHIBIT LIST

Exhibit Number	Description
2001	Second Amended Docket Control Order, <i>Pantech Corporation and Pantech Wireless, LLC v. OnePlus Technology (Shenzhen) Co., Ltd.</i> , No. 5:24-CV-00038-RWS-JBB (E.D. Tex.) (Dkt. 58) (May 13, 2025)
2002	United States District Courts – National Judicial Caseload Profile
2003	Pantech Corporation's July 9, 2021 Notice Letter to OnePlus Technology Co., Ltd.
2004	Third Amended Docket Control Order, <i>Pantech Corporation and Pantech Wireless, LLC v. OnePlus Technology (Shenzhen) Co., Ltd.</i> , No. 5:24-CV-00038-RWS-JBB (E.D. Tex.) (Dkt. 86) (July 17, 2025)
2005	Order Modifying Dates in Docket Control Order, <i>Pantech Corporation and Pantech Wireless, LLC v. OnePlus Technology (Shenzhen) Co., Ltd.</i> , No. 5:24-CV-00038-RWS-JBB (E.D. Tex.) (Dkt. 85) (July 17, 2025)
2006	Jury Verdict, <i>Pantech Corp. v. OnePlus Technology (Shenzhen) Co., Ltd.</i> , No. 5:22-cv-00069-RWS (E.D. Tex.) (Dkt. 259) (April 1, 2024)
2007	Final Judgment, <i>Pantech Corp. v. OnePlus Technology (Shenzhen) Co., Ltd.</i> , No. 5:22-cv-00069-RWS (E.D. Tex.) (Dkt. 499) (Jan. 23, 2025)
2008	Kiri Gupta & Urska Petrovcic, <i>Evidence of Systematic "Patent Holdout"</i> , 38 Berkeley Tech. L. J. (2023)
2009	Richard A. Epstein & Kayvan B. Noroozi, <i>Why Incentives for "Patent Holdout" Threaten to Dismantle FRAND, and Why It Matters</i> , 32 Berkeley Tech. L.J. 1381 (2017)
2010	Kalyan Dasgupta & David J. Teece, <i>Protecting Innovation in the Mobile Wireless Ecosystem: Understanding & Addressing "Hold-Out"</i> , 38 Berkeley Tech. L.J. 313 (2023)

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Patent Owner's Response

2011	Claim Construction Order from <i>Pantech Corp. et al. v. OnePlus Tech. (Shenzhen) Co., Ltd.</i> , No. 5:24-cv-00038-RWS-JBB (E.D. Tex.)
2012	Declaration of Dr. Paul Min in Support of Patent Owner's Response
2013	Transcript of December 18, 2025 Deposition of Dr. Titus Lo
2014	Certified Translation of Korean Patent Application No. 10-2013-0053408
2015	U.S. Patent Application Publication No. 2016/0113058

LISTING OF CHALLENGED CLAIMS

Claim	Claim Text
1[pre]	A method for user equipment receiving multi-flow data with respect to one evolved packet system (EPS) bearer through a macro base station (macro eNB) and a small base station (small eNB) serving a single cell in a wireless communication system supporting dual connectivity, the method comprising:
1[a]	receiving packet data convergence protocol (PDCP) packet data units (PDUs) through the macro base station and the small base station;
1[b]	obtaining PDCP service data units (SDUs) corresponding to the PDCP PDUs; and
1[c]	receiving from the macro base station information related to an in-sequence timer for the PDCP SDUs through a radio resource control (RRC) message,
1[d]	wherein the PDCP SDUs are indicated by a predefined PDCP sequence number (SN),
1[e]	wherein the RRC message includes a PDCP-configuration information element (IE), and
1[f]	the PDCP-configuration IE includes a field indicating a value of the in-sequence timer.
2	The method of claim 1, further comprising: confirming the respective PDCP SNs of the obtained PDCP SDUs and

	performing in sequence delivery of the PDCP SDUs to an upper layer from a PDCP entity according to the PDCP SN.
3[a]	The method of claim 2, further comprising: confirming whether there is a PDCP SDU of PDCP SN #n-1 which is missed notwithstanding obtaining a PDCP SDU of PDCP SN #n; and
3[b]	driving the in-sequence timer with respect to the PDCP SDU of PDCP SN #n when there is the PDCP SDU of PDCP SN #n-1 which is missed.
4[a]	The method of claim 3, wherein before the in-sequence timer for the PDCP SDU of PDCP SN #n has expired, when the PDCP SDU of PDCP SN #n-1 is obtained,
4[b]	the PDCP SDU of PDCP SN #n-1 and the PDCP SDU of PDCP SN #n are delivered to the upper layer according to the order of the PDCP SN.
5	The method of claim 2, wherein when the in-sequence timer for the PDCP SDU of PDCP SN #n has expired, the PDCP SDU of PDCP SN #n is delivered to the upper layer of the PDCP entity even though there is no PDCP SDU of PDCP SN #n-1.
8[pre]	A user equipment (UE) for receiving multi-flow data with respect to one evolved packet system (EPS) bearer through a macro base station (macro eNB) and a small base station (small eNB) serving a single cell in a wireless communication

	system supporting dual connectivity, the UE comprising:
8[a]	a receiving unit receiving packet data convergence protocol (PDCP) packet data units (PDUs) through the macro base station and the small base station and
8[b]	receiving from the macro base station information related to in-sequence timer for the PDCP SDUs through a radio resource control (RRC) message; and
8[c]	a processor obtaining PDCP service data units (SDUs) corresponding to the PDCP PDUs,
8[d]	wherein the PDCP SDUs are indicated by a predefined PDCP sequence number (SN),
8[e]	wherein the RRC message includes a PDCP-configuration information element (IE), and
8[f]	the processor determines the value of in-sequence timer based on the PDCP-configuration IE.
9[a]	The UE of claim 8, wherein the processor confirms the processor confirms the respective PDCP SNs of the obtained PDCP SDUs and
9[b]	performs in-sequence delivery of the PDCP SDUs to an upper layer from a PDCP entity according to the PDCP SN.
10[a]	The UE of claim 9, wherein the processor confirms whether there is a PDCP SDU of PDCP SN #n-1 which is missed notwithstanding obtaining a PDCP SDU of PDCP SN #n; and

10[b]	drives the in-sequence timer with respect to the PDCP SDU of PDCP SN #n when there is the PDCP SDU of PDCP SN #n-1 which is missed.
11	The UE of claim 10, wherein the processor delivers, when the in-sequence timer for the PDCP SDU of PDCP SN #n has expired, the PDCP SDU of PDCP SN #n to the upper layer of the PDCP entity even though there is no PDCP SDU of PDCP SN #n-1.
12	The UE of claim 10, wherein the processor delivers, before the in-sequence timer for the PDCP SDU of PDCP SN #n has expired, when the PDCP SDU of PDCP SN #n-1 is obtained, the PDCP SDU of PDCP SN #n-1 and the PDCP SDU of PDCP SN #n to the upper layer according to the order of the PDCP SN.

I. INTRODUCTION

Patent Owner Pantech Corporation (“Pantech”) respectfully requests that the Board confirm the patentability of claims 1-5 and 8-12 (“Challenged Claims”) of U.S. Patent No. 10,863,573 (“’573 Patent”) (EX1001). OnePlus Technology (Shenzhen) Co., Ltd. (“Petitioner”) has failed to show by a preponderance of the evidence that the challenged claims are unpatentable. Consistent with the prosecution history and previous findings of the Patent Office, Petitioner cannot demonstrate that any claim is obvious in view of the asserted prior art. For example, Koskinen, Deenoo, and Sammour, either individually or in any alleged combination, fail to disclose or suggest at least (i) “receiving from the macro base station information related to an in-sequence timer for the PDCP SDUs through a radio resource control (RRC) message,” (ii) “the PDCP-configuration IE includes a field indicating a value of the in-sequence timer,” and (iii) “the processor determines the value of in-sequence timer based on the PDCP-configuration IE.”

Moreover, the Petition is filled with conclusory statements, which (1) are neither bolstered nor supported by the similarly conclusory statements in Dr. Titus Lo’ declaration (EX1003), and (2) fail to demonstrate by a preponderance of the evidence that any of the Challenged Claims are rendered obvious by the asserted

combinations of references. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

For at least these reasons, Petitioner has failed to meet their burden of showing by a preponderance of the evidence that any of claims 1-5 and 8-12 are rendered obvious based on any of Grounds 1-3. Accordingly, the Broad should uphold the patentability of the '573 Patent.

II. BACKGROUND

A. Overview of the '573 Patent

The '573 Patent, titled “*Method And Apparatus For Sequential Forwarding Considering Multi-Flow In Dual Connectivity System*,” issued from U.S. Application No. 15/935,626, which was filed on March 26, 2018. *See* EX1001.

The claimed inventions relate to apparatuses and methods for in-sequence delivery considering a multi-flow in a wireless communication system supporting dual connectivity. EX1001 at 1:21-25. The '573 Patent is directed to solving problems whereby a packet data convergence protocol (PDCP) entity cannot sequentially acquire the PDCP service data units (SDUs). *Id.* at 2:34-3:21. In the conventional technology, “many communication demands are generated in a specific

area such as a hotspot in a cell and receiving sensitivity of radio waves may deteriorate in a specific area such as a cell edge or a coverage hole.” *Id.* at 1:29-32. “With the development of wireless communication technology, small cells, for example, a pico cell, a femto cell, a micro cell, a remote radio head (RRH), a relay, a repeater, and the like are together installed in a macro cell for the purpose of enabling communication in areas such as the hot spot, the cell edge, and the coverage hole.” *Id.* at 32-38. This network is known as “a heterogeneous network (HetNet)” in which “the macro cell is a cell having large coverage and the small cells such as the femto cell and the pico cell are cells having small coverage.” *Id.* at 40-42. “In the heterogeneous network environment, coverages of multiple macro cells and small cells overlap with each other.” *Id.* at 45-47; *see also* EX2012 at ¶ 49.

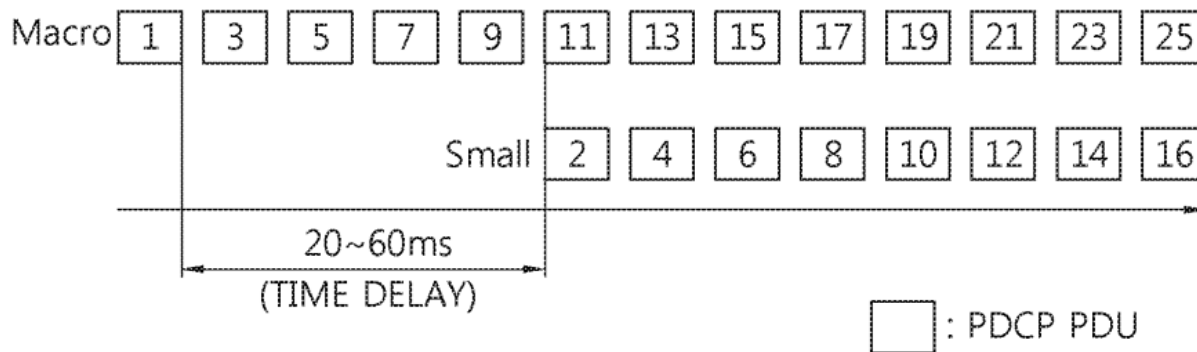
As Dr. Min explains in his declaration submitted herewith, a POSITA understands that the configuration discussed in the ’573 Patent includes the PDCP (as part of the Data Link Layer) located above the radio link control (“RLC”) layer and below the radio resource control (“RRC”) layer. EX2012 at ¶¶ 49-50. The PDCP layer at the UE communicates with the PDCP layer at the eNB in a peer-to-peer relationship, such that the PDCP packet communicated between the PDCP layers of the UE and the eNB may be understood by each other. EX2012 at ¶¶ 49-50.; *see*

EX1001, FIG. 3.

Dual connectivity is a concept of wireless communication whereby user equipment may transmit/receive services from two or more serving cells, which may belong to different base stations. *Id.* at 1:50-60. But the inventors of the '573 Patent recognized that existing protocols for reordering packet data units (PDUs) received at a UE were insufficient for dual connectivity. *Id.* at 1:65-2:30. “[I]n the case of the UE in which the multi-flows are constituted, the RLC entity for the small base station and the RLC entity for the macro base station are distinguished to receive the respective RLC SDUs and acquire the PDCP SDU and deliver the acquired PDCP SDU to the upper layer and in this case, the PDCP entity cannot sequentially acquire the PDCP SDUs.” *Id.* at 2:21-27. The inventors of the '573 Patent recognized that “in the case of the UE using the multi-flows, a new method for sequential delivery of the PDCP SDUs to the upper layer in the PDCP entity is required.” *Id.* at 2:27-30; *see also* EX2012 at ¶¶ 51-52.

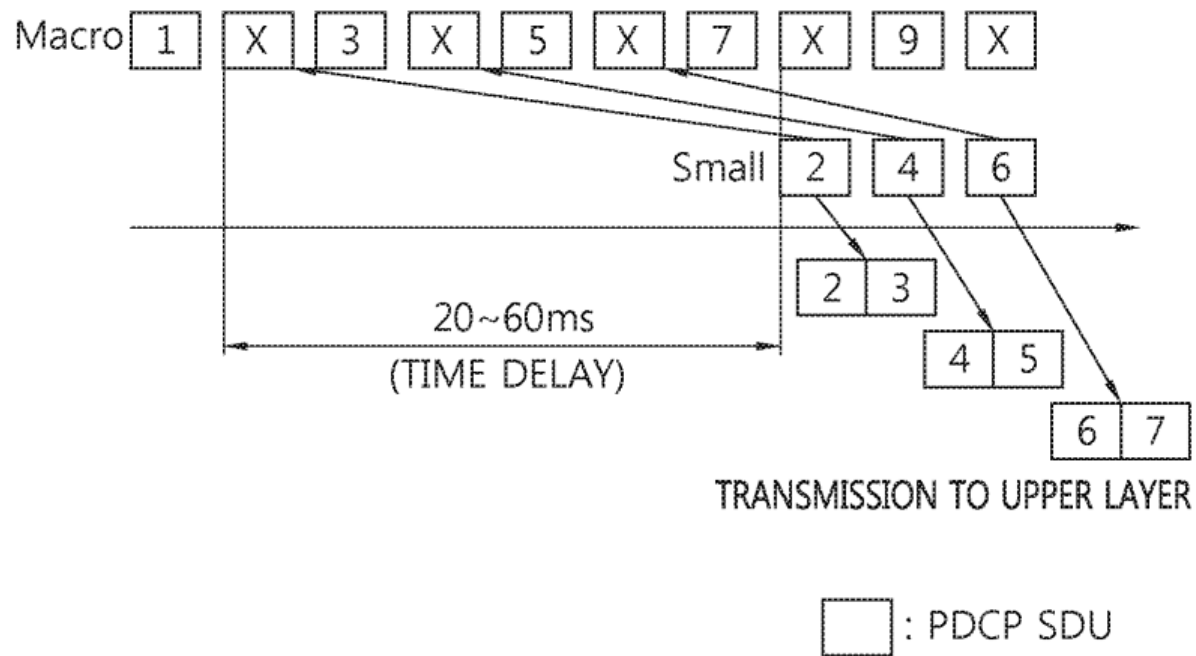
For example, FIG. 12 shows “an example of a PDCP PDU receiving timing in a PDCP entity of UE” and “a time when a PDCP PDU transmitted through a macro base station and a PDCP PDU transmitted through a small base station reach a PDCP entity of UE.” *Id.* at 12:30-34. “Accordingly, when the packet is transmitted to the

upper layer at a predetermined radio protocol end, even though the delay time is added, guaranteeing the sequential transmission may be more advantageous in terms of the overall capability of the network.” *Id.* at 14:10-14. EX2012 at ¶¶ 53-54.



EX1001, FIG. 12.

As another example, FIG. 13 shows “an example of sequential upper layer transmission depending on the PDCP sequence number (SN) in the PDCP entity of the UE.” *Id.* at 14:15-17. FIG. 13 shows “a case in which PDCH SDUs having odd PDCP SNs are received by the UE through the macro base station and PDCP SDUs having even PDCP SNs are received by the UE through the small base station.” *Id.* at 14:17-21; EX2012 at ¶¶ 55-56.



EX1001, FIG. 13.

As Dr. Min explains, the '573 Patent provide that any received PDCP SDU with a missing PDCP SDU with a smaller sequence number ("SN") is not transmitted to the upper layer until the in-sequence timer expires, such that the likelihood of the upper layer receiving the PDCP SDUs in-sequence is increased, which reduces problems with flow control caused by the receiving layer. EX2012 at ¶¶ 56-57. As Dr. Min explains, flow control often causes the reduction of the transmission window and consequently the bandwidth of the TCP connection. *Id.* The inventors of the '573 Patent recognized that the in-sequence timer may improve

capacity and latency, whereas solely relying on a discard timer, as in the conventional technology, implemented at the transmitting base station, could cause excessive retransmission and consequently waste of bandwidth. *Id.*

B. Prosecution History of the '573 Patent

U.S. Patent Application No. 15/935,626, which ultimately issued as the '573 Patent on December 8, 2020, was filed on March 26, 2018. The '573 Patent claims foreign priority to Korean Patent Application No. KR-10-2013-0053408, filed on May 10, 2013. A certified translation of Korean Patent Application No. KR-10-2013-0053408 is included as Exhibit 2014 (EX2014).

The '573 Patent is the result of a thorough examination whereby the Examiner considered prior art analogous to that in the Petition and found the invention patentable. *See* EX1002 at 12-20. During prosecution, the Examiner initially rejected the initial claim set based on U.S. Patent Application Publication No. 2015/0215827 ("Zhang") and U.S. Patent Application Publication No. 2010/0046448 ("Peisa"). EX1002 at 168-175. The Applicant argued, *inter alia*, that the correct priority dates of the claims is May 10, 2013, and therefore Zhang did not qualify as prior art. *Id.* at 156-157. The Examiner found this argument persuasive. *Id.* at 140. In response to a subsequent rejection of the initial claim set based on U.S. Patent Application

Publication No. 2012/0182971 (“Ohta”) and U.S. Patent Application Publication No. 2010/0304733 (“Yi”), the Applicant argued, *inter alia*, that neither Ohta nor Yi rendered obvious the claimed in-sequence timer, and in particular that Yi instead disclosed a "discard timer." *Id.* at 138-144 and 127-129. The Examiner again found this argument persuasive. *Id.* at 110. The Examiner then again rejected the initial claim set based on a new reference, U.S. Patent Application Publication No. 2015/0373559 (“Hong”), combined with Ohta and Yi. *Id.* at 108-114. At this time, the Applicant amended claim 1 and added claims 2-12. *Id.* at 36-39. The Applicant argued that Hong discloses an "activation/deactivation timer" and not an in-sequence timer as required by the claim. *Id.* at 40-43; EX2012 at ¶¶ 58-60.

The Examiner found this persuasive and allowed the application. The Patent Office issued a Notice of Allowance on July 24, 2020. *Id.* at 12-20. In this Notice of Allowance, the Examiner acknowledged that the cited references “fail[] to disclose or render obvious the received in-sequence timer for the PDCP SDUs and how the in-sequence timer is delivered as claimed.” *Id.* at 17-19; EX2012 at ¶ 61.

C. Summary of Instituted Grounds for Unpatentability

The Board instituted review of claims 1-5 and 8-12 of the '573 Patent based on three grounds of alleged unpatentability. *See* Pet. at 1; Paper 10. The instituted

invalidity grounds are summarized as follows:

Ground	'573 Claims	Type of Challenge	References
1	1-5 and 8-12	§ 103	Koskinen
2	1-5 and 8-12	§ 103	Koskinen in view of Sammour
3	1-5 and 8-12	§ 103	Deenoo in view of Sammour

D. Cited References

The three references relied upon are summarized as follows:

1. Overview of Koskinen (EX1005)

U.S. Patent Application Publication No. 2014/0301362 (“Koskinen”), published on October 9, 2012, is generally directed to “observing a gap in a sequence of protocol data units received from a plurality of lower-layer protocol entities providing data transfer [and] starting a timer upon the gap observation [and] preventing the gap from blocking delivery of service data units to a higher layer, when the timer expires.” EX1005 at ¶18; see EX2012 at ¶ 63.

2. Overview of Sammour (EX1006)

U.S. Patent Application Publication No. 2009/0149189 (“Sammour”), published on June 11, 2009, is generally directed to “supporting configuration and control of the radio link control (RLC) and packet data control protocol (PDCP) sub-

layers by defining and using radio resource control (RRC) parameters and procedures.” EX1006 at ¶15. Sammour states that “[t]he eNB utilizes a PDCP In sequence delivery IE to indicate to the WTRU that the WTRU PDCP entity is required to provide in-sequence delivery (i.e. reordering).” *Id.* at ¶146. Sammour also states “[t]he eNB uses a PDCP Reordering Stop Mode IE to indicate to the WTRU that the WTRU PDCP entity whether it should use the timer mechanism (e.g. Flush Timer) to stop reordering following handover, or whether it should use stop reordering after all stored PDCP SDUs have been delivered to upper layers.” *Id.* at ¶149; *see* EX2012 at ¶ 64.

3. Overview of Deenoo (EX1007)

U.S. Patent Application Publication No. 2016/0021581 (“Deenoo”), published on January 21, 2016, is generally directed to “small-cell enhancements such as they relate to dual-connectivity scenarios.” EX1007 at ¶22. “One or more embodiments contemplate techniques for PDCP re-ordering that may include starting a reordering timer, for example perhaps when an out of sequence packet may be received from any one of RLC entities.” *Id.* at ¶211. “A PDCP status report may be transmitted, for example to trigger retransmission, perhaps in some embodiments if the time to expiry for the reordering timer may be more than a configured report

threshold.” *Id.* “One or more, or all, queued PDUs and/or advancing the PDCP receive window and/or canceling the re-ordering timer may be done, for example perhaps if the time to expiry for the reordering timer may be less than a configured report threshold.” *Id.*; *see* EX2012 at ¶ 65.

III. PRIORITY DATE OF THE '573 PATENT

The '573 Patent is entitled to its priority claim to Korean Patent Application No. KR-10-2013-0053408, filed on May 10, 2013 (EX2014), by way of its priority claim to U.S. Application No. 14/890,407 (corresponding to U.S. Patent Application Publication No. 2016/0113058), filed on May 9, 2014 (EX2015). As explained by Dr. Min in §VI (¶¶ 66-91) of his declaration (EX2012), support for claims 1-5 and 8-12 of the '573 Patent can be found in at least the following passages of the priority applications:

'573 Patent Claim Element	Support in U.S. Application Pub. No. 2016/0113058 (EX2015)	Support in KR-10-2013-0053408 (EX2014)
[1.pre] A method for user equipment receiving multi-flow data with respect to one evolved packet system (EPS) bearer through a macro base station (macro eNB) and a small base station (small eNB) serving a single cell in a wireless communication system supporting dual connectivity, the method comprising:	¶¶ 13-15, 99-125, Figs. 12-14; <i>see also</i> EX2012 at ¶ 68.	¶¶ 10-11, 81-108, Figs. 12-14; <i>see also</i> EX2012 at ¶ 68.
[1.a] receiving packet data convergence protocol (PDCP) packet data units (PDUs) through the macro base station and the small base station;	¶¶ 13-15, 100-101, 106-111, Figs. 12-13; <i>see also</i> EX2012 at ¶ 69.	¶¶ 10-11, 82-83, 88-93, Figs. 12-13; <i>see also</i> EX2012 at ¶ 69.
[1.b] obtaining PDCP service data units (SDUs) corresponding to the PDCP PDUs; and	¶¶ 13-15, 102, Fig. 13; <i>see also</i> EX2012 at ¶ 70.	¶¶ 10-11, 84, Fig. 13; <i>see also</i> EX2012 at ¶ 70.
[1.c] receiving from the macro base station information related to an in-sequence timer for the PDCP SDUs through a radio resource control (RRC) message,	¶¶ 13-15, 118-120, 130, 135; <i>see also</i> EX2012 at ¶ 71.	¶¶ 10-11, 100-103, 113, 118; <i>see also</i> EX2012 at ¶ 71.
[1.d] wherein the PDCP SDUs are indicated by a predefined PDCP sequence number (SN),	¶¶ 13-15, 109-114, Fig. 14; <i>see also</i> EX2012 at ¶ 72.	¶¶ 10-11, 91-96, Fig. 14; <i>see also</i> EX2012 at ¶ 72.

[1.e] wherein the RRC message includes a PDCP-configuration information element (IE), and	¶¶ 13-15, 118-120, 130, 135; <i>see also</i> EX2012 at ¶ 73.	¶¶ 10-11, 100-103, 113, 118; <i>see also</i> EX2012 at ¶ 73.
[1.f] the PDCP-configuration IE includes a field indicating a value of the in-sequence timer.	¶¶ 13-15, 118-120, 130, 135; <i>see also</i> EX2012 at ¶ 74.	¶¶ 10-11, 100-103, 113, 118; <i>see also</i> EX2012 at ¶ 74.
[2] The method of claim 1, further comprising: confirming the respective PDCP SNs of the obtained PDCP SDUs and performing in sequence delivery of the PDCP SDUs to an upper layer from a PDCP entity according to the PDCP SN.	¶¶ 10, 13-15, 98, 102, 108-111, 115 124-125, 139, Figs. 13-14; <i>see also</i> EX2012 at ¶ 75.	¶¶ 7, 10-11, 80, 84, 90-94, 97, 107-108, 122, Figs. 13-14; <i>see also</i> EX2012 at ¶ 75.
[3.a] The method of claim 2, further comprising: confirming whether there is a PDCP SDU of PDCP SN #n-1 which is missed notwithstanding obtaining a PDCP SDU of PDCP SN #n; and	¶¶ 13-15, 109, 120-125; <i>see also</i> EX2012 at ¶ 76.	¶¶ 10-11, 91, 103-108; <i>see also</i> EX2012 at ¶ 76.
[3.b] driving the in-sequence timer with respect to the PDCP SDU of PDCP SN #n when there is the PDCP SDU of PDCP SN #n-1 which is missed.	¶¶ 13-15, 109, 120-125; <i>see also</i> EX2012 at ¶ 77.	¶¶ 10-11, 91, 103-108; <i>see also</i> EX2012 at ¶ 77.

[4] The method of claim 3, wherein before the in-sequence timer for the PDCP SDU of PDCP SN #n has expired, when the PDCP SDU of PDCP SN #n-1 is obtained, the PDCP SDU of PDCP SN #n-1 and the PDCP SDU of PDCP SN #n are delivered to the upper layer according to the order of the PDCP SN.	¶¶ 13-15, 111, 115-117, 124; <i>see also</i> EX2012 at ¶ 78.	¶¶ 10-11, 93, 97-99, 107; <i>see also</i> EX2012 at ¶ 78.
[5] The method of claim 2, wherein when the in-sequence timer for the PDCP SDU of PDCP SN #n has expired, the PDCP SDU of PDCP SN #n is delivered to the upper layer of the PDCP entity even though there is no PDCP SDU of PDCP SN #n-1.	¶¶ 13-15, 110-111, 125; <i>see also</i> EX2012 at ¶ 79.	¶¶ 10-11, 92-93, 108; <i>see also</i> EX2012 at ¶ 79.
[8.pre] A user equipment (UE) for receiving multi-flow data with respect to one evolved packet system (EPS) bearer through a macro base station (macro eNB) and a small base station (small eNB) serving a single cell in a wireless communication system supporting dual connectivity, the UE comprising:	¶¶ 13-15, 99-125, Figs. 12-15; <i>see also</i> EX2012 at ¶ 80.	¶¶ 10-11, 81-108, Figs. 12-15; <i>see also</i> EX2012 at ¶ 80.
[8.a] a receiving unit receiving packet data convergence protocol (PDCP) packet data units (PDUs) through the macro base station and the small base station and	¶¶ 13-15, 100-101, 106-111, Figs. 12-13, 15; <i>see also</i> EX2012 at ¶ 81.	¶¶ 10-11, 82-83, 88-93, Figs. 12-13, 15; <i>see also</i> EX2012 at ¶ 81.

[8.b] receiving from the macro base station information related to in-sequence timer for the PDCP SDUs through a radio resource control (RRC) message; and	¶¶ 13-15, 118-120, 130, 135; <i>see also</i> EX2012 at ¶ 82.	¶¶ 10-11, 100-101, 103, 113, 118; <i>see also</i> EX2012 at ¶ 82.
[8.c] a processor obtaining PDCP service data units (SDUs) corresponding to the PDCP PDUs,	¶¶ 13-15, 102, Figs. 13, 15; <i>see also</i> EX2012 at ¶ 83.	¶¶ 10-11, 84, Figs. 13, 15; <i>see also</i> EX2012 at ¶ 83.
[8.d] wherein the PDCP SDUs are indicated by a predefined PDCP sequence number (SN),	¶¶ 13-15, 109-114, Fig. 14; <i>see also</i> EX2012 at ¶ 84.	¶¶ 10-11, 91-96, Fig. 14; <i>see also</i> EX2012 at ¶ 84.
[8.e] wherein the RRC message includes a PDCP-configuration information element (IE), and	¶¶ 13-15, 118-120, 130, 135; <i>see also</i> EX2012 at ¶ 85.	¶¶ 10-11, 91-96, Fig. 14; <i>see also</i> EX2012 at ¶ 85.
[8.f] the processor determines the value of in-sequence timer based on the PDCP-configuration IE.	¶¶ 13-15, 118-120, 130, 135; <i>see also</i> EX2012 at ¶ 86.	¶¶ 10-11, 91-96, Fig. 14; <i>see also</i> EX2012 at ¶ 86.
[9] The UE of claim 8, wherein the processor confirms the processor confirms the respective PDCP SNs of the obtained PDCP SDUs and performs in-sequence delivery of the PDCP SDUs to an upper layer from a PDCP entity according to the PDCP SN.	¶¶ 10, 13-15, 98, 102, 108-111, 115 124-125, 139; <i>see also</i> EX2012 at ¶ 87.	¶¶ 7, 10-11, 80, 84, 90-94, 97, 107-108, 122; <i>see also</i> EX2012 at ¶ 87.
[10.a] The UE of claim 9, wherein the processor confirms whether there is a PDCP SDU of PDCP SN #n-1 which is missed notwithstanding obtaining a PDCP SDU of PDCP SN #n; and	¶¶ 13-15, 109, 120-125; <i>see also</i> EX2012 at ¶ 88.	¶¶ 10-11, 91, 103-108; <i>see also</i> EX2012 at ¶ 88.

[10.b] drives the in-sequence timer with respect to the PDCP SDU of PDCP SN #n when there is the PDCP SDU of PDCP SN #n-1 which is missed.	¶¶ 13-15, 109, 120-125; <i>see also</i> EX2012 at ¶ 89.	¶¶ 10-11, 91, 103-108; <i>see also</i> EX2012 at ¶ 89.
[11] The UE of claim 10, wherein the processor delivers, when the in-sequence timer for the PDCP SDU of PDCP SN #n has expired, the PDCP SDU of PDCP SN #n to the upper layer of the PDCP entity even though there is no PDCP SDU of PDCP SN #n-1.	¶¶ 13-15, 110-111, 125; <i>see also</i> EX2012 at ¶ 90.	¶¶ 10-11, 92-93, 108; <i>see also</i> EX2012 at ¶ 90.
[12] The UE of claim 10, wherein the processor delivers, before the in-sequence timer for the PDCP SDU of PDCP SN #n has expired, when the PDCP SDU of PDCP SN #n-1 is obtained, the PDCP SDU of PDCP SN #n-1 and the PDCP SDU of PDCP SN #n to the upper layer according to the order of the PDCP SN.	¶¶ 13-15, 111, 115-117, 124; <i>see also</i> EX2012 at ¶ 91.	¶¶ 10-11, 93, 97-99, 107; <i>see also</i> EX2012 at ¶ 91.

Petitioner has not raised any argument against the priority claims of the '573 Patent. Patent Owner reserves the right to respond to any arguments made by Petitioner.

IV. LEVEL OF ORDINARY SKILL

Petitioner proposes that a person of ordinary skill in the art (POSITA) would

have had “a bachelor's degree in electrical engineering, computer engineering, computer science, or a related field and at least two years of practical experience with design or development of telecommunication and/or wireless communications systems, or the equivalent.” Pet. at 7; *see also* EX1003 at ¶¶19-21.

Patent Owner does not contest that the relevant fields of art include electrical engineering, computer engineering, and/or computer science with experience in design or development of telecommunication and/or wireless communications systems. As explained in his attached Declaration, Patent Owner's expert, Dr. Paul Min, satisfies this criteria as a POSITA. EX2012 at ¶¶ 92-93.

V. CLAIM CONSTRUCTION

A. The Proper Construction of “an in-sequence timer”

As set forth by the '573 Patent:

The PDCP sequence number (SN) of the PDCP SDU corresponding to the PDP PDU received in the PDCP entity is confirmed and if the PDCP SN of the PDCP SDU is not sequential (that is, when the SN prior to the PDCP SN of the PDCP SDU is missed), an in-sequence timer for the PDCP SDU is driven... When the in-sequence timer for the PDCP SDU has expired, the PDCP SDU is transmitted to the upper layer.

'573 Patent at 13:43-55; *see also id.* at 13:56-14:2, 15:51-65 (similar disclosures).

Thus, the '573 Patent is clear what an “in-sequence timer” is: it is a timer that begins upon the detection of an out-of-sequence SDU and lasts for a period of time. EX2012 at ¶¶ 94-100. Petitioner's expert, Dr. Lo agrees: “[Q.] Would it be a fair characterization of this portion in column 13 [13:43-53] of the '573 patent to say that the in-sequence timer is a timer that begins upon detection of an out-of-sequence SDU? A. Yes.” EX2013 at 64:17-22; EX2012 at ¶ 100.

This plain and ordinary usage is confirmed by the actual usage of “in-sequence timer” in the patent claims, which specify the usage of an “in-sequence timer for the PDCP SDUs.” '573 Patent at independent claims 1, 8 (emphasis added). Dependent claims 3 and 10 provide further limitations directed to beginning the in-sequence timer, and dependent claims 4, 5, 11, and 12 concern actions that may be taken by the UE prior to expiration or upon expiration of the in-sequence timer. EX2012 at ¶ 101.

Respectfully, the Institution Decision (“ID”) (Paper 10) may have misunderstood the meaning of an “in-sequence timer.” See ID at 13 (“A person having ordinary skill in the art would have understood that t-Reordering is used to place the SDUs that were received out of order back into sequence (‘reordered[]’), and, therefore, is an ‘in-sequence timer for the PDCP SDUs’ as recited in claim 1.”).

Reordering may, or may not, occur during the period of the in-sequence timer, but is not a function of the in-sequence timer itself. EX2012 at ¶¶ 94-97.

As Dr. Min explains, the purpose of the t-Reordering timer is to detect any missing PDCP SDU. EX2012 at ¶¶ 94-97. The t-Reordering timer is triggered when a PDCP packet is received non-consecutively in their sequence numbers, and it then work with another timer that triggers the retransmission. *Id.* The 3GPP standard allows very large values for the t-Reordering timer, which allows the round-trip delay between the transmitting device and the receiving device. *Id.* The in-sequence timer taught by the '573 Patent is different: its value is specific to the difference between the latencies along a slower path (*e.g.*, via a small base station) and along a faster path (*e.g.*, via a large base station). *Id.* The in-sequence timer does not address the case of packet loss, which is the main purpose of the t-Reordering timer. *Id.* Instead, the packet loss is addressed by the retransmission performed at another layer, such as the TCP layer. *Id.*

Accordingly, as explained above, an in-sequence timer is distinct from a t-Reordering timer and instead is a timer that begins upon the detection of an out-of-sequence SDU and lasts for a period of time.

B. All Remaining Claim Terms Should be Given Their Plain and Ordinary Meaning

For purposes of this proceeding, Petitioner has not identified any claim terms for construction as necessary to resolve the controversy, and therefore applies the plain and ordinary meaning to the claims. Patent Owner agrees that the plain and ordinary meaning should apply to the claims, setting aside the meaning of “in-sequence timer” as addressed above. Patent Owner reserves the right to contest any claim constructions raised by Petitioner in any future filings or at any hearing.

VI. LEGAL STANDARD

A claim is also not patentable if the differences between the claim and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time of the invention. 35 U.S.C. § 103(a) (pre-AIA). Obviousness requires assessing (1) the “level of ordinary skill in the pertinent art,” (2) the “scope and content of the prior art,” (3) the “differences between the prior art and the claims at issue,” and (4) “secondary considerations” of non-obviousness such as “commercial success, long felt but unsolved needs, failure of others, etc.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966)).

It is the petitioner's burden to prove unpatentability, *E.I DuPont de Nemours & Co. v. Synvina C.V.*, 904 F.3d 996, 1007 (Fed. Cir. 2018), and "to demonstrate both 'that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.'" *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367-68 (Fed. Cir. 2016) (quotations and citations omitted). However, petitioners must first show that all of the claimed elements are disclosed in the prior art. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1164 (Fed. Cir. 2006) (considering motivation to combine and reasonable expectation of success only "if all the elements of an invention are found in a combination of prior art references").

VII. THE PETITION FAILED TO SHOW ANY CHALLENGED CLAIM IS RENDERED OBVIOUS BY A PREPONDERANCE OF THE EVIDENCE

Petitioner has failed to show by a preponderance of the evidence that any of Grounds 1-3 renders obvious claims 1-5 and 8-12. Therefore, Patent Owner respectfully submits that the Board should confirm the patentability of all Challenged Claims. EX2012 at ¶ 102.

A. Ground 1: Petitioner Fails to Establish That Claims 1-5 and 8-12 Would Have Been Obvious Based on Koskinen

Petitioner has not shown by a preponderance of the evidence that claims 1-5 and 8-12 are invalid based on Ground 1 because the alleged modification to Koskinen would not have been obvious to a POSITA and fails to disclose or suggest key features of the '573 Patent's invention, as discussed in detailed below. See EX2012 at § IX(A).

1. Petitioner Fails to Establish That Claim Elements 1[c] and 8[b] Would Have Been Obvious Based on Koskinen

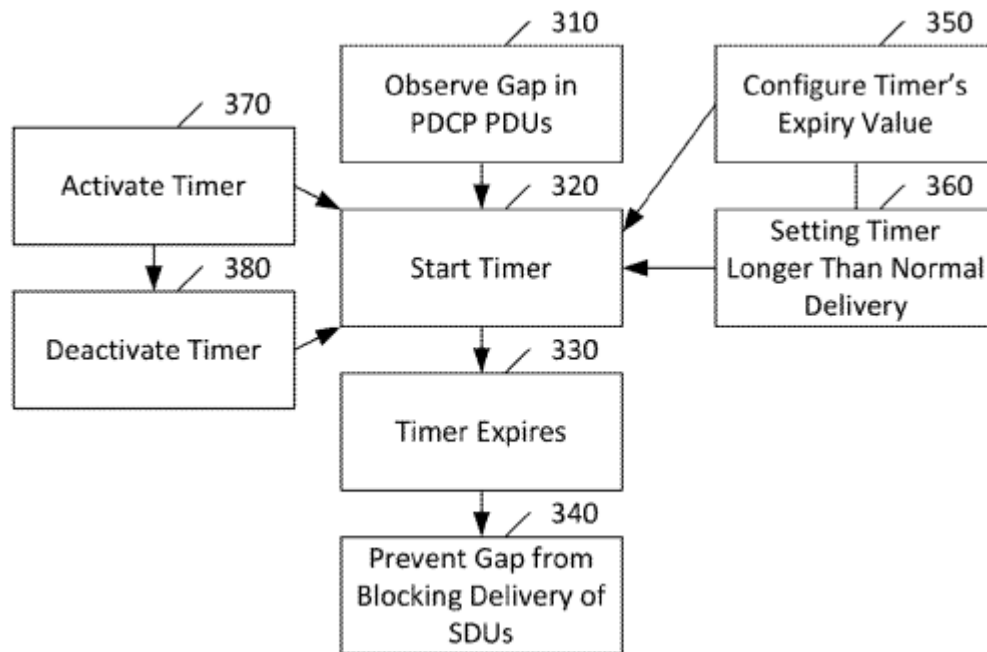
Claim Element 1[c] recites “receiving from the macro base station information related to *an in-sequence timer for the PDCP SDUs through a radio resource control (RRC) message.*” (Emphasis added). Similarly, Claim Element 8[b] recites “receiving from the macro base station information related to *in-sequence timer for the PDCP SDUs through a radio resource control (RRC) message.*” (Emphasis added). The Petition fails to establish that Koskinen (the only reference relied upon in Ground 1) would have rendered obvious this limitation.

The Petition appears to recognize its own shortcomings in its mapping of Element 1[c] and 8[b] to Koskinen and attempts to distort the disclosure of Koskinen to compensate. EX2012 at ¶¶ 104-107.

It may be important to begin with what Koskinen *does* describe. Koskinen describes “in-sequence delivery of protocol data units received in parallel from several lower-layer acknowledged-mode protocol entities may benefit from reordering timers and/or forwarding status reports.” EX1005 at ¶ 2. The method described in Koskinen includes “observing a gap in a sequence of protocol data units received from a plurality of lower-layer protocol entities providing data transfer... starting a timer upon the gap observation... [and] preventing the gap from blocking delivery of service data units to a higher layer, when the timer expires.” *Id.* at ¶ 18. Koskinen describes that “where a plurality of independent RLC-AM bearers may be harnessed to convey data of a PDCP bearer, the PDCP entity at the user equipment may be bound to receive PDCP protocol data units from multiple underlying RLC entities in a highly interlaced manner.” *Id.* at ¶ 35. Koskinen thus confronts the situation in which “if the PDCP at the user equipment always waits for reception gaps to be filled before delivery of data to higher layer, then at a handover without forwarding the bearer may go into deadlock, because the gaps created by packets that were not forwarded will never be received.” *Id.* Koskinen addresses this situation by providing a method “for the PDCP entity at the user equipment to deduce when not to expect reception gaps to be filled.” *Id.* at ¶ 36; *see* EX2012 at ¶¶

107-108.

Koskinen describes that “certain embodiments utilize a timer, such as a reordering timer, as shown in FIG. 2.” *Id.* at ¶ 37, FIG. 2 (reproduced below); EX2012 at ¶ 109.



EX1005, FIG. 2.

With reference to FIG. 2 (shown above), Koskinen describes “a timer, such as a reordering timer, can be started at 320 whenever a gap in the received protocol data units is observed at 310, such as by observing a gap in a sequence of protocol data units.” EX1005 at ¶ 38; EX2012 at ¶ 110. “Once the timer expires at 330, that

gap is no longer allowed to block delivery of service data units to higher layer, at 340.” EX1005 at ¶ 38. “The timer's expiry value can be configured by radio resource control (RRC) at 350, and can be set at 360 long enough so that the timer does not expire during normal delivery delay of protocol data units sent by the eNB to the user equipment via a small-cell node, for example, including all possible HARQ and ARQ retransmissions at MAC and RLC level therein, respectively.” *Id.* at ¶ 39. Given the delay caused by these “gaps,” Koskinen describes the network sending “a forwarding-status report” to the UE to “explicitly tell the user equipment (after handover)” which PDU SNs it should expect to receive or not expect to receive. *Id.* at ¶ 40; EX2012 at ¶¶ 110-11.

Thus, at the outset, Koskinen does not teach “a timer that begins upon the detection of an out-of-sequence SDU and lasts for a period of time” (Patent Owner's proposed construction for an in-sequence timer): instead it discloses a “reordering timer” that starts “whenever a gap in the received protocol data units is observed at 310, such as by observing a gap in a sequence of protocol data units.” EX1005 at ¶ 38; EX2012 at ¶¶ 110-113. There is a clear and meaningful difference between “observing a gap in a sequence of protocol data units” and any “detection of an out-of-sequence SDU.” EX2012 at ¶¶ 110-113. Koskinen describes that the purpose of

its reordering timer is to allow for “all possible HARQ and ARQ retransmissions at MAC and RLC level therein” (EX1005 at ¶ 39), which teaches a POSITA that Koskinen's reordering timer is **not** the same as the claimed “in-sequence timer” because it accounts for the difference in the latencies between a faster communication path (*e.g.*, from a macro base station to the UE) and a slower communication path (*e.g.*, from the small base station to the UE). See EX2012 at ¶¶ 110-113.

Perhaps in recognition of this difference, Petitioner asserts that Koskinen teaches the claimed in-sequence timer because “Koskinen describes re-purposing the timer operating at the RLC level to be used at the PDCP layer (*‘in-sequence timer’*).” Pet. at 18-19. But Petitioner offers a distorted reading of Koskinen: Koskinen's generalized proposal to “repurpose” RLC state variables for PDCP acknowledged-mode (AM) data transfer does not render obvious the claimed in-sequence timer for PDCP SDUs. EX2012 at ¶ 114.

Petitioner's mapping conflates a layer-specific RLC t-Reordering timer with the claimed in-sequence timer for PDCP SDUs. EX2012 at ¶¶ 114-116. Petitioner provides nothing more than conclusory statements, parroted from Dr. Lo's declaration (EX1003 at ¶140), that Koskinen's RCL-focused reordering timer can

be reconfigured to serve as an in-sequence timer for PDCP SDUs. EX2012 at ¶¶ 114-116. The mere suggestion that PDCP could repurpose RLC state variables is not a disclosure of the claimed PDCP in-sequence timer as a timer for a received PDCP SDU and sets a time period for receiving a missed PDCP SDU having a sequence number that is previous in sequence number to the received PDCP SDU. EX2012 at ¶¶ 114-116. Petitioner points to no specific teaching in Koskinen (and none exists) to support this reconfiguration of an RLC-based timer for PDUs to a PDCP-based in-sequence timer for SDUs and relies entirely on impermissible hindsight reconstruction of the claimed in-sequence timer. *Id.*

In fact, Dr. Lo alleged at his deposition, when explaining the use of the timer described by Koskinen, that Koskinen teaches that “you can just repurpose the timer at RRC into the PDCP layer. And the RRC timer operation has already defined or specified in the standard for RRC layer. So you can just repurpose it.” EX2013 at 96:22-97:2¹. However, Dr. Lo (whether in his declaration or at deposition) does not explain *how* a POSITA would have found it obvious to use the teachings of

¹ It appears that Dr. Lo misspoke by referring to an “RRC timer” and “RRC layer,” and instead his comments relate to the RLC timer and RLC layer of Koskinen.

Koskinen's RLC reordering timer, repurposed for the PDCP layer, to further reconfigure the reordering timer to be the claimed in-sequence timer for PDCP SDUs. EX2012 at ¶¶ 115-116. This is a meaningful shortcoming.

In addition, Koskinen describes configuring the expiration value of the timer to be “set at 360 long enough so that the timer does not expire during normal delivery delay of protocol data units sent by the eNB to the user equipment via a small-cell node, for example, including all possible HARQ and ARQ retransmissions at MAC and RLC level therein, respectively.” EX1005 at ¶ 39. However, Koskinen does not teach a POSITA the meaning of “long enough” or how a POSITA could arrive at the claimed in-sequence timer—to assert otherwise is pure hindsight. EX2012 at ¶¶ 108-116. As Dr. Min explains, it would be ambiguous to a POSITA as to what Koskinen's teachings regarding setting the timer “long enough” would mean. EX2012 at ¶111. Adding to the ambiguity of “long enough,” Petitioners expert, Dr. Lo, testified that there may be multiple “considerations” in determining how long “long enough” might be and this determination would “depend[] on the system design...” EX2013 at 86:19-88:15; *see* EX2012 at ¶111.

In addition, Koskinen describes that this “long enough” period should include “all possible HARQ and ARQ retransmissions at MAC and RLC level therein,

respectively.” EX1005 at ¶ 39. As Dr. Min explains, this teaches a POSITA that Koskinen's timer is **not** the claimed “in-sequence timer,” which accounts for the differences in the latencies between multiple communication paths of the multi-flow configuration addressed in the '573 Patent, such as a faster communication path (*e.g.*, from the large base station to the UE) and a slower communication path (*e.g.*, from the small base station to the UE). EX2012 at ¶111.

During prosecution of the '573 Patent, the Applicant distinguished other forms of timers in the prior art, and the Examiner ultimately agreed each time. *See, e.g.*, EX1002 at 42 (distinguishing the "cell activation/deactivation timer" of Hong); *id.* at 128 (distinguishing the "discard timer" of Yi). The reordering timer of Koskinen is no different: it is a different timer that is not an in-sequence timer for PDCP SDUs, even when repurposed from RLC-UM data transfer to RCL-AM data transfer (*see* EX1005 at ¶37). EX2012 at ¶ 117-118.

For at least the foregoing reasons, Petitioner fails to show by a preponderance of the evidence that Claim Elements 1[c] and 8[b] would have been rendered obvious based on Koskinen.

2. Petitioner Fails to Establish That Claim Elements 1[e] & 1[f] and 8[e] & 8[f] Would Have Been Obvious Based on Koskinen

Claim Element 1[e] (and similarly Claim Element 8[e]) recites “wherein the RRC message includes a PDCP-configuration information element (IE)” and Claim Element 1[f] (and similarly Claim Element 8[f]) recites “the PDCP-configuration IE includes a field indicating a value of the in-sequence timer.” Although Claim Elements 1[e] and 1[f] are separate required elements of claim 1 (and Claim Elements 8[e] and 8[f] are separate required elements of claim 8), they are interrelated and will be discussed together for purposes of conciseness and ease of explanation herein. The Petition fails to establish that Koskinen would have rendered obvious these limitations.

As mentioned in Section VII(A)(1), Koskinen describes “[t]he timer's expiry value can be configured by radio resource control (RRC) at 350.” *Id.* at ¶39. The Petition alleges that “[b]ecause the UE includes a PDCP layer and is configured by RRC, POSITAs would have recognized and found obvious the RRC included a PDCP configuration information element.” Pet. at 22 (citing EX1003 at ¶¶147-148). The Petitioner acknowledges that “[Koskinen] does not explicitly describe a configuration IE field for the in-sequence timer...” but relies on Dr. Lo's conclusory

opinions to assert that “this limitation would have been obvious based on Koskinen’s teachings.” Pet. at 23-24 (citing EX1003 at ¶¶150-154). The Petitioner and Dr. Lo rely solely on broad teachings of RRC and its use of IEs in a general sense to leap to the conclusion that Koskinen renders obvious the specific requirements recited in claim 1; namely, the UE receives from the macro eNB an RRC message including a PDCP-configuration IE, which includes a field indicating a value of the in-sequence timer for a received PDCP SDU that sets a time period for receiving a missed PDCP SDU having a sequence number that is previous in sequence number to the received PDCP SDU. EX2012 at ¶¶ 120-121. This is wrong.

First, as explained above in Section VII(A)(1), Koskinen fails to render obvious the claimed in-sequence timer because Koskinen’s generalized proposal to “repurpose” RLC state variables for PDCP acknowledged-mode (AM) data transfer does not render obvious the claimed in-sequence timer for PDCP SDUs. EX2012 at ¶¶ 121-122. There is no specific teaching in Koskinen to support reconfiguring the RLC-based t-reordering timer for PDUs to instead be a PDCP-based in-sequence timer for a received PDCP SDU that sets a time period for receiving a missed PDCP SDU having a sequence number that is previous in sequence number to the received PDCP SDU. EX2012 at ¶122. Accordingly, Koskinen also fails to render obvious

that the RRC message includes a PDCP-configuration IE with a field indicating a value of the in-sequence timer.

Second, as Dr. Min explains in his attached declaration, Koskinen discloses repurposing of a t-reordering timer for RLC-UM to be for RLC-AM data transfer, but there is no disclosure that a PDCP-configuration IE is provided to the UE via RRC to indicate a value for the t-reordering timer. EX1005 at ¶ 37; EX2012 at ¶¶ 122-123. The Petitioner's and Dr. Lo's reliance on 3GPP TS 36.331 (EX1014) and 3GPP TS 36.322 (EX1013) is insufficient to bridge the far-reaching gap between Koskinen's t-reordering timer and the claimed PDCP-configuration IE including a field indicating a value of the in-sequence timer. *See* EX2012 at ¶¶ 122-123.

3GPP TS 36.331 describes an IE for *RLC-Config* “specify the RLC configuration of SRBs [signaling radio bearers] and DRBs [data radio bearers],” which includes a “T-Reordering” field. EX1014 at 219. 3GPP TS 36.322 describes unacknowledgement mode (UM) and acknowledgement mode (AM) data transfer procedures for RLC layer entities. EX1013 at 13-17. 3GPP TS 36.322 describes the transmit and receive operations procedures for the UM and AM RCL entities, including their use of a *t-reordering* timer. *Id.* However, Koskinen, 3GPP TS 36.322, and 3GPP TS 36.331 are directed to a timer (*t-reordering* timer) implemented at the

RLC layer and its related IE, **not** a timer (in-sequence timer) implemented at the PDCP layer and its related IE, as required by claim 1. EX2012 at ¶¶ 122-125. Koskinen's disclosure of "repurpose[ing]" an RLC-UM timer and related variables for AM data transfer falls short of teaching a POSITA to implement a PDCP-based in-sequence timer for a received PDCP SDU that sets a time period for receiving a missed PDCP SDU having a sequence number that is previous in sequence number to the received PDCP SDU, and therefore the Petitioner's alleged obviousness can be based only on hindsight reconstruction of Claim Elements 1[e] and 1[f]. EX2012 at ¶¶ 122-125.

For at least the foregoing reasons, Petitioner fails to show by a preponderance of the evidence that Claim Elements 1[e], 1[f], 8[e], and 8[f] would have been rendered obvious based on Koskinen.

3. Petitioner Fails to Establish That Claims 2 and 9 Would Have Been Obvious Based on Koskinen

Because claims 2 and 9 depend from claims 1 and 8, respectively, they include all of the limitations that Koskinen fails to teach with regard to the independent claims, as detailed *supra* §VI(A)(1)-(2). EX2012 at ¶¶ 126-127.

For at least the foregoing reasons, Petitioner fails to show by a preponderance

of the evidence that either claim 2 or 9 would have been rendered obvious based on Koskinen. EX2012 at ¶¶ 126-127.

4. Petitioner Fails to Establish That Claims 3 and 10 Would Have Been Obvious Based on Koskinen

Because claims 3 and 10 depend from claims 2 and 9 (and ultimately claims 1 and 8), respectively, they include all of the limitations that Koskinen fails to teach with regard to those claims, as detailed *supra* §VI(A)(1)-(3). EX2012 at ¶¶ 128-132.

In addition, similar to Claim Elements 1[c] and 8[a] discussed above in Section VI(A)(1), Koskinen fails to render obvious the specifically claimed “confirming whether there is a PDCP SDU of PDCP SN #n-1 which is missed notwithstanding obtaining a PDCP SDU of PDCP SN #n; and driving the in-sequence timer with respect to the PDCP SDU of PDCP SN #n when there is the PDCP SDU of PDCP SN #n-1 which is missed.” Koskinen does not teach “confirming” that a PDCP SDU has been missed. EX2012 at ¶¶ 131-132. Further, Koskinen does not teach that its reordering timer is a timer “with respect to the PDCP SDU of PDCP SN #n when there is the PDCP SDU of PDCP SN #n-1 which is missed.” EX2012 at ¶¶ 130-132. Koskinen describes “a timer, such as a reordering timer, can be started at 320 whenever a gap in the received protocol data units is

observed at 310, such as by observing a gap in a sequence of protocol data units.” EX1005 at ¶ 38; EX2012 at ¶¶ 130-132. However, Koskinen does not teach that this gap is confirmed, nor does it teach that the reordering timer is with respect to a PDCP SN #n when there is a PDCP SN #n-1 that is missed. EX2012 at ¶¶ 130-132.

For at least the foregoing reasons, Petitioner fails to show by a preponderance of the evidence that either claim 3 or 10 would have been rendered obvious based on Koskinen.

5. Petitioner Fails to Establish That Claims 4 and 12 Would Have Been Obvious Based on Koskinen

Because claims 4 and 12 depend from claims 3 and 10 (and ultimately claims 1 and 8), respectively, they include all of the limitations that Koskinen fails to teach with regard to those claims, as detailed *supra* §VI(A)(1)-(4). EX2012 at ¶¶ 133-139.

Koskinen does not disclose any functionality of delivering PDCP SDUs “to the upper layer according to the order of the PDCP SN” when “the PDCP SDU of PDCP SN #n-1 is obtained” prior to expiration of the “in-sequence timer for the PDCP SDU of PDCP SN #n,” as required by both claims 4 and 12 of the ’573 Patent. EX2012 at ¶ 135.

Indeed, Koskinen concerns setting the “reordering timer” and what happens

when it expires, not what happens when it does not expire. *See* EX2012 at ¶¶ 135-136. Thus, Koskinen is silent as to what may or may not occur when PDUs are received out of order prior to the expiration of the reordering timer.

Based largely on the conclusory testimony of Dr. Lo, Petitioner argues that “POSITAs would have recognized, at least in certain circumstances, the UE receives the missing PDCP PDU [] because the eNB has indicated the PDU was sent and the timer would not expire before it is received” and “[d]elivering consecutive PDCP PDUs without gaps is further disclosed in ‘embodiments in which both a timer and a forwarding-status report are included.’” Pet. at 30-31. But this is not sufficient. EX2012 at ¶¶ 136-138. Koskinen at paragraph 45 does not concern a universal aspect of its disclosures—it is clear that the disclosures are for “just one example embodiment”—and in this paragraph, reception of out-of-sequence SDUs is not disclosed, nor is any transmission prior to the expiration of Koskinen’s reordering timer. EX2012 at ¶¶ 136-138.

These claim elements concern both reordering received SDUs and delivery of them prior to the expiration of the in-sequence timer—Koskinen neither discloses nor renders obvious either of these aspects, and thus does not render obvious claims 4 or 12. EX2012 at ¶¶ 136-139.

For at least the foregoing reasons, Petitioner fails to show by a preponderance of the evidence that either claim 4 or 12 would have been rendered obvious based on Koskinen.

6. Petitioner Fails to Establish That Claims 5 and 11 Would Have Been Obvious Based on Koskinen

Because claims 5 and 11 depend from claims 2 and 10 (and ultimately claims 1 and 8), respectively, they include all of the limitations that Koskinen fails to teach with regard to those claims, as detailed *supra* §§VI(A)(1)-(4). EX2012 at ¶¶ 140-141.

For at least the foregoing reasons, Petitioner fails to show by a preponderance of the evidence that either claim 5 or 11 would have been rendered obvious based on Koskinen.

B. Ground 2: Sammour Does Not Cure the Deficiencies of Koskinen

Petitioner relies on Sammour to supply a single missing aspect of Koskinen's disclosures: Petitioner argues that "POSITAs would have been motivated to extend Koskinen to incorporate Sammour's 'flush timer' in Koskinen's RRC." See *generally* Pet. at 39-43. But the combination of Koskinen and Sammour as Petitioner describes would have been neither obvious nor result in each claim limitation of

independent claims 1 and 8 being obvious. *See* EX2012 at ¶¶ 142-149.

Even considering the “flush timer” disclosures of Sammour alongside the teachings of Koskinen would not render the claimed invention obvious. EX2012 at ¶¶ 144-145. Koskinen suggests that the reordering “timer's expiry value can be configured by radio resource control (RRC) at 350, and can be set at 360 long enough so that the timer does not expire during normal delivery delay of protocol data units sent by the eNB to the user equipment via a small-cell node, for example, including all possible HARQ and ARQ retransmissions at MAC and RLC level therein, respectively.” Koskinen at ¶ 39.

Sammour's “flush timer IE” fails to teach how its flush timer could be used to reconfigure Koskinen's reordering timer to achieve the claimed in-sequence timer, and thus would not be obvious to combine with Koskinen—or at least would not be obvious to combine to achieve the results proffered by Petitioner. EX2012 at ¶ 146. The “flush timer” of Sammour indicates whether to “stop reordering following handover,” and therefore is a handover-specific disclosure, which a POSITA would not reasonably look at in order to configure the “reordering timer” of Koskinen—there would simply be no reason to make this leap, and Petitioner offers none. EX2012 at ¶¶ 146-147. Sammour's flush timer is used during handover and is

triggered at the beginning of the handover, not triggered by any missing or otherwise out-of-sequence PDCP PDU(s). With reference to Table 8A of Sammour below, Dr. Min explains that the sequence number for the PDCP is for the PDU as an IE used by the PDCP entity in generating PDCP PDU. EX2012 at ¶ 147. The flush timer is used once per resource block during a handover and the flush timer would stop the reordering of previously received PDCP PDUs. EX2012 at ¶ 147.

TABLE 8A

Name	Semantics description
SN Length (or SN Size)	Indicates the length of the SN (e.g. 12 bits or 7 bits)

EX1006, Table 8A.

Sammour also does not disclose that the “PDCP Flush Timer IE” might indicate a time “long enough so that the timer does not expire during normal delivery delay of protocol data units sent by the eNB to the user equipment,” as Koskinen seeks to accomplish with its reordering timer. EX2012 at ¶¶ 146-147.

Dr. Lo provides little to no opinion or support for this position by Petitioner, and even testified that he has no opinion on what the flush timer does: “I don't have any opinion on what the flush timer, okay? Here it's not -- the point is not what the

timer does. To me it's not important here.” EX2013 at 102:6-9. This statement is telling, and shows the leap that Petitioner makes from what is actually taught by the references at issues to the claim limitations of the '573 Patent is guided by hindsight and not actual teachings from the references. EX2012 at ¶¶ 143-144.

Thus, consideration of the teachings of Sammour alongside Koskinen would not render obvious any of the challenged claims of the '573 Patent because the combination of these references that Petitioner proffers would not have been obvious.

C. Ground 3: Petitioner Fails to Establish That Claims 1-5 and 8-12 Would Have Been Obvious Based on Deenoo in view of Sammour

Petitioner has not shown a reasonable likelihood of prevailing on Ground 3 because the alleged combination would not have been obvious to a POSITA and fails to disclose or suggest key features of the '573 Patent's invention, as discussed in detail below. See EX2012 at § IX(C).

1. Petitioner Fails to Establish That Deenoo is Prior Art to the '573 Patent

As established in Section III, *supra*, the '573 Patent is entitled to its claimed priority date of May 10, 2013.

Conversely, Deenoo is not entitled to a priority date prior to May 10, 2013.

As recognized by the ID, the PCT application to which Deenoo claims priority was filed on January 17, 2014. ID at 20. And while Deenoo further claims priority to U.S. Provisional Applications 61/753,867 (filed January 17, 2013) and 61/811,233 (filed April 12, 2013), the citations relied upon by Petitioner do not find support in these provisional applications. EX2012 at ¶¶ 151-152.

The omission of paragraph 211 and Figure 8 of Deenoo in the priority applications is particularly striking. EX2012 at ¶¶ 153-154. Paragraph 211 and Figure 8 are relied upon by the Petition at pages 44 (overview of Deenoo), 55 (element [1.c]), 56 (element [1.d]), 60 and 62 (claim 3), and 64 (claim 5); they are also relied upon by Dr. Lo's declaration at ¶¶ 205, 231, 233, 247, 251, and 260.

But Dr. Lo does not provide any evidence for Petitioner's argument that "Figure 8 and paragraph 211 of Deenoo are based on and describe the sequence of events described in paragraphs 208-210 of Deenoo." See Paper 13 at 15. Indeed, both paragraph 211 and Figure 8 of Deenoo go beyond the teachings of paragraphs 208-210 of Deenoo. EX2012 at ¶ 154.

For example, Deenoo's disclosure that "[o]ne or more, or all, queued PDUs and/or advancing the PDCP receive window and/or canceling the re-ordering timer may be done, for example perhaps if the time to expiry for the reordering timer may

be less than a configured report threshold” (paragraph 211) is not disclosed in any of paragraphs 208-210 of Deenoo. EX2012 at ¶¶ 153-155.

2. Petitioner Fails to Establish Any Motivation to Combine Deenoo and Sammour

Petitioner asserts that a POSITA “would have been motivated to extend Deenoo to incorporate Sammour’s ‘flush timer’ configuration in Deenoo’s RRC.” Pet. at 45 (citing EX1003 at ¶¶206-212). Petitioner contends, without support from the references themselves, that “POSITAs would have been motivated to incorporate Sammour’s new PDCP reordering IEs in Deenoo to reliably configure Deenoo’s reordering timer when small cells are present with the macro cell and both sending data to the UE.” Pet. at 46 (citing EX1003 at ¶210).

But the combination of Deenoo and Sammour would not have been obvious to a POSITA, and instead is a result of impermissible hindsight reconstruction by Petitioner. EX2012 at ¶ 156.

The “flush timer IE” disclosures of Sammour considered with the teachings of Deenoo would not render obvious the claimed invention. EX2012 at ¶ 157. Deenoo describes PDCP re-ordering that may include starting a reordering timer when an out of sequence packet is received from an RLC entity. EX1007 at ¶211.

Deenoo states that “[a] PDCP status report may be transmitted, for example to trigger retransmission, perhaps in some embodiments if the time to expiry for the reordering timer may be more than a configured report threshold.” *Id.* Further, Deenoo provides that “queued PDUs and/or advancing the PDCP receive window and/or canceling the re-ordering timer may be done, for example perhaps if the time to expiry for the reordering timer may be less than a configured report threshold.” *Id.* However, as explained in more detail below, Deenoo does not teach an in-sequence timer for the PDCP SDUs in which the UE receives, via an RRC message, a PDCP-configuration information element (IE) indicating a value of the in-sequence via an RRC message timer, as required by the '573 Patent claims. EX2012 at ¶¶ 157-159. Petitioner purports to import Sammour's teachings into Deenoo to cure this deficiency.

But Sammour's “flush timer IE” does **not** disclose how Sammour's new PDCP reordering IEs could “reliably configure Deenoo's reordering timer when small cells are present with the macro cell and both sending data to the UE” as purported by Petitioner. Pet. at 46; EX2012 at ¶ 160. The “flush timer” of Sammour indicates whether to “stop reordering following handover,” and therefore is a handover-specific disclosure, which a POSITA would not look at to configure the “reordering timer” of Deenoo in the event of small cells and the macro cell both

sending data to the UE. EX2012 at ¶¶ 160-162. Sammour also does not disclose how to configure an expiration time of Deenoo's timer. *Id.*

Given these gaps in the teachings of Deenoo and Sammour, a POSITA would not have looked to Sammour to incorporate into Deenoo and achieve the claims elements, except through the use of improper hindsight reasoning. EX2012 at ¶¶ 158-162.

3. Petitioner Fails to Establish That Claim Elements 1[c] and 8[b] Would Have Been Obvious Based on Deenoo and Sammour

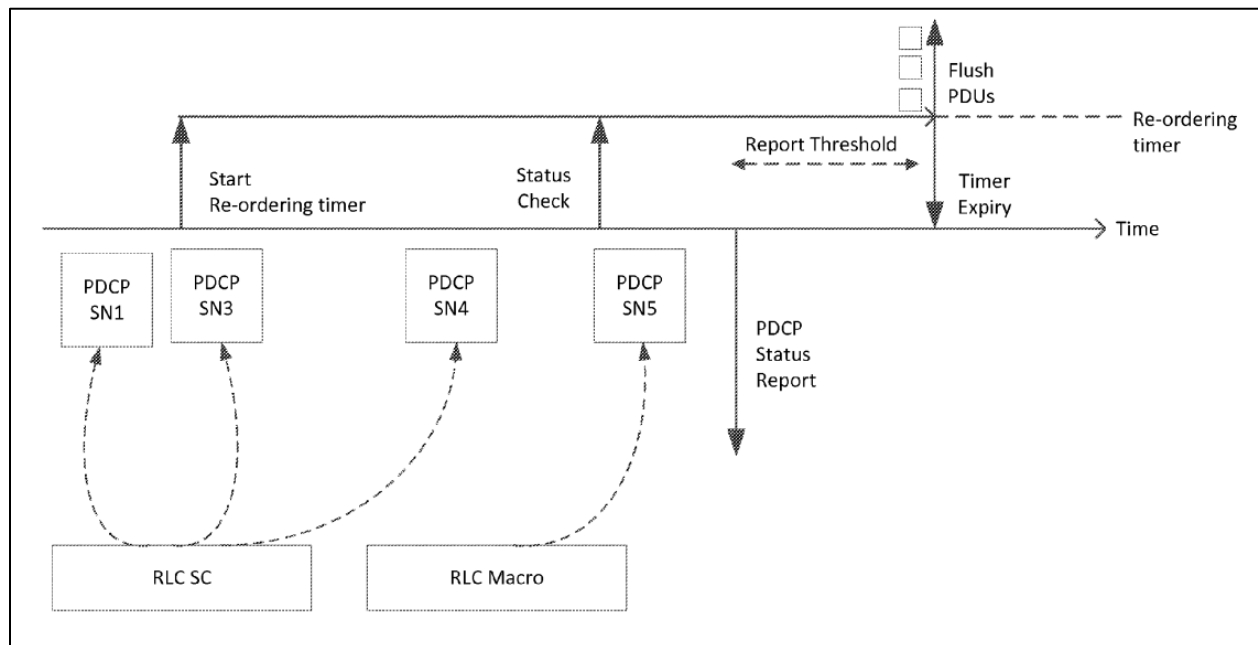
Petitioner attempts to compensate for overly broad and distinct teachings in Deenoo with further distinct teachings from Sammour to contend that Claim Elements 1[c] and 8[b] are rendered obvious; such distortion falls short of obviousness proven by the preponderance of the evidence. Claim Element 1[c] recites “receiving from the macro base station information related to ***an in-sequence timer for the PDCP SDUs through a radio resource control (RRC) message.***” (Emphasis added). Similarly, Claim Element 8[b] recites “receiving from the macro base station information related to ***in-sequence timer for the PDCP SDUs through a radio resource control (RRC) message.***” (Emphasis added). The Petition fails to establish that the alleged combination of Deenoo and Sammour would have rendered

obvious this limitation. EX2012 at ¶¶ 163-165.

Deenoo describes PDCP re-ordering during a handover or re-establishment. EX1007 at ¶205; EX2012 at ¶ 166. During a handover for the uplink transmission, “the source RLC (in source SCeNB) may forward the queued UL RLC SDUs (e.g. potentially out-of-order) to macro PDCP,” which “buffer[s] these PDCP PDUs” until macro PDCP receives “in order transmission from the UE in the target SCeNB.” *Id.* The macro PDCP also generates “a PDCP status report that may reflect the up-to-date status of the PDCP receiver in the macro [PDCP].” *Id.* During DL transmission, the UE RLC forwards “buffered DL RLC SDUs to the UE PDCP,” which “buffer[s] them until it may receive the transmission from target SCeNB.” EX1007 at ¶206; see EX2012 at ¶ 166.

Deenoo describes a “UE PDCP Receiver Operation” including a re-ordering algorithm. Petitioner relies on a re-ordering timer implemented in this re-ordering algorithm to purportedly render obvious the claimed in-sequence timer.

Deenoo also describes provides a representative sequence of triggers for status and the actions related to a reordering timer, which is shown in FIG. 8 (reproduced below).



EX1007, FIG. 8.

However, Petitioner appears to acknowledge the lack of support for their reliance on Deenoo's re-ordering timer, offering only a single conclusory sentence to state that a POSITA would have found the claimed in-sequence timer to be obvious in view of Deenoo's reordering timer: "POSITAs would have found obvious the RRC message to the UE in RRC CONNECTED mode would be used to set the duration of the reordering timer because the RRC message 'configure[s] the measurement parameters/events/triggers for the UE.'" Pet. at 54 (citing EX1003 at ¶228; Deenoo at ¶143); EX2012 at ¶¶ 166-168. Nothing in this statement, nor Dr. Lo's declaration, provides an explanation that shows how a POSITA would make

the leap from the broad, unrelated teachings of Deenoo to the claimed “receiving from the macro base station information related to an in-sequence timer for the PDCP SDUs through a radio resource control (RRC) message.” EX2012 at ¶¶ 166-168.

In fact, Dr. Lo's acknowledged at this deposition that he relies only on two quoted portions of Deenoo:

- “the macro cell may ‘send an RRC Connection reconfiguration to the UE with macro and/or the small cell configuration,’” and
- “[m]acro eNB may configure the measurement parameters/events/triggers for the UE in an RRC CONNECTED mode.”

See EX1003, ¶227; EX2013 at 108:17-109:23 (“essentially these two statements by Deenoo basically have all the information[] for a POSITA to go on and set up the timer information.”). Deenoo lacks the sufficient teachings to inform a POSITA how to achieve the claimed in-sequence timer. EX2012 at ¶ 168.

In apparent awareness of these flaws, Petitioner alternatively asserts that Sammour's flush timer IE teaches this claim element and would have been obvious to combine with Deenoo. EX2012 at ¶¶ 169. As explained above, a POSITA would

have not found it obvious to combine Deenoo and Sammour in the manner asserted by Petitioner to achieve the claimed elements. EX2012 at ¶ 169. Sammour provides little more than a general description of a “Reordering Stop Mode IE,” which “indicate[s] to the WTRU that the WTRU PDCP entity whether it should use the timer mechanism (e.g. Flush Timer) to stop reordering following handover, or whether it should use stop reordering after all stored PDCP SDUs have been delivered to upper layers.” EX1006 at ¶146; EX2012 at ¶ 170. Sammour also provides a brief description of a “Flush Timer IE,” which “indicate[s] to the WTRU the value of the flush timer that the WTRU should use to stop reordering for this RB.” *Id.* at ¶152; EX2012 at ¶ 170.

Deenoo's re-ordering timer and Sammour's flush timer do not teach “a timer that begins upon the detection of an out-of-sequence SDU and lasts for a period of time” (Patent Owner's proposed construction for an in-sequence timer). Instead, Deenoo discloses a “re-ordering timer” that starts “as soon as out of sequence PDCP Data PDU SN>N (from say RLC1/RLC2) is received,” and Sammour describes a “flush timer IE” that is used in a Reordering Stop Mode” to stop reordering “following handover” or “after all stored PDCP SDUs have been delivered to upper layers.” EX1007 at ¶¶208-211; EX1006 at ¶¶149, 152; EX2012 at ¶¶ 170-171.

Neither of these teachings, even if combined, render obvious an in-sequence timer in which the timer begins upon the detection of an out-of-sequence SDU and lasts for a period of time. Petitioner relies entirely on impermissible hindsight reconstruction of the claimed in-sequence timer. EX2012 at ¶¶ 170-171.

As mentioned above, during prosecution of the '573 Patent, the Applicant distinguished other forms of timers in the prior art, and the Examiner ultimately agreed each time. *See, e.g.*, EX1002 at 42 (distinguishing the “cell activation/deactivation timer” of Hong); *id.* at 128 (distinguishing the “discard timer” of Yi). The re-ordering timer of Deenoo and flush timer of Sammour are no different: they are not an in-sequence timer for PDCP SDUs based upon the detection of an out-of-sequence SDU. EX2012 at ¶ 172.

For at least the foregoing reasons, Petitioner fails to show by a preponderance of the evidence that Claim Elements 1[c] and 8[b] would have been rendered obvious based on the alleged combination of Deenoo and Sammour.

4. Petitioner Fails to Establish That Claim Elements 1[e] & 1[f] and 8[e] & 8[f] Would Have Been Obvious Based on Deenoo and Sammour

Claim Element 1[e] (and similarly Claim Element 8[e]) recites “wherein the RRC message includes a PDCP-configuration information element (IE)” and Claim

Element 1[f] (and similarly Claim Element 8[f]) recites “the PDCP-configuration IE includes a field indicating a value of the in-sequence timer.” Similar to Ground 1 above, although Claim Elements 1[e] and 1[f] are separate required elements of claim 1 (and Claim Elements 8[e] and 8[f] are separate required elements of claim 8), they are interrelated and will be discussed together for purposes of conciseness and ease of explanation herein. Petitioner fails to establish by the preponderance of the evidence that the alleged combination of Deenoo and Sammour would have rendered obvious these limitations. EX2012 at ¶¶ 174-176.

The Petitioner and Dr. Lo rely on broad teachings of RRC and its use for communicating RRC parameters, including IEs, to leap to the conclusion that Deenoo and Sammour render obvious the specific requirements recited in claim 1; namely, the UE receives from the macro eNB an RRC message including a PDCP-configuration IE, which includes a field indicating a value of the in-sequence timer for a received PDCP SDU that sets a time period for receiving a missed PDCP SDU having a sequence number that is previous in sequence number to the received PDCP SDU. EX2012 at ¶ 177. However, Sammour and Deenoo, either individually or in combination, fail to teach the use of sequence numbers for the PDCP SDUs. EX2012 at ¶ 177.

Further, as explained above in Section VII(C)(3), Deenoo and Sammour, either individually or together, fail to render obvious the claimed in-sequence timer because Deenoo's re-ordering timer and Sammour's flush timer do not teach "a timer that begins upon the detection of an out-of-sequence SDU and lasts for a period of time" (Patent Owner's proposed construction for an in-sequence timer). EX2012 at ¶ 178. Accordingly, Deenoo and Sammour fail to render obvious that an in-sequence timer, for which an RRC message is received by the UE that includes a PDCP-configuration IE with a field indicating a value of the in-sequence timer, as recited in Claim Elements 1[e], 1[f], 8[e], and 8[f]. *Id.*

In addition, Deenoo states that "the Macro eNB may configure the measurement parameters/events/triggers for the UE in an RRC CONNECTED mode [and] [t]he UE may send the measurement report when the configured reporting criterion is satisfied." EX1007 at ¶143. This simply describes to a POSITA that some unspecified information may be configured for the UE by the eNB via RRC messaging, which is a well-known concept in 3GPP that lacks any of the specific detail recited in the claims for configuring an in-sequence timer for the PDCP SDUs. EX2012 at ¶ 179.

Sammour is not much better: it provides a general description of a

“Reordering Stop Mode IE” that indicates “to the WTRU that the WTRU PDCP entity whether it should use the timer mechanism (e.g. Flush Timer)” and a “Flush Timer IE” that indicates “to the WTRU the value of the flush timer that the WTRU should use to stop reordering for this RB.” *Id.* at ¶¶148-152; EX2012 at ¶ 180. Both of which may be provided in RRC messages. *Id.* at ¶¶148-153; EX2012 at ¶ 180. However, neither Deenoo nor Sammour teaches a POSITA to implement a PDCP-based in-sequence timer for a received PDCP SDU that sets a time period (signaled via a PDCP-configuration IE) for receiving a missed PDCP SDU having a sequence number that is previous in sequence number to the received PDCP SDU. EX2012 at ¶¶ 180-181. Accordingly, Deenoo and Sammour fail to render obvious that the RRC message includes a PDCP-configuration IE with a field indicating a value of the in-sequence timer, as recited in Claim Elements 1[e], 1[f], 8[e], and 8[f]. EX2012 at ¶¶ 180-181. Petitioner’s alleged obviousness can be based only on hindsight reconstruction of Claim Elements 1[e], 1[f], 8[e], and 8[f]. EX2012 at ¶ 182.

For at least the foregoing reasons, Petitioner fails to show by a preponderance of the evidence that Claim Elements 1[e], 1[f], 8[e], and 8[f] would have been rendered obvious based on the alleged combination of Deenoo and Sammour.

5. Petitioner Fails to Establish That Claims 2 and 9 Would Have Been Obvious Based on Deenoo and Sammour

Because claims 2 and 9 depend from claims 1 and 8, respectively, they include all of the limitations that the alleged combination of Deenoo and Sammour fails to teach with regard to the independent claims, as detailed *supra* §VI(C)(2)-(4). EX2012 at ¶¶ 183-184.

For at least the foregoing reasons, Petitioner fails to show by a preponderance of the evidence that either claim 2 or 9 would have been rendered obvious based on the alleged combination of Deenoo and Sammour.

6. Petitioner Fails to Establish That Claims 3 and 10 Would Have Been Obvious Based on Deenoo and Sammour

Because claims 3 and 10 depend from claims 2 and 9 (and ultimately claims 1 and 8), respectively, they include all of the limitations that the alleged combination of Deenoo and Sammour fails to teach with regard to those claims, as detailed *supra* §VI(C)(2)-(5). EX2012 at ¶¶ 185-188.

In addition, similar to Claim Elements 1[c] and 8[b] discussed above, Deenoo and Sammour fail to render obvious the specifically claimed “confirming whether there is a PDCP SDU of PDCP SN #n−1 which is missed notwithstanding obtaining a PDCP SDU of PDCP SN #n; and driving the in-sequence timer with respect to the

PDCP SDU of PDCP SN #n when there is the PDCP SDU of PDCP SN #n-1 which is missed.” Deenoo and Sammour do not teach “confirming” that a PDCP SDU has been missed. EX2012 at ¶ 187. Further, Deenoo and Sammour fail to teach that either the reordering or flush timer is a timer “with respect to the PDCP SDU of PDCP SN #n when there is the PDCP SDU of PDCP SN #n-1 which is missed.” EX2012 at ¶ 187.

For at least the foregoing reasons, Petitioner fails to show by a preponderance of the evidence that either claim 3 or 10 would have been rendered obvious based on the alleged combination of Deenoo and Sammour. EX2012 at ¶ 188.

7. Petitioner Fails to Establish That Claims 4 and 12 Would Have Been Obvious Based on Deenoo and Sammour

Because claims 4 and 12 depend from claims 3 and 10 (and ultimately claims 1 and 8), respectively, they include all of the limitations that the alleged combination of Deenoo and Sammour fails to teach with regard to those claims, as detailed *supra* §VI(C)(2)-(6). EX2012 at ¶¶ 189-192.

Deenoo and Sammour do not disclose any functionality of delivering PDCP SDUs to the upper layer “according to the order of the PDCP SN” when “the PDCP SDU of PDCP SN #n-1 is obtained” prior to expiration of the “in-sequence timer

for the PDCP SDU of PDCP SN #n,” as required by claims 4 and 12. EX2012 at ¶ 191. These claim elements concern both reordering received SDUs and delivery of them prior to the expiration of the in-sequence timer. *Id.* Deenoo and Sammour are both silent as to what may or may not occur when PDUs are received out of order prior to the expiration of the reordering timer. *Id.*

For at least the foregoing reasons, Petitioner fails to show by a preponderance of the evidence that either claim 4 or 12 would have been rendered obvious based on the alleged combination of Deenoo and Sammour.

8. Petitioner Fails to Establish That Claims 5 and 11 Would Have Been Obvious Based on Deenoo and Sammour

Because claims 5 and 11 depend from claims 2 and 10 (and ultimately claims 1 and 8), respectively, they include all of the limitations that the alleged combination of Deenoo and Sammour fails to teach with regard to those claims, as detailed *supra* §§VI(C)(2)-(7). EX2012 at ¶¶ 193-194.

For at least the foregoing reasons, Petitioner fails to show by a preponderance of the evidence that either claim 5 or 11 would have been rendered obvious based on Deenoo and Sammour.

VIII. CONCLUSION

For at least the foregoing reasons, the Director should deny institution of the Petition.

Dated: January 7, 2026

Respectfully submitted,

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IPR2025-00762
Patent No. 10,863,573
Patent Owner's Response

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CERTIFICATE OF SERVICE

I hereby certify that on this January 7, 2026, a copy of the attached **PATENT OWNER'S RESPONSE** was served by electronic mail to the attorneys of record, at the following addresses:

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IPR2025-00762
Patent No. 10,863,573
Patent Owner's Response

CERTIFICATION PURSUANT TO 37 C.F.R. § 42.24(d)

Pursuant 37 CFR 42.24(d), the undersigned certifies that this Patent Owner's Response complies with the type-volume limitation of 37 CFR § 42.24(a). The word count application of the word processing program used to prepare this Patent Owner's Response indicates that the Response contains 11,512 words, excluding the parts of the brief exempted by 37 C.F.R. § 42.24(a).

Respectfully submitted,

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