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Paper 48
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

M & K HOLDINGS INC.,
Patent Owner.

Case IPR2018-00696
Patent 9,113,163 B2

Before KARL D. EASTHOM, MELISSA A. HAAPALA, and SHARON FENICK, *Administrative Patent Judges*.

EASTHOM, *Administrative Patent Judge*.

DECISION
Final Written Decision
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Petitioner, Samsung Electronics Co., Ltd., filed a Petition for *inter partes* review of claims 1–6 (the "challenged claims") of U.S. Patent No. 9,113,163 B2 (Ex. 1001, "'163 patent"). Paper 1 ("Pet."). Patent Owner, M & K Holdings, Inc., filed a Preliminary Response. Paper 6. The parties filed additional briefing on an issue of collateral estoppel. Papers 8, 9. Petitioner also filed supplemental information related to the public availability of asserted prior art. *See* Paper 16 (Motion to Submit Supplemental Information, including Exhibits 1078–1087); Paper 22 (Decision on Petitioner's Motion to Submit Supplemental Information).

After we instituted trial on the challenged claims (Paper 11, "Institution Decision" or "Inst. Dec."), Patent Owner filed a Response (Paper 24, "PO Resp."), Petitioner filed a Reply to Patent Owner's Response (Paper 26, "Reply")), and Patent Owner filed a Sur-Reply to Petitioner's Reply (Paper 31, "PO Sur-Reply"). The parties filed other Motions related to the exclusion of evidence as discussed below. *See* Papers 33, 38, 39. A court reporter transcribed the Oral Hearing of June 11, 2019. Paper 47 ("Tr."). The Oral Hearing involved two other related cases between the parties, IPR2018-00697 and IPR2018-00698. After the Oral Hearing, the parties filed additional briefing to address an issue of collateral estoppel and the impact of *Samsung Electronics Co., Ltd. v. Infobridge Pte. Ltd.*, 929 F.3d 1363 (Fed. Cir. 2019), which issued after the Oral Hearing. Papers 43–46; Ex. 3003.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision issues under 35 U.S.C. § 318(a). For the reasons discussed below,

Petitioner has demonstrated by a preponderance of the evidence that claims 1–6 of the '163 patent are unpatentable.

A. Related Matters

Petitioner filed several petitions challenging patents related to the '163 patent. Pet. 1–2. Specifically, Petitioner filed petitions challenging claims in related patents in Cases IPR2017-00099 (final written decision issued), IPR2017-00100 (final written decision issued), IPR2017-00101 (institution denied), IPR2017-00102 (institution denied), IPR2018-00092 (final decision), IPR2018-00093 (final decision), IPR2018-00094 (final decision), IPR2018-00095 (final decision), IPR2017-00101 (institution denied), IPR2017-00102 (institution denied), IPR2018-00011 (final decision), IPR2018-00012 (final decision), IPR2018-00697 (final decision pending), and IPR2018-00698 (final decision pending). *See* Pet. 1–2; Paper 4, 1; Paper 36.

B. The '163 Patent

The '163 patent involves an image compression method. *See* Ex. 1001, 1:24–25. According to the '163 patent,

> [i]n image compression methods such as Motion Picture Experts Group (MPEG)-1, MPEG-2, MPEG-4 and H.264/MPEG-4 Advanced Video Coding (AVC), one picture is divided into macroblocks to encode an image. Then, the respective macroblocks are encoded using inter prediction or intra prediction.

Id. at 1:24–29.

The '163 patent also relates to a motion compensation method known as a high efficiency video coding ("HEVC") method or standard (as described further below). *See id.* at 4:33–37. In particular, the '163 patent claims challenged here "relate[] to a method of decoding a moving picture in

inter prediction mode." *Id.* at 1:16–17. "In inter prediction, a motion estimation is used to eliminate temporal redundancy between consecutive pictures." *Id.* at 1:30–31.

"[O]ne or more reference pictures are used to estimate [temporal] motion of a current block . . . ." *Id.* at 1:32–33. "A motion vector indicating the difference between the current block and the similar block of the reference picture is needed to correctly decode the inter-coding block. Thus, the motion information should be inserted in a bit stream." *Id.* at 1:41–45; *see also id.* at 1:46–52 (disclosing that "a motion vector predictor is generated using motion vectors of neighboring block[s]"). The '163 patent discloses that "if a motion of the current block is different [from] motions of the neighboring blocks, the coding efficiency of the motion vector degrades." *Id.* at 1:55–57. Accordingly, the '163 patent describes a need for "a new method of encoding a motion vector . . . when the motion of image is little or steady or the image to be encoded is a background image." *Id.* at 1:57–60.

The method involves dividing a picture into a plurality of slices, with each slice divided into a plurality of largest coding units (LCUs), each with a position indicated by an address indicator. *Id.* at 2:45–47. "Each coding unit[] consists of one or more prediction units." *Id.* at 2:53. The method involves "decoding a motion vector of a current prediction unit using one of [the] motion vectors of spatially and temporally neighboring prediction unit[s]." *Id.* at 1:64–67.

The motion vector prediction mode procedure includes creating a reconstructed block using a residual block and a prediction block, including the following steps (*id.* at 15:42–44):

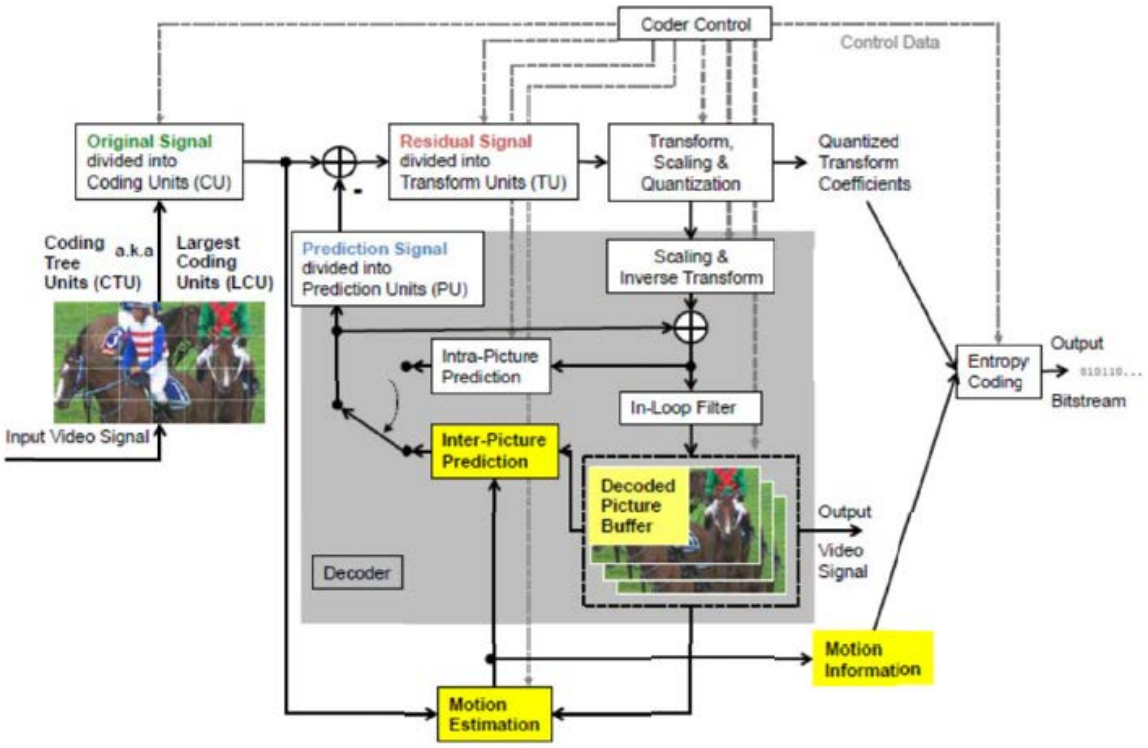
> First, a reference picture index and a motion vector difference of a current prediction unit is obtained from a prediction unit syntax of the received bit stream. . . .
>
> Next, motion vector prediction is determined. The motion vector predictor is selected among spatial motion vector candidates and temporal motion vector candidate.
>
> . . . .
>
> A spatial left motion vector candidate block may be one of left prediction units (blocks A_o and A_1) of a current block. A spatial above motion vector candidate block may be one of above prediction units (blocks B_o, B_1 and B_2) of the prediction unit.
>
> . . . .
>
> If there is not a prediction unit satisfying any one [of described] conditions [above, *see id.* at 16:11–50], the spatial left motion vector candidate is unavailable.
>
> It is checked whether there is a prediction unit satisfying the first conditions or the second conditions when retrieving the above blocks in the order of blocks B_o, B_1 and B_2. If there is a prediction unit satisfying the first conditions or the second conditions, the motion vector of the prediction unit is determined as the spatial above motion vector candidate.
>
> A temporal motion vector candidate is the same as the motion vector of the temporal skip candidate.
>
> Next a motion vector candidate list is constructed. The motion vector candidate list is constructed using available spatial and temporal motion vector candidates. The motion vector candidate list may be constructed in a predetermined order. The predetermined order is the order of a spatial left motion vector candidate, a spatial above motion vector candidate and a temporal motion vector candidate, or the order of a temporal motion vector candidate, a spatial left motion vector candidate and a spatial above motion vector candidate.
>
> The predetermined order may be changed or one or more motion vector candidates are excluded from the motion vector candidates according to a prediction mode of the prediction unit.
>
> Next, if a plurality of candidates have [the] same motion vector, the candidate having lower priority is deleted in the motion vector candidate list. If the number of motion vector candidates

> in the list is smaller than a predetermined number, a zero vector is added.
>
> Next, a motion vector predictor of the current prediction unit is obtained. The motion vector candidate indicated by the motion vector index is determined as the motion vector predictor of the current prediction unit.
>
> Next, a motion vector of the current prediction unit is generated by adding the motion vector difference and the motion vector predictor. And a prediction block is generated using the received reference picture index and the restored motion vector[.]
>
> Also, a residual block is restored through entropy decoding, inverse scan, inverse quantization and inverse transform. The procedure is performed by the entropy decoding unit 210, the inverse scanning unit 221, the inverse quantization unit 222 and the inverse transform unit 223 of the decoding apparatus of FIG. 3.
>
> Finally, a reconstructed block is generated using the prediction block and the residual block[.]

Id. at 15:46–17:30.

Mr. Benjamin Bross, Petitioner's expert, refers to the above-discussed process as a motion vector prediction (MVP) mode of encoding and decoding. *See* Ex. 1002 ¶ 28. Mr. Bross contends that HEVC standards, disclosed in the '696 patent (Ex. 1001, 4:33–37), and described in WD4-v3 (*see infra* note 2), include the MVP mode. *See id.* ¶ 29.

Mr. Bross provides the following Demonstrative A as an aid to understanding the process of the '163 patent (*see* Ex. 1002 ¶¶ 29–31):



DEMONSTRATIVE A

The encoding process as represented in Demonstrative A, depicted above, involves creating spatial subdivision regions from original picture frames, called largest coding units, dividing those into coding units (CUs), further dividing those CUs into prediction units of a current picture, creating related prediction units for storage and feedback as reference pictures, creating a residual signal of transform units as a difference of the two sets of prediction units, and then transforming, scaling and quantizing the transform units. *See* Ex. 1002 ¶¶ 31–34 (citing Ex. 1005; Ex. 1010).[1]

[1] Exhibit 1010 describes the basic system represented Demonstrative A. Demonstrative A provides background for basic features of known encoding systems prior to the date of the invention. *See* Ex. 1002 ¶¶ 31–34; Ex. 1010, 10.

The basic process represented in Demonstrative A tracks the basic process of the encoder and internal decoder as represented by Figure 2 of the '163 patent in material respects, at least for purposes of understanding the disclosed invention. *See* Ex. 1001, Fig. 2, 2:43–3:14 (describing prediction units and transform units as part of the encoding process); *see also id.* at Fig. 3 (decoder). Similar to the '163 patent, the encoder of Demonstrative A includes a decoder or some decoder functionality.

As Demonstrative A indicates, the output includes motion information and processed TUs (transform units) (encoded, transformed, etc.) to form an output bitstream to be decoded at the decoder. *See* Ex. 1002 ¶¶ 31–34. At both the decoder and encoder, the process involves adding the prediction signal (or PUs) to decoded TUs to generate a reconstructed signal (which the encoder uses as a reference picture to create subsequent prediction units of subsequent pictures (i.e., inter-picture prediction)). *See id.* ¶ 34.

Mr. Bross also explains, in reference to Demonstrative A, that "[s]ubtracting the prediction signal from the original signal generates the **residual signal**. Accordingly, the residual signal corresponds to the prediction error, i.e., when the prediction is perfect, the residual signal would be equal to zero." Ex. 1002 ¶ 33 (citing Ex. 1010, 567, Fig. 8). At the decoder, "[t]he prediction signal is added again [to the decoded TUs of the residual signal] to generate the reconstructed signal, i.e., the original signal with a quantization error is obtained." *Id.* ¶ 34 (Ex. 1010, 567, Fig. 8). Mr. Bross also explains that sending a motion vector difference (MVD) does not involve sending the MV itself: "Instead, only a motion vector

difference (MVD) and a motion vector predictor index are coded and transmitted to the decoder." *Id.* ¶ 37 (citing Ex. 1005, 49–50, 120–21).

C. Illustrative Claim

Petitioner challenges all claims (i.e., claims 1–6) of the '163 patent. Independent claim 1 illustrates the claimed subject matter:

> 1. [a] A method of decoding a moving picture, comprising:
>
> [b] a step of generating a prediction block of a current prediction unit; and
>
> [c] a step of generating a residual block of the current prediction unit,
>
> [d] wherein the step of generating a prediction block of the current prediction unit comprises the steps of
>
> [e] obtaining a reference picture index and motion vector difference of the current prediction unit from a received bit stream;
>
> [f] constructing a motion vector candidate list using available spatial and temporal motion vector candidates;
>
> [g] adding zero vector to the motion vector candidate list if a number of the available motion vector candidates is smaller than a predetermined number;
>
> [h] determining a motion vector candidate indicated by a motion vector index as a motion vector predictor and restoring a motion vector of the current prediction unit using the motion vector difference and the motion vector predictor; and
>
> [i] generating a prediction block of the current prediction unit using the restored motion vector and the reference picture index,
>
> [j] wherein the temporal motion vector candidate is a first available motion vector encountered when retrieving two blocks corresponding to the current prediction unit or a motion vector of a predetermined block.

Ex. 1001, 17:2–18:17 (reference letters added to track Petitioner's nomenclature designating limitations a–j).

D. Asserted Grounds of Unpatentability

Petitioner asserts that WD4-v3[2] anticipates claims 1, 2, 5 and 6 of the '163 patent under 35 U.S.C. § 102(a); the combination of WD4-v3 and Park[3] renders claim 2 obvious under 35 U.S.C. § 103(a); and the combination of WD4-v3, Park, and Zhou[4] renders claims 3 and 4 obvious under 35 U.S.C. § 103(a). Pet. 3–4. Petitioner relies on Mr. Bross's Declaration (Ex. 1002), Dr. Vetro's Declaration (Ex. 1058), and Mr. Bross's Supplemental Declaration (Ex. 1078). Patent Owner relies on Dr. Kalva's Declaration (Ex. 2025).

II. DISCUSSION

A. Claim Construction

In an *inter partes* review filed before November 13, 2018, the Board construes claim terms in an unexpired patent according to their broadest reasonable construction in light of the specification of the patent in which

[2] Benjamin Bross et al., *WD4: Working Draft 4 of High-Efficiency Video Coding*, JCTVC-F803 (version 3) (uploaded Sept. 8, 2011) (Ex. 1005).
[3] Park et al., *Modifications of Temporal MV Memory Compression and Temporal MV Predictor*, JCTVC-E059 (version 4) (uploaded March 19, 2011) (Ex. 1006).
[4] Minhua Zhou, *Non-CEP9: Modified H Position for Memory Bandwidth Reduction in TMVP Derivation*, JCTVC-G082 (version 1) (uploaded Nov. 9, 2011) (Ex. 1007).

they appear.[5] 37 C.F.R. § 42.100(b) (2017); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Under that standard, "words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history." *Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1062 (Fed. Cir. 2016).

No terms require an express construction. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (noting that "we need only construe terms 'that are in controversy, and only to the extent necessary to resolve the controversy'") (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

B. Level of Ordinary Skill in the Art

We adopt Petitioner's proposed level of ordinary skill in the art, which follows:

> A person of ordinary skill in the art ("POSITA") at the time of the alleged invention of the '163 patent would have had at least a B.S. degree in electrical engineering, or equivalent thereof, and at least three to four years of experience in the relevant field, which includes video coding technology, or an M.S. degree in electrical engineering and at least two to three years of experience with video coding technology. (Ex. 1002, ¶¶21–22; *id.*, ¶¶18–20.) More education can supplement practical experience and vice versa. (*Id.*)

[5] A recent amendment to this rule does not apply here because the Petition was filed before November 13, 2018. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018).

See Pet. 4–5. Dr. Kalva, Patent Owner's expert, generally agrees with Petitioner and Mr. Bross, Petitioner's expert. *See* Ex. 2025 ¶ 17 ("While the credentials described by Mr. Bross could qualify one as a POSITA, . . . other definitions of a POSITA . . . would be acceptable as long as the POSITA's credentials reflect a practical understanding of the design considerations and challenges associated with the video coding technology at issue in the '163 Patent."). No material dispute exists over the level of ordinary skill, and the prior art of record supports Petitioner's proposed level of ordinary skill. *See infra* § II.C.4–6 (summarizing WD4-v3, Zhou, and Park).

C. Asserted Challenges Based on WD4-v3, Park, and Zhou

As noted above, Petitioner asserts that WD4-v3 anticipates claims 1, 2, 5, and 6 of the '163 patent under 35 U.S.C. § 102(a); the combination of WD4-v3 and Park renders claim 2 obvious under 35 U.S.C. § 103(a); and the combination of WD4-v3, Park, and Zhou renders claims 3 and 4 obvious under 35 U.S.C. § 103(a). Pet. 3–4, 26–68. Petitioner also cites Park II[6] "to show the knowledge of a POSITA at the time of the alleged invention," contending Park II pre-dates the effective filing date of the '163 patent. *Id.* at 17 n.5, 24–25.[7] Patent Owner does not challenge Petitioner's unpatentability contentions substantively other than challenging whether WD4-v3, Park, and Zhou constitute printed publications. *See* PO Resp. 2–5

[6] Park et al., *CE1: Results on a Selection of the Representative Motion Data (A3, A.7, A.9 and A.11)*, JCTVC-F112, (version 1) (uploaded July 1, 2011) (Ex. 1008).

[7] Petitioner relies on Park II only to corroborate its showing with respect to claim 3 and 4, and Petitioner shows the obviousness of claims 3 and 4 without Park II. *See infra* § II.C.10.

(summarizing arguments). For the reasons discussed below, Petitioner supports its challenges by a preponderance of evidence.

1. Effective Filing Date of the '163 Patent

As an initial matter, Petitioner contends that WD4-v3, Park, and Zhou, constitute prior art to the '163 patent under 35 U.S.C. § 102(a). *See* Pet. 3–4, 22–32. Petitioner contends that December 13, 2011, represents the earliest possible effective filing date of the claims of the '163 patent, based on the filing date of the '163 patent's parent application, the PCT/KR2011/009562 application. Pet. 15–16; Ex. 1001, [63].

Relying on certified English translations of the two Korean priority applications for the '163 patent, Korean Patent application No. 10-2011-0064312 ("'312 Korean application" Ex. 1013)) and Korean Patent application No. 10-2010-0127663 (the "'663 Korean application" (Ex. 1014)), Petitioner contends they do not "provide adequate written support for at least 'adding zero vector to the motion vector candidate list if a number of the available motion vector candidates is smaller than a predetermined number," as recited in claim 1. Pet. 15–16 (citing Ex. 1001, 18:3–5; Ex. 1002 ¶¶ 61–62; Ex. 1013 ¶¶ 345–346; Ex. 1014 ¶¶ 145–156)). Petitioner explains that the cited paragraphs of the '312 Korean application and the '663 Korean application respectively relate to an "MV candidate list" and a "motion vector list," but they fail to describe adequately "adding zero vector to the motion vector candidate list if a number of the available motion vector candidates is smaller than a predetermined number." *See id.* at 16 (citing Ex. 1002 ¶ 63).

Petitioner shows persuasively December 13, 2011, constitutes the effective filing date of the '163 patent on this record. Patent Owner does not challenge this effective filing date in its Response.

2. Collateral Estoppel

The final written decisions in IPR2017-00099 (Exhibit 2001) and IPR2017-00100 (Ex. 2002) involve printed publication issues similar to those presented here. *See Samsung Electronics Co., Ltd. v. Infobridge PTE Ltd.*, Case IPR2017-00099, slip op. at 7–27 (PTAB Apr. 23, 2018) (holding petitioner failed to show prior art references relied upon to show unpatentability qualify as printed publications) (Paper 32); *Samsung Electronics Co., Ltd. v. Infobridge PTE Ltd.*, IPR2017-00100, slip op. at 8–27 (PTAB Apr. 23, 2018) (same) (Paper 30) (collectively "*Infobridge* IPRs" or "*Infobridge* FWDs" depending on the context). After the Oral Hearing in this proceeding, our reviewing court issued a decision in appeals of the two *Infobridge* FWDs. *Infobridge*, 929 F.3d at 1374–75 (vacating and remanding for the Board to consider the public accessibility question) ("*Infobridge*" or "Federal Circuit's *Infobridge* decision"). As noted above, the parties filed additional briefing to address the impact of the Federal Circuit's *Infobridge* decision. *See* Paper 43 ("PO IB Br."); Paper 44 ("Pet. IB Br."); Paper 45 ("PO IB Rep. Br."); Paper 46 ("PO IB Rep. Br.").

Patent Owner's Response contends "should the [Federal Circuit] affirm the Final Written Decisions of the *Infobridge* IPRs finding that WD4-v4 does not qualify as a printed publication, collateral estoppel will attach here." PO Resp. 32–33 (stating that WD4-v3 and WD4-v4 present the same issue regarding whether the references qualify as prior art). *See MaxLinear, Inc. v. CF CRESPE LLC*, 880 F.3d 1373, 1376 (Fed. Cir. 2018); *Bettcher*

Indus., Inc. v. Bunzl USA, Inc., 661 F.3d 629, 648 (Fed. Cir. 2011) ("[T]he estoppel provision of [the prior reexamination version of] 35 U.S.C. § 315(c) applies only after all appeal rights are exhausted, including appeals to [the Federal Circuit].")). Petitioner agrees that a necessary condition for collateral estoppel to apply requires an affirmance by the Federal Circuit of the *Infobridge* FWDs. *See* Reply 19–10.

In *Infobridge*, the Federal Circuit remanded the *Infobridge* FWDs for further fact finding by the Board to determine, *inter alia*, if circumstances underlying an email by Mr. Bross show public accessibility on that record, fact finding that relates to the public accessibility of WD4-v3 here, albeit on a different factual record. *See Infobridge*, 929 F.3d 1375 ("[W]e are reluctant to assume that an email among potential collaborators should be treated the same as a public disclosure without clear findings by the Board."); *id.* at 1374–75 (remanding to the Board to "consider[] whether Samsung's evidence established that an ordinarily skilled artisan could have accessed the WD4 reference, after exercising reasonable diligence, based on the listserv email").

Patent Owner argues that the Federal Circuit's *Infobridge* decision provides the basis for collateral estoppel on the issue of whether WD4-v3 was publicly accessible. *See* PO IB Br. 3. However, the case here includes different evidence than the *Infobridge* IPRs. For example, the instant proceeding includes testimony in Mr. Bross's Supplemental Declaration (Ex. 1078), IDS filings listing JCT-VC documents at the PTO and other evidence of accessibility of JCT-VC documents (Exs. 1080–1083; Ex. 1087), and evidence about searching titles on the JCT-VC server (Ex. 1002; Ex. 1058; Ex. 1078), none of which the Federal Circuit's

Infobridge decision considers. *See* PO IB Br. 3 (discussing title search functionality; citing Ex. 2026, 135:20–136:14 (Mr. Bross's deposition); Exs. 1080–1084 (evidence related to JCT-VC document accessibility)).

In addition to the Federal Circuit's *Infobridge* decision, several other cases clarifying the law of public accessibility issued subsequent to the *Infobridge* FWDs. *See Medtronic, Inc. v. Barry*, 891 F.3d 1368, 1382–83 (Fed. Cir. 2018); *Jazz Pharm. Inc. v. Amneal Pharm., LLC*, 895 F.3d 1347, 1358 (Fed. Cir. 2018); *GoPro v. Contour IP Holding*, 908 F.3d 690, 694 (Fed. Cir. 2018).

"Collateral estoppel, also known as issue preclusion, shields a defendant from having to litigate issues that have been fully and fairly tried in a previous action and decided adversely to a party." *Pharmacia & Upjohn Co. v. Mylan Pharm., Inc.*, 170 F.3d 1373, 1379 (Fed. Cir. 1999). According to the Federal Circuit, "*affirmance* [of the Board's decision] *renders final a judgment* of invalidity of the" patent under review by the Board. *XY, LLC v. Trans Ova Genetics, L.C.*, 890 F.3d 1282, 1294 (Fed. Cir. 2018) (emphasis added). Further, "*an affirmance of an invalidity finding*, whether from a district court or the Board, *has a collateral estoppel effect* on all pending or co-pending actions." *Id.* (emphasis added)). In *Trans Ova Genetics*, *see id.*, the court cited and relied on *MaxLinear*, in which the court similarly reasoned as follows: "Both parties agree that those prior decisions, *having been affirmed by our court, are binding in this proceeding, as a matter of collateral estoppel*, and they could hardly argue otherwise." *MaxLinear*, 880 F.3d at 1379 (emphasis added).

The reasoning in *Trans Ova Genetics* and *MaxLinear* quoted above indicates that collateral estoppel does not apply to the remand involved in

Infobridge. Based on the remand by *Infobridge*, different evidentiary records, the lack of identical issues, and the recent precedent clarifying public accessibility issues, Petitioner persuasively argues collateral estoppel does not apply. *See* Pet. IB Br. 1 ("The Federal Circuit's clarification of the proper legal standard on public accessibility supports a finding of printed publication based on the evidentiary record developed in this proceeding for all three of the asserted references: *WD4-v3*, *Park*, and *Zhou*."); Reply 19–20 (arguing collateral estoppel does not apply). Accordingly, we conclude collateral estoppel does not apply.

3. Printed Publication

The parties disagree over whether WD4-v3, Park, and Zhou qualify as prior art printed publications. The parties agree WD4-v3 represents an output document produced by the JCT-VC standards organization after a meeting (the sixth (Torino, July 2011) meeting), and Park and Zhou each represent an input document, discussed at a meeting (for Park and Zhou, the fifth (Geneva, March 2011) and seventh (Geneva, November 2011) JCT-VC meetings, respectively). Each of the relevant meetings took place in 2011, prior to the date of the invention.

i). Overview of Petitioner's Contentions

According to Petitioner, WD4-v3, titled "WD4: Working Draft 4 of High-Efficiency Video Coding" and designated JCTVC-F803 (version 3), represents a version of a working draft of the HEVC standard specification under development prior to September of 2011. *See* Pet. 3–4, 7–8, 25–26. Petitioner and Mr. Bross, a co-author of WD4-v3, state that the Joint Collaborative Team on Video Coding ("JCT-VC") was created in 2010 to develop a new generation HEVC standard (H.265) (to replace the then-

current standard (H.264)), and that, in pursuit of that goal, JCT-VC published WD4-v3, Park, and Zhou, among other documents. *See id.* at 18–19 (citing Ex. 1002 ¶ 184; Exs. 1020–1038). Mr. Bross (Ex. 1002) and Dr. Vetro (Ex. 1058) explain that the JCT-VC includes a team of video coding personnel from two parent organizations: Video Coding Experts Group ("VCEG") and Moving Picture Experts Group ("MPEG"). Ex. 1002 ¶ 184; Ex. 1058 ¶ 16; Pet. 18 (citing same).

The JCT-VC included "[v]ideo coding personnel from leading technology companies, universities, and research institutions" who "met quarterly for development of the new HEVC standard, starting in April 2010." Pet. 19 (citing Ex. 1002 ¶ 185; Ex. 1031, 1). In general, the JCT-VC considered a number of documents as part of the proposal process to develop the HEVC standards: "During these meetings, the JCT-VC considered proposals ('input' documents) submitted prior to the meeting and either during or after the meeting, 'output' documents were generated based on the proposals." *Id.* (citing Ex. 1002 ¶ 185; Exs. 1032–1038 (JCT-VC meeting reports)).

In other words, JCT-VC members from leading technology companies, universities, and research institutions met in a series of quarterly meetings starting in April 2010, to discuss input documents and previously produced output documents to implement the new HEVC standards, including discussing WD4-v3, Park, and Zhou, over three meetings from March through November of 2011 (depending on the document). *See* Pet. 19, 24–25; Ex. 1036 (meeting report for the fifth JCT-VC meeting); Ex. 1037 (meeting report for the sixth JCT-VC meeting); Ex. 1038 (meeting report for the seventh JCT-VC meeting); Exs. 1032–1035 (other JCT-VC

meeting reports). During and after the meetings, meeting organizers and members uploaded documents to two servers, the MPEG server and the JCT-VC server. *See* Pet. 23–25 (discussing upload dates for the documents).

In addition to Exhibits 1080–1083 and Exhibit 1087 discussed further below, Petitioner, Mr. Bross, and Dr. Vetro, state that additional evidence collectively shows the public accessibility of the documents to a person of ordinary skill or person interested in the art. *See* Pet. 23–25. This evidence includes, *inter alia*, the following: upload dates to the JCT-VC server of WD4-v3 (Sept. 8, 2011), Park (Mar. 19, 2011), and Zhou (Nov. 9, 2011), as verified by Exhibits 1041–1044, corroborated by evidence regarding uploading on the same dates to the MPEG server, as verified by Exhibits 1060–1063; an announcement in an email by Mr. Bross (with respect to WD4-v3); discussion of the input and output documents at the meetings; and the ability to locate documents by searching titles (with subject matter words) and authors on the JCT-VC server, without restriction. *See* Pet. 23–25 (citing Ex. 1002 ¶¶ 197–200; Ex. 1058 ¶¶ 21–30; Ex. 1021, 1–2 (General Policy for JCT-VC); Exs. 1041–1044 (upload dates); Ex. 1060–1063 (upload dates)).

Petitioner asserts that JCT-VC members uploaded the documents to the JCT-VC document management server, rendering all documents available to the public at large without restrictions (e.g., without requiring a username and password). *Id.* at 19–20 (quoting the JCT-VC's "general policy" as outlined in Ex. 1021, 2 ("In order to facilitate cross-organi[z]ational communication, all input and output documents of the JCT will be public (including the drafts of the coding specification, reference software, and conformance test data)."); citing Ex. 1002 ¶ 185; Ex. 1058

¶ 17). Over a year before the effective date of the invention, starting at the third meeting report, October 2010 (Ex. 1035), each meeting report announced the same JCT-VC server site (http://phenix.it-sudparis.eu/jct/)) to be "used for distribution of all documents." *See e.g.*, Ex. 1035, 2 (third meeting report announcing "[a] new document distribution site http://phenix.it-sudparis.eu/jct/"); Ex. 1032, 2, 7 (fourth meeting report, stating "the group transitioned" to the new website prior to the third meeting); Ex. 1036, 1 (fifth meeting report listing same website); Ex. 1037, 2 (sixth meeting report listing same website); Ex. 1038, 2 (seventh meeting report listing same website).

Petitioner contends that since at least 2011, the parent bodies of the JCT-VC (VCEG and MPEG) assigned an MPEG number to all JCT-VC documents and mirrored (uploaded) them onto the MPEG server, identified via the corresponding MPEG number. Pet. at 21–22. Petitioner cites documents evidencing identical upload times for each document at the two servers. *Id.* at 22; Ex. 1058 ¶ 20 (citing and comparing Exhibits 1041–43, 1060–63 showing upload times on the two sites). Although the MPEG server required a user to have a username and password, Petitioner, relying on the testimony of Dr. Vetro, explains "these credentials were regularly distributed to hundreds of MPEG members." Pet. 23 (citing Ex. 1058 ¶¶ 21–26). As indicated above, Petitioner notes that no such requirement existed for downloading from the JCT-VC server. *Id.* at 16–17.

Mr. Bross testifies

> based on my knowledge and recollection, given the prominence of the JCT-VC in the video coding industry, persons interested in tracking the developments of the latest video coding standard would regularly visit the JCT-VC site to ensure that products and

> services they were developing were consistent with the HEVC Standard under development.

Ex. 1002 ¶ 189; *see also* Pet. 20 (citing Ex. 1002 ¶ 189); Ex. 1078 ¶¶ 10–11 (similar testimony).

Dr. Vetro corroborates Mr. Bross's testimony regarding the MPEG as a parent body overseeing the JCT-VC and other aspects, including JCT-VC's general policy of making all documents on the JCT-VC website accessible. Ex. 1058 ¶¶ 15–20. As the head of the United States delegation for the MPEG parent body, Dr. Vetro personally distributed credentials to about 200 U.S. MPEG members, with Dr. Vetro's counterparts ("other Heads of Delegation") from other nations ("e.g., Korea, France") (Ex. 1058 ¶ 22) distributing similar credentials to their respective 550 national members. *See* Pet. 23 (citing Ex. 1058 ¶¶ 21–25; Exs. 1065–1072, 1075–1076). Dr. Vetro testifies to "hav[ing] personal knowledge that these credentials were regularly distributed to around 750 MPEG members worldwide in the 2011 timeframe, including in September 2011." Ex. 1058 ¶ 21. Similar to Mr. Bross's testimony, Dr. Vetro describes "the MPEG members at that time" as being "from renowned technology companies, universities, and research institutions." *Id.* ¶ 22; *see also id.* ¶ 24 & n.16 (citing Ex. 1075, 19–28 ("a copy of the Report of the 97th MPEG meeting held at Politecnico di Torino, in Torino, Italy on July 18-22" showing attendance by 492 MPEG members)).

Regarding accessibility, Dr. Vetro testifies as follows:

> Moreover, I am aware that once such credentials (e.g., passwords) were distributed to the MPEG members in the 2011 timeframe, *the documents on the MPEG site were widely available at least within the companies, universities, and research institutions* of the MPEG members *to other individuals*

> *(e.g., engineers) involved in video coding. I understand that at that time, such entities would distribute such documents so that individuals affiliated with such entities could keep up with the latest developments in the video coding standardization process(es), e.g., to ensure that products and services they were working on were compliant with the video coding standard(s).* Thus, I understand that the MPEG site and the documents stored thereon in the 2011 timeframe *were further accessible to thousands of individuals*.

Id. ¶ 23 (emphases added). Finally, Dr. Vetro testifies that each of the documents at issue in this proceeding (i.e., Exs. 1005–1007) were among those publicly available on the MPEG site before the effective filing date. *Id.* ¶¶ 27–29.

Petitioner provides evidence that Mr. Bross disseminated a link to WD4-v3 via email (Ex. 1057) to about 254 members of the JCT-VC community, when Mr. Bross announced completion of WD4-v3 to JCT-VC members via the e-mail to the JCT-VC reflector (an e-mail listserv) on September 12, 2011. Pet. 25 (citing Ex. 1002 ¶¶ 201–202 (Mr. Bross testifying about his announcement to the JCT-VC reflector of the availability of WD4-v3 to about 254 listserv recipients); Ex. 1037, 1–2, 180–81, 254–257 (sixth meeting report describing 254 meeting attendees and describing the listserv reflector as the meeting and group communication vehicle and providing a link to subscribe to list); Ex. 1057 (email)). Petitioner contends that, as of July 2011, at least 254 participants "subscribed to the reflector (an e-mail listserv)." *Id.* (citing Ex. 1037, 1, 6, 254–57; Ex. 1002 ¶ 201). Mr. Bross explains that about 254 members of JCT-VC received the announcement about the completion of WD4-v3 (Ex. 1002 ¶ 202) (with "d1" specifying version 3), because approximately 254 JCT-VC members attended the sixth (Torino) JCT-VC meeting in July 2011 (*id.* ¶ 201 (citing

Ex. 1037, 1, 6, 254–57)). Citing the sixth meeting report, Mr. Bross testifies "all communications between JCT-VC members were to be conducted using the reflector" to facilitate discussions by the JCT-VC Ad Hoc Groups on particular subject areas about the HEVC standard, and "any person [including interested individuals and member participants] could subscribe to the JCT-VC reflector." Ex. 1002 ¶ 201 (citing Ex. 1037, 2, 180–81).

At the relevant time frame in 2011, MPEG included about 750 MPEG members, and about 225–280 JCT-VC meeting participants attended the fourth, fifth, and sixth JCT-VC meetings at issue here (depending on the meeting), with the JCT-VC formed and operating under the auspices of well-known international bodies, including the United Nations (UN) and the International Organization for Standards (ISO) (Ex. 1025; Ex. 1026)) to create the new HEVC standards. *See* Ex. 1002 ¶¶ 183–189, 201, 202; Ex. 1058 ¶¶ 16–17, 21–25; Ex. 1025 (describing generic ISO standards); Ex. 1036, 2; Ex. 1037, 2; Ex. 1038, 2.

Similar to the JCT-VC meeting reports announcing the website for accessing documents, from the outset (i.e., beginning with the first meeting report, April 2010 (Ex. 1033)), each meeting report announced the same "reflector to be used for discussions by the JCT-VC" (jct-vc@lists.rwth-aachen.de), and announced the same link "[f]or subscription to this list, see http://mailman.rwth-aachen.de/mailman/listinfo/jct-vc," prominently on the first or second page of each report. Ex. 1033, 2 (first meeting report); Ex. 1034, 1–2 (second meeting report); Ex. 1035, 2 (third meeting report); Ex. 1032, 2 (fourth meeting report); Ex. 1036, 2 (fifth meeting report); Ex. 1037, 2 (sixth meeting report); Ex. 1038, 2 (seventh meeting report).

Petitioner also contends that since at least 2011, the JCT-VC server has been organized in a hierarchical manner categorized by JCT-VC meeting numbers. Pet. 20.[8] According to Petitioner, a person of ordinary skill and a person interested in the art could have performed appropriate automatic word searches, for example, by title and author, within a meeting page on the JCT-VC site to locate the documents. *Id.* (citing Ex. 1002 ¶¶ 190–193; Exs. 1041–1053).

Prior to the first meeting report, in January 2010, in the same document outlining the general policy of making documents public (i.e., "Terms of Reference of the Joint Collaborative Team on Video Coding Standard Development" (Ex. 1021)), the JCT-VC announced "[e]very contribution document to a meeting of the JCT should be registered in the document registry and *uploaded to the electronic archive several days in advance of the meeting, to ensure that it is available for review by other participants*." Ex. 1021, 2 (emphasis added). "Chairs will announce the precise deadline" for each meeting. *Id.* In addition, "[a]ll documents and contributions will be in electronic form." *Id.* Moreover,

> [f]or reasons of expediency, the JCT will maintain *a single document registry* and an electronic archive that are distinct from those of the parent bodies. The registry and archive will be linked to both the parent body web sites, and the parent bodies may ingest the JCT documents for their own reference and archival purposes.

[8] Mr. Bross similarly testifies in related IPR2018-00698 to search capability of the JCT-VC website to "at least 2011" and specifies search capability for an available document date as of March 2011. *See* IPR2018-00698, Ex. 1002 ¶ 186. In context, "at least 2011" means a date after 2010.

Id. (emphasis added). In the third meeting report, the JCT-VC specified the "new document distribution site" (i.e., the just-described single document registry) as http://phenix.it-sudparis.eu/jct/. Ex. 1035, 2 (also announcing "[t]he new site allows a more automated process of document registration and download").[9]

ii). Overview of Patent Owner's Contentions

Patent Owner provides the following "Overview [o]f JCT-VC," generally agreeing with Petitioner about the structure, organization, and meetings of the JCT-VC, for example, describing "input" documents "to be discussed during the meeting" and "draft" documents produced after meetings, including the three relevant meetings at issue here, the fifth (Geneva), sixth (Torino), and seventh (Geneva), each in 2011:

> In 2010, the Joint Collaborative Team on Video Coding ("JCT-VC") was created to develop a new generation High Efficiency Video Coding ("HEVC") standard (H.265) to replace the then current H.264 standard. Ex. 1002, ¶ 184.
>
> The JCT-VC includes a group of video coding personnel from two parent organizations: Video Coding Experts Group ("VCEG") and the Moving Picture Experts Group ("MPEG"). Ex. 1002, ¶184.
>
> JCT-VC members met quarterly for the development of the HEVC standard. Ex. 1002, ¶185.
>
> A JCT-VC meeting took place in Geneva on March 16–23, 2011 (the "Geneva meeting" or "5th Geneva meeting"). Ex. 1036, 1. JCT-VC members provided "input" documents to be discussed during the meeting. The number of input documents

[9] Prior to the third meeting, the JCT-VC used another site, according to the fourth meeting report: "Previously, JCT-VC documents had been made available at http://ftp3.itu.int/av-arch/jctvc-site, and documents for the first two JCT-VC meetings can be found there." Ex. 1032, 7.

> at the JCT-VC 5th Geneva meeting was approximately 500. Ex. 1038, 2.
>
> A JCT-VC meeting took place in Torino, IT on July 14-22, 2011 (the "Torino meeting"). Ex. 1037, 1. JCT-VC members provided "input" documents to be discussed during the meeting. The number of input documents at the JCT-VC Torino 2011 meeting was approximately 700. Ex. 1002, ¶185.
>
> A JCT-VC meeting took place in Geneva on November 21–30, 2011 (the "Geneva meeting" or "7th Geneva meeting"). Ex. 1038 at 1. JCT-VC members provided "input" documents to be discussed during the meeting. The number of input documents at the JCT-VC Geneva 2011 meeting was approximately 1000. *Id.* at 2.
>
> For a discussion of an input documents during the Torino and Geneva meetings, the presentation was limited to 5 minutes and 2 slides due to the "increasingly high workload for this meeting." Ex. 1036 at 5; Ex. 1037 at 5; Ex. 1038 at 5.
>
> For those input documents agreed upon, changes would be made into a working draft document sometime after the meeting. Ex. 1002, ¶ 185.

PO Resp. 6–7.

Patent Owner generally argues that Petitioner does not show that WD4-v3, Park, and Zhou produced by JCT-VC were publicly available prior to the date of the invention. *See* PO Resp. 2, 6–31. In particular, Patent Owner argues that one of ordinary skill exercising reasonable diligence would not have been able to find the documents in the JCT-VC repository. *Id.* at 9–19, 26–29. Patent Owner argues that even if search functionality on the JCT-VC site existed before the invention, interested artisans could only search individual meetings, not the JCT-VC site as a whole. *Id.* at 10–13, 18–19, 26–28. Additionally, Patent Owner argues that, with respect to the MPEG repository, the requirement of a password (which changed quarterly) and the confidential nature of the document repository weigh against public accessibility of a reference in that repository. *Id.* at 20–21, 29–30. Patent

Owner also argues that Dr. Vetro's testimony regarding the distribution of MPEG documents lacks support and is conclusory. *Id.* at 21–22, 31. Additionally, Patent Owner argues that Petitioner presents insufficient evidence to show that interested artisans would "innately know to visit the MPEG document repository," or that, if they did, that they would be able to find specific documents there. *Id.* at 20–21, 30. Patent Owner also argues that the email Mr. Bross references announcing the uploading of WD4-v3 and the other evidence presented by Petitioner fails to show the public accessibility of the document, and his testimony about the nature of the email listserv, and about others visiting the JCT-VC website, lacks factual support and credibility. *Id.* at 14–15, 23–25.

iii). Exhibits 1081–1083

Petitioner provides Exhibits 1081–1083 as Supplemental Information to show that interested artisans generally knew about different versions of documents from the JCT-VC as a prominent video coding standards body. In particular, Petitioner contends that interested artisans cited documents at the PTO in U.S. patent applications relating to different versions or variations of WD4 (all with the same JCT-VC document number JCTVC-F803). *See* Ex. 1081, 81–83, 356–579, 580–800; Ex. 1082, 73–82; Ex. 1083, 123–25, 127; Paper 16, 2–3 (Motion to Submit Supplemental Information); Reply 13–14; Paper 22 (granting Motion to Submit Supplemental Information).

Patent Owner does not dispute that the citations in the PTO patent applications refer to different versions of WD4 or WD4-v3. Rather, Patent Owner argues "Exhibits 1081–1083 are copies of file histories of applications. None were publicly available prior to December 13, 2011, the

critical filing date of the '1[6]3 patent. Furthermore, the inventors of the applications attended the July 2011 Torino JCT-VC meeting." PO Resp. 16 (citing Ex. 1037, 254, 256). This argument by Patent Owner implies interested artisans outside of the JCT-VC would not have been aware of the IDS filings prior to the date of the invention.

Notwithstanding Patent Owner's arguments, the file histories corroborate the JCT-VC policy of making JCT-VC documents public. Moreover, they corroborate Petitioner's showing that other interested members of the public should have been able to access documents from the meeting websites after exercising reasonable diligence, because contrary to Patent Owner's assertion, some of the listed inventors did not attend the meeting, as discussed below. Some inventors who attended the meeting, and some who did not, cited related video technology, including versions of WD4 prior to the date of the invention, in the cited patent applications.

In particular, for Exhibit 1081, Application Serial No. 13/273,191 filed at the PTO, the BIB DATA SHEET lists the following inventors: Kiran Misra, Sachin G. Deshpande, and Christopher A. Segall. Ex. 1081, 1. Page 254 of Exhibit 1037 lists one meeting participant, listed as number 186, as Andrew Segall (Sharp Corp.). Contrary to Patent Owner's argument, the two other inventors' names do not appear as meeting participants of the sixth Torino meeting at the cited meeting report pages. *See* PO Resp. 16 (citing Ex. 1037, 254, 256); *see* Ex. 1037, 254–57 (listing the sixth meeting attendees in alphabetical order).

Similarly, Exhibit 1082 lists Jie Zhao and Christopher A. Segall as inventors filing Application Serial No. 13/291891 at the PTO. Ex. 1082, 1. Contrary to Patent Owner's argument (PO Resp. 16), Jie Zhao does not

appear listed as a meeting participant of the sixth Torino meeting. *See* Ex. 1037, 257. Finally, Exhibit 1083 lists Robert A. Cohen as an inventor of Serial No. 13/281,334. Ex. 1083, 2. As Patent Owner argues (*see* PO Resp. 16), Robert Cohen appears listed as a meeting participant of the sixth Torino meeting. Ex. 1037, 254.

In summary, three of the inventors involved in filing U.S. patent applications (Exhibits 1081–1083) do not appear listed as meeting participants at the sixth JCT-VC meeting (which culminated in producing WD4-v3): Sachin G. Deshpande, Kiran Misra, and Jie Zhao. *See* Ex. 1037, 254–57. This evidence corroborates Petitioner's showing that interested artisans, in this case inventors filing patent applications at the PTO, with some of them not listed as meeting participants at the sixth (Torino) JCT-VC meeting, generally knew about documents available on the JCT-VC server during the sixth (Torino) meeting, specifically versions of WD4, and were able to obtain them, either via the inventors who attended the sixth meeting, or otherwise. As discussed above and further below, no restrictions on dissemination of any document existed under the auspices of the JCT-VC. *See* Exs. 1032–1038 (meeting reports); Ex. 1021, 2 (General policy of JCT-VC); Ex. 1002 ¶ 189; Ex. 1058 ¶ 17; Ex. 1032, 7 (communication practices); Ex. 1021, 2 (making all documents public on a single JCT-VC server prior to each meeting and as an archive as a general policy). That JCT-VC contributors or members listed JCT-VC documents on the IDS documents further shows the intent by the JCT-VC to make all the JCT-VC documents public.

iv). Exhibit 1087

Petitioner also provides "a copy of an article presented during an international video technology conference in November, 2011, which cites a version of the *Park* reference (JCTVC-E059)." Reply 14 (citing Ex. 1087, 4, 5, 26 (reference 6)). Patent Owner contends the article lacks a date (PO Sur-Reply 17), but as Petitioner contends (*id.*), it contains the date "November 2011" (Ex. 1087, 4), and it also includes a corroborating copyright date of 2011 along with ISSN numbers and a Library of Congress Control Number (*id.* at 3). The preface bearing the date "welcome[s] *readers* to the proceedings of the 5th Pacific-Rim Symposium on Video and Image Technology (PSIVT 2011), held in Gwangju, Korea, during November 20-23, 2011." *Id.* at 3 (emphasis added).

Patent Owner also contends "there is no evidence that the Park document referenced in Exhibit 1087 was the same Park document in this case" and "Exhibit 1087 was authored by members of the JCT-VC, therefore, there is no evidence that anyone outside of the JCT-VC had access to or could have obtained a copy of Park." PO Sur-Reply 17. As indicated above, Petitioner states Exhibit 1087 cites "a version of the *Park* reference." Reply 14. The Park document listed in Exhibit 1087 bears the same title and author as Park at issue here (Ex. 1006), and also the same meeting (fifth

JCT-VC Geneva 2011 meeting) and document number (JCTVC-E059).[10] So Exhibit 1087 at least provides a mechanism for interested members of the public to locate the version of Park at issue in this proceeding. *See* Reply 14.

Patent Owner argues, without evidence, that only members of the JCT-VC authored Exhibit 1087.[11] *See* PO Sur-Reply 17. Even if one of the Zou et al. authors of Exhibit 1087 also belonged to JCT-VC, the record shows that at least three of the Zou et al. authors did not attend the relevant fifth, sixth, and seventh JCT-VC meetings. *See supra* note 11. Exhibit 1087 demonstrates that the authors (Zou et al.) published "An Adaptive Motion Data Storage Reduction Method for Temporal Predictor" in November 2011 in a trade journal, "Lecture Notes in Computer Science," and also presented the article at "the 5th Pacific-Rim Symposium on Video and Image Technology . . . in Gwangju, Korea, during November 20–23, 2011" where

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[10] The citation to Park in Exhibit 1087 follows: "Park, S., Park, J., Jeon, B.: Modifications of Temporal MV Compression and Temporal MV Predictor. In: JCT-VC 5th Meeting, JCTVC-E059, Geneva (2011)." Ex. 1087, 26. This citation tracks the heading on Park (Ex. 1006, 1), which bears the same document number JCTVC-E059, as an input document at the 5th Meeting in Geneva (March, 2011), with the same title and authors. *Compare* Ex. 1087, 26, *with* Ex. 1006, 1. Nevertheless, Petitioner refers to Exhibit 1087 as a "version" of the Park reference.

[11] Exhibit 1087 lists the following authors: Ruobing Zou, Oscar C. Au, Lin Sun, Sijin Li, and Wei Dai. Exhibits 1038, 1037, and 1036, respectively list attendees at the seventh (Geneva), sixth (Torino), and fifth (Geneva) JCT-VC meetings, with the same or similar names to one author (Oscar Au), and list several persons named Li (but not Sijin Li), and they do not list the other three authors as attendees. Exhibit 1038, 302–05; Exhibit 1037, 254–57; Ex. 1036, 118, 208–211.

"[c]ommittee and all reviewers . . . provided timely and insightful reviews," and the authors "contributed their high-quality research work and shared their knowledge with our scientific community." Ex. 1087, 1–5. In addition to the above-noted version of Park, this Zou et al. article, reviewed and shared with the video coding scientific community, lists five other documents as reference material from the fifth (Geneva) JCT-VC meeting, and it lists other references presented at the fourth JCT-VC meeting, prior to the date of the invention. *Id.* at 26.

Similar to Exhibits 1081–1083, at a minimum, the Zou et al. article further shows the prominence of the JCT-VC and accessibility to JCT-VC documents in general to members of the interested video technology community by artisans other than JCT-VC members, and it shows an intent to make JCT-VC documents public to reach other interested members of the public. Also, Patent Owner does not allege that all the attendees at the November 2011 5th Pacific Rim Symposium in South Korea also attended the three relevant JCT-VC meetings or belonged to JCT-VC as members (or any other JCT-VC meetings). *Compare* Ex. 1087, 6–8 (listing committee members and chairs), *with* Ex. 1038, 302–05 (seventh Geneva meeting attendees); Exhibit 1037, 254–57 (sixth Torino meeting attendees); Ex. 1036, 118, 208–211 (fifth Geneva meeting attendees).[12]

[12] As an example, (randomly) choosing the first listed five members of the Technical Program Committee (Hezerul Abdul Karim, Toshiyuki Amano, Yasuo Ariki, Vishnu Monn Baskaran, Bedrich Benes) (Ex. 1087, 7), and comparing them with the attendee list for the fifth Geneva meeting (Ex. 1036, 208–211), the sixth Torino meeting (Ex. 1039, 254–57), and the seventh Geneva meeting (Ex. 1038, 302–03), reveals that none of these five members at the November 2011 5th Pacific Rim Symposium in South Korea attended the three relevant JCT-VC meetings.

v). Exhibit 1080

Petitioner submits Exhibit 1080 as Supplemental Information to corroborate the prominence of the JCT-VC and to show other interested artisans outside of JCT-VC would have known about the JCT-VC. *See* Paper 16, Paper 22. Exhibit 1080 evidences an IEEE "Special Section on the Joint Call for Proposals on High Efficiency Video Coding (HEVC) Standardization," published in an IEEE trade journal, IEEE TRANS. CIRC's and SYSTEMs for VIDEO TECH., V. 20, No. 12 (Dec. 2010), about a year prior to the effective date of the invention. Ex. 1080, 1–3. The IEEE "Special Section" describes how "the *premier video coding standardization organizations*, namely the ITU-T Video Coding Experts Group (VCEG) and the ISO/IEC Moving Picture Experts Group (MPEG), have been actively seeking emerging developments to identify when the next major step forward in compression capability would become feasible." *Id.* at 1–3 (emphasis added). It describes "an agreement . . . reached in January 2010 to establish a Joint Collaborative Team on Video Coding (JCT-VC) and to issue a joint Call for Proposals (CfP)." *Id.* (citing "Joint Call for Proposals on Video Compression Technology, ITU-T SG16 Q6 document VCEG-AM91 and ISO/IEC JTC1/SC29/WG11 document N11113, ITU-T SG16 Q6 and ISO/IEC JTC1/SC29/WG11, Kyoto, Japan, Jan. 2010.").

The "Special Section" initially describes the first "commercially successful digital video compression standard," which "emerged 20 years ago," and "resulted *in an explosion of products and services that created consumer video technology as we know it today*." *Id.* at 3 (emphasis added). It notes "*[e]ach international video coding standard* has been built on a foundation of knowledge from the preceding generation, and *has enabled an*

expanding array of product offerings and design improvements, as video support spread into a more diversified set of applications—particularly including Internet streaming and personal videotelephony, among others." *Id.* (emphases added).

The "Special Section" not only provided prominent notice as an IEEE publication to interested artisans about the JCT-VC and the promulgation of new standards with the "project name of the high efficiency coding (HEVC)" (*id.* at 5), it also described the first JCT-VC meeting held in Dresden in April 2010 (Ex. 1080, 3) and referenced the meeting report for the first meeting, JCT-VC200 (Ex. 1080, 5 (reference number 8)), which in turn, Petitioner filed as Exhibit 1033. The first meeting report (JCT-VC200, Exhibit 1033) describes the intent to standardize HEVC and also describes how to register for the email reflector (Ex. 1033, 2), consistent with the descriptions published (uploaded to the JCT-VC server) in the all the meeting reports prior to the date of the invention, including the second thru seventh meeting reports that Petitioner also filed as exhibits. Ex. 1033, 2 (first meeting report); Ex. 1034, 1–2 (second meeting report); Ex. 1035, 2 (third meeting report); Ex. 1032, 2 (fourth meeting report); Ex. 1036, 2 (fifth meeting report); Ex. 1037, 2 (sixth meeting report); Ex. 1038, 2 (seventh meeting report); *see also* PO Resp. 23 (citing Ex. 1038, 2 and discussing the reflector).

Besides the first meeting report (JCT-VC200), the "Special Section" article cites at least seven other JCT-VC documents that the JCT-VC published pursuant to the first meeting dealing with HEVC, namely, JCTVC-A114, JCTVC-A116, JCTVC-A119, JCTVC-A202, JCTVC-A203, JCTVC-A204, and JCTVC-A205. *Compare* Ex. 1080, 6 (references

numbered 7, 9–14), *with* Ex. 1033, 51–55 (listing and describing the reference documents at the first meeting). Even though the IEEE "Special Section" authors (Ex. 1080, 7–8) also attended the first JCT-VC meeting and contributed thereto (*see* Ex. 1033, 1, 56–57), the "Special Section" notified other interested artisans, in an "influential" IEEE journal, about the prominence of JCT-VC and of the existence of JCT-VC publications in December 2010 for creating HEVC standards by publishing the article and references in a prominent IEEE trade journal.[13] *See* Ex. 1078 ¶ 12 ("[T]his Journal was one of the most influential technical journals in the video coding field in the 2010-2011 timeframe (and even later)."). That the Special Section authors contributed to the JCT-VC further shows the intent to make all HEVC documents public.

Patent Owner responds that Exhibit 1080 "does not . . . suggest interested artisans regularly visit[ed] the JCT-VC." PO Resp. 15. This argument ignores that the "Special Section" article appears in an influential IEEE trade journal (which Patent Owner does not dispute), describes the first JCT-VC meeting, and describes the JCT-VC as a collaboration of "the premier video coding standardization organizations" to promulgate HEVC. Ex. 1080, 3. In other words, the argument does not undermine Petitioner's showing based on the prominence of the JCT-VC as cited in this influential

[13] Two of the Special Section authors, Gary J. Sullivan (Microsoft) and Jens-Rainer Ohm (RWTH Aachen), also authored the first meeting report and other meeting reports. They and other Special Section authors, such as Thomas Wiegand (Fraunhofer HHI / TU Berlin) and W.J. Han (Samsung Electronics), actively contributed to the JCT-VC, with WD4-v3 listing Mr. Ohm, Mr. Han, and Mr. Sullivan as a co-authors or contacts with Mr. Bross, *See* Ex. 1005, 1; Ex. 1033; 1, 56–57; Ex. 1034; 1; Ex. 1037, 1; Ex. 1080, 1, 6–8.

IEEE trade journal publication. *See* Reply 12–15 (listing and describing Exhibits supporting the proposition of JCT-VC prominence and as corroborating the testimony of Dr. Vetro and Mr. Bross).[14]

vi). JCT-VC Prominence, Accessibility, and Testimony by Mr. Bross, Dr. Vetro, and Dr. Kalva

Patent Owner argues that Mr. Bross relies on a "bald allegation of . . . regular visitation to the JCT-VC site by interested POSITAs due to the 'prominence' of the JCT-VC." PO Resp. 16 (generally referring to Mr. Bross's testimony about conversations at the JCT-VC meetings (Ex. 1078 ¶¶ 10–13; Ex. 1002 ¶ 189)). Patent Owner similarly contends "Mr. Bross's testimony concerning the purported actions of others *vis-a-vis* the JCT-VC website and the public accessibility of WD4-v3 is not entitled to any weight," because it "is based on speculation and inadmissible hearsay." *Id.* at 18 (*see infra* § II.D (addressing Patent Owner's Motion to Exclude Ex. 1078 ¶¶ 10–11)). Patent Owner similarly characterizes Dr. Vetro's testimony as conclusory and unsupported. *See* PO Resp. 22 (citing Ex. 2001, 22; Ex. 2002, 23).[15]

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[14] Petitioner also relies on Exhibits 1084–1086. Patent Owner argues Exhibit 1084 "does not provide the publication date" and challenges the availability of Exhibits 1085 and 1086. PO Resp. 16–17. We need not address Exhibits 1084–1086 or other cited exhibits further (and do not rely upon them), given the weight of evidence discussed herein.

[15] Relying on findings in the *Infobridge* FWDs, Patent Owner disputes the weight of certain testimony by Mr. Bross and Dr. Vetro, but only seeks to exclude two paragraphs of Mr. Bross's testimony in his Supplemental Declaration. *See infra* § II.D (Motion to Exclude). As indicated throughout, the record here differs from the *Infobridge* IPRs, leading this panel to a different conclusion about the weight to afford the testimony.

The disputed testimony relates to assertions by Dr. Vetro and Mr. Bross regarding the accessibility of documents by JCT-VC members and non-members. *See* Reply 12 (citing "Dr. Vetro's testimony that documents uploaded to the MPEG site were 'accessible to thousands of individuals' because 'companies, universities, and research institutions of the MPEG members . . . would distribute such documents so that individuals affiliated with such entities could keep up with the latest developments in the video coding standardization process(es)" (citing Ex. 1058 ¶ 23; PO Resp. 23)); Ex. 1002 ¶ 189 (similar testimony by Mr. Bross discussed further below); Ex. 1078 ¶¶ 10–13 (similar testimony by Mr. Bross discussed further below).

Contrary to Patent Owner's arguments, other evidence, besides the testimony of Mr. Bross and Dr. Vetro, discussed above and further below (including Exhibits 1080–1083 and 1087, and statements by Dr. Kalva), corroborates the prominence and public awareness of the JCT-VC, showing that interested members of the public exercising reasonable diligence reasonably should have been able to obtain JCT-VC documents "if they wanted to." *See GoPro*, 908 F.3d at 694 ("[W]e explained that '[a]ccessibility goes to the issue of whether interested members of the relevant public could obtain the information if they wanted to' and '[i]f accessibility is proved, there is no requirement to show that particular members of the public actually received the information.'" (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1569 (Fed. Cir. 1988)); *Infobridge*, 929 F.3d at 1374 ("The Board's decision to reject Samsung's evidence because it did not establish that enough interested and

ordinarily skilled artisans *actually obtained the WD4 reference* was therefore erroneous." (emphasis added)).[16]

As discussed above (*supra* § II.C.3.i), Mr. Bross testifies, *inter alia*, that the "JCT-VC includes a group of video coding personnel from two parent organizations (ITU-T Study Group 16 (VCEG) and ISO/IEC JTC 1/SC 29/WG 11 (MPEG)." Ex. 1002 ¶ 184 (internal footnotes omitted); *see* Ex. 1025, 1 (describing ISO, the International Organization for Standards, as "an independent, non-governmental international organization with a membership of 163 national standards bodies"); Ex. 1002 ¶ 184 n.31 (describing ISO (citing Ex. 1025, 3; 1026, 1)). In addition, as noted above, Mr. Bross testifies that JCT-VC fell under the auspices of the two parent groups, ITU-T (International Telecommunication Union Standardization Sector) Study Group 16 (VCEG) and ISO/IEC JTC 1/SC 29/WG 11 (MPEG)—i.e., ultimately under the auspices of the ISO and the UN—international groups to promulgate a *world-wide set of standards*. Ex. 1002 ¶ 184 nn.30–31. For example, the affiliated JCT 1 group "provides a standards development environment where video coding personnel come together to develop *worldwide ICT standards*." *Id.* ¶ 184 n.31 (citing Ex. 1027, 1) (emphasis added). Dr. Vetro acted "as the new Head of the U.S. delegation of MPEG." *See* Ex. 1058 ¶ 21; Ex. 1002 ¶ 184 n.30.

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[16] In addition to Exhibits 1080–1083 and 1087, as discussed in the Institution Decision, the '163 patent discusses H.264 and HEVC standards, showing that even the inventors of the '163 patent were aware of the JCT-VC body publishing the standards and also aware of publications about the standards (on or before the date of the invention). Inst. Dec. 26 (citing Ex. 1001, 4:30–38).

So the record shows that JCT–VC created international HVEC standards as a collaboration of the MPEG and VCEG parent groups under international auspices, including the UN and ISO. Mr. Bross and Dr. Vetro corroborate each other's testimony because they both testify, as leaders familiar with the process of promulgating the world-wide prominent HEVC standards, that no restrictions existed in disseminating documents based on the JCT-VC policy (Ex. 1021, 2). As discussed further below, the testimony and supporting evidence generally shows that given the prominence of the JCT-VC, interested artisans would have kept abreast of the latest HEVC standards, informing their respective institutions about HEVC documents and developments, including accessing them for product compliance. *See* Ex. 1002 ¶¶ 12–14, 186–189, 192; Ex. 1058 ¶¶ 5–17, 22, 23; Ex. 1078 ¶¶ 10–13 (citing Ex. 1080); Pet. 20 (citing Ex. 1002 ¶ 189); Reply 12–13, 18–19.

In supplemental briefing, to counter the testimony of Mr. Bross and Dr. Vetro, Patent Owner contends Dr. Kalva "testified that people in the industry did not regularly visit the JCT-VC website." PO IB Rep. Br. (citing Ex. 2025 ¶ 114).[17] Unlike the testimony of Mr. Bross and Dr. Vetro, however, no corroborating evidence exists for Dr. Kalva's testimony. Although Dr. Kalva testifies he "did not regularly visit the JCT-VC website" and he was "not aware of anyone I was working with at the time in the video coding industry who would do as Mr. Bross suggests," Dr. Kalva does not

[17] Exhibit 2025 here only contains 22 paragraphs. Exhibit 2025 ¶ 114 in related IPR2018-00698 contains paragraph 114, which repeats the testimony in Exhibit 2025 ¶ 22 here.

explain how he would have known about the absence of "regular[] visit[s]" by others. *See* Ex. 2025 ¶ 22.

Moreover, Dr. Kalva's deposition testimony indicates his interest in video coding did not involve the HEVC standards in 2011. *See* Ex. 1092, 117:22–119:7. Rather, he testifies he had a "different focus" and "probably was doing different things" and because of "time" constraints, was not involved in the video coding standards being developed by the JCT-VC. *Id.* at 115:17–116:9. In short, although Dr. Kalva states "I was actively working in the video coding field and interested in the developments of the latest video coding standard" at the time of the invention (Ex. 2025 ¶ 22), his deposition testimony clarifies he "probably was doing different things" than investigating the emerging HEVC standards (*see id.* at 115:17–116:9), so his testimony bears little weight on the issue at hand.[18]

Dr. Kalva's testimony also shows that he did not have the knowledge that Mr. Bross and Dr. Vetro possessed about JCT-VC policies and procedures. *See* Ex. 1092, 125: 2–7 ("I participated in MPEG activities. I never participated in -- at that time in joint JCT-VC and MPEG activities."). As noted above and below, the collective testimony of Mr. Bross and Dr. Vetro shows that based on their knowledge as leaders of MPEG and JCT-VC, interested artisans at least expressed interest in visiting the JCT-VC and MPEG websites. *See* Ex. 1002 ¶¶ 12–14, 186–189; Ex. 1058 ¶¶ 5–17, 22, 23; Ex. 1078 ¶¶ 10–13. Mr. Bross's testimony also specifically shows

[18] Similarly, the Kalva Declaration does not describe any work in HEVC, but it does describe work related to MPEG-4 (from 1997–99) and generally describes other video work and teaching in the field. *See* Ex. 2025 ¶¶ 12–13.

interested artisans made specific inquiries about the website, namely "inquiries . . . regarding when they could expect the next update to the Working Draft of the HEVC Standard to be uploaded to the JCT-VC site and circulated on the JCT-VC listserv." Ex. 1078 ¶ 11. This testimony regarding inquiries (as opposed to declaratory statements, *see infra* Section II.D), provides another factual foundation from which Mr. Bross, testifying as a lay witness, properly may base an inference about an intent by interested artisans to visit the website and ensure HEVC compliance. *See id.*

In addition, Dr. Kalva's testimony does not quantify what "not regularly visit" means. *See* Ex. 2025 ¶ 22. Mr. Bross also does not quantify what "regularly visit" means explicitly, but provides context: "[P]ersons interested in tracking the developments of the latest video coding standard would regularly visit the JCT-VC site *to ensure that products and services they were developing were consistent with the HEVC Standard under development*." Ex. 1002 ¶ 189 (emphasis added). With no interest in HEVC or HEVC product development, it makes sense that Dr. Kalva and others he worked with would "not regularly visit" the website. For this reason also, the testimony provides minimal weight and lacks probative value.

Dr. Kalva's testimony shows he co-authored documents with his advisor, Dr. Eleftheriadis, and his advisee, Mr. Van Leuven, who each attended JCT-VC meetings and contributed documents to JCT-VC, indicating they would or should have been aware of the process of filing and obtaining documents from JCT-VC. *See* Reply 7 (citing Ex. 1092, 138:16–140:21, 107:21–109:7); Ex. 1092, 132:10–25, 139:20–140:29. Patent Owner also argues that Petitioner's "argument that Dr. Kalva's former academic advisor (from 19 years ago) and a former student attended JCT-

VC meetings and submitted proposals misses the mark," because Petitioner "still has no evidence that interested POSITAs would have been motivated to search for or could have found WD4-v3 on the JCT-VC website (or the MPEG website)." PO Sur-Reply 4–5 (citing Reply 7). Contrary to this argument, Petitioner shows artisans would have been motivated to search for known world-wide emerging HEVC standards on a known website to keep abreast of the emerging standards, as discussed above and further below. *See* Ex. 1002 ¶¶ 186–189; Ex. 1058 ¶ 23; Ex. 1078 ¶¶ 10–13. According to an ISO publication, "International Standards **make things work**. They give world-class specifications for products, services and systems, to ensure quality, safety and efficiency. They are instrumental in facilitating **international trade**." Ex. 1025, 1; *see also* Ex. 1080, 3 (describing an explosion of products culminating from updating video standards).

Mr. Bross testifies to "chairing breakout groups within JCT-VC" and "represent[ing his] employer," to "propos[e] technical contributions to the HEVC standard" (Ex. 1002 ¶ 186), and also testifies "[b]ased on . . . knowledge" gained through his experience that "persons interested in tracking the developments of the latest video coding standard would regularly visit the JCT-VC site to ensure that products and services they were developing were consistent with the HEVC Standard under development" (*id.* ¶ 189). Similarly, Dr. Vetro distributed credentials to provide access to documents to world-wide MPEG members "from renowned technology companies, universities, and research institutions" so that "such entities could keep up with the latest developments in the video coding standardization process(es), e.g., to ensure that products and services they were working on were compliant with the video coding standard(s)."

Ex. 1058 ¶¶ 22–23.[19] As noted above, other documents of record (but not of record during the *Infobridge* IPRs), corroborate this testimony by showing artisans of ordinary skill, or other interested artisans, knew (or should have known) in general of various JCT-VC documents (including versions of Zhou, Park, and WD4) prior to the date of the invention. *See* Ex. 1080 (IEEE Journal article citing the first JCT-VC meeting report and describing JCT-VC's new HEVC project); Exs. 1081–1083 (USPTO patent application IDS filings); Ex. 1087 (symposium article referencing JCT-VC articles); Ex. 1021 (announcing a general JCT-VC policy with "a single document registry and an electronic archive that are distinct from the parent bodies" to implement the new standards beyond H.264); Ex. 1032 (announcing and specifying the JCT-VC website as existing prior to the third meeting).

Patent Owner also contends "on cross-examination, Mr. Bross could not recall any details regarding such conversations [about further dissemination and tracking of HEVC developments] and stated that they likely took place during a coffee break of a JCT-VC meeting." PO Sur-Reply 4 (citing Ex. 2026, 135:20–136:14). Undermining this argument about the alleged lack of "any details," Patent Owner asked for specific details (such as a name or dates involved in or surrounding the conversations) and asked about details that Mr. Bross provided in Mr.

[19] Even though Dr. Vetro's testimony relates to further distribution within companies after an MPEG member initially retrieves a document from the MPEG server, the testimony corroborates Mr. Bross's testimony that institution members would have further disseminated HEVC updates to others in the institution to ensure HEVC product development and compliance (i.e., regardless of the specific server source). *See* Ex. 1058 ¶ 23; Ex. 1078 ¶¶ 10–13; Ex. 1002 ¶ 189.

Bross's Supplemental Declaration, but Patent Owner discouraged Mr. Bross from providing any other specific details not specifically asked about. *See* Ex. 2026, 133:20–21 ("Okay. I didn't ask any of that stuff. So I'm going to repeat the question again."), 134:1–3 ("Please answer the actual question. Don't --I asked a very precise question. Just answer the question.").

In any event, Mr. Bross provided sufficient details in his Supplemental Declaration about conversations occurring about seven years prior, including, *inter alia*, a discussion with "the representative of Allegro DVT," "representatives from Qualcomm and Broadcom," to whom he spoke about the standards, and a discussion about "potential bugs" (Ex. 1078 ¶ 11) in connection with the HEVC standards, and this detail generally tracks his deposition testimony to the extent Patent Owner questioned him about it. *See e.g.*, Ex 2026, 133–136 (describing conversations with Broadcom and Allegro representatives or engineers as personal in nature). As an example, referring to the Allegro employee during his deposition, Mr. Bross states his "colleague at the time used to work with him" (Ex. 2026, 134:8–10) and "my colleague at that time . . . had a master of science degree . . . and he used to work in that company" (*id.* at 133:12–14). *See id.* at 132:16–18 ("So . . . that's why I can very specifically recall that -- having that inquiry and that conversation with the guy from Allegro DVT."). Mr. Bross describes other persuasive reasons why he recalls the conversations in his Supplemental Declaration. *See, e.g.*, Ex. 1078 ¶ 11 ("I recall that the inquiry from the representative of Allegro DVT included questions about potential bugs they found in at least one of the Working Drafts on the JCT-VC site, which showed me at that time the person's careful review of the then development of the working drafts.").

As further corroboration, Mr. Bross cites the "Special Section" article (Exhibit 1080) discussed above (§ II.C.3.v) as describing JCT-VC as the "premier video coding standardization organization," noting the predecessor standard to HEVC "resulted in an explosion of products and services that created consumer video technology as we know it today," and further noting "[e]ach international video coding standard has been built on a foundation of knowledge from the preceding generation, and has *enabled an expanding array of product offerings and design improvements.*" Ex. 1078 ¶ 12 (quoting Ex. 1080, 3 (emphasis added)). Exhibit 1025 further corroborates this testimony by showing "[i]nternational standards . . . . give world-class specifications for products, services and systems, to ensure quality, safety and efficiency. They are instrumental in facilitating international trade." Ex. 1025, 1 (emphasis omitted).

During his deposition, Mr. Bross also testified as follows about the meeting registration and further dissemination of information from a meeting:

> So everyone who registers picks up a badge and goes to the meeting, yes. . . . And also, the badge [does] not come with any restriction on confidentiality. So everyone picking up the badge can go to the meeting, listen to the discussion, come back to university, . . . to a company, [and] talk to the colleagues about what has been discussed at the meetings.

Ex. 2026, 137:18–25.[20]

[20] Mr. Bross refers to "persons that were not actively contributing to the JCT-VC but who monitored the development of the HEVC Standard via the JCT-VC website for potential impact on their respective company's future products." Ex. 1078 ¶ 11. In other words, some JCT-VC members contributed documents and attended specific work groups, but as a mere

Each meeting report lists hundreds of employee members and their affiliated world-wide organizations. *See* Ex. 1036, 208–211 (225 attendees); Ex. 1037, 254–257 (254 attendees); Ex. 1038, 302–05 (284 attendees). The record, therefore, supports the credible testimony of Dr. Vetro and Mr. Bross. Their testimony shows the expected result that interested artisans would have intended to keep their organizations abreast of what they sent their employees to do—promulgate and track world-wide standards (HEVC) for emerging video products for international trade. Unlike a thesis stored at a university library in Germany, *see In re Hall*, 781 F.2d 897, 897–900 (Fed. Cir. 1986), or a microfiche stored in a patent office in Australia, *see In re Wyer*, 655 F.2d 221, 226–27 (CCPA. 1981), the entire purpose of JCT-VC, which stored all its documents on a single server accessible to anyone, in order to promulgate HEVC standards under the auspices the UN and ISO, necessarily includes the underlying purpose of disseminating the information to facilitate world-wide trade. *See* Ex. 1025, 1 ("International Standards **make things work**. They give world-class specifications for products, services and systems, to ensure quality, safety and efficiency. They are instrumental in facilitating **international trade**. . . . International Standards impact everyone, everywhere.").

vii). The Email and JCT-VC Prominence

As noted above (§ II.C.3.i), Petitioner provides persuasive evidence that Mr. Bross disseminated a link to WD4-v3 via email (Ex. 1057) to about 254 members of the JCT-VC community announcing completion of WD4-

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attendee of a meeting, an interested artisan simply could track developments and ask questions during breaks, etc.

v3 via an e-mail reflector (an e-mail listserv) on September 12, 2011. Pet. 25 (citing Ex. 1002 ¶¶ 201–202 (Mr. Bross testifying about his announcement to the JCT-VC reflector of the availability of WD4-v3 to about 254 listserv recipients); Ex. 1037 (sixth meeting summary, describing 254 meeting participants and describing listserv reflector and link to subscribe to list); Ex. 1057 (email)). Petitioner contends as of July 2011, at least 254 participants "subscribed to the reflector (an e-mail listserv)." *Id.* (citing Ex. 1037, 1, 6, 254–57; Ex. 1002 ¶ 201). Mr. Bross testifies to a JCT-VC server upload date and public availability of September 8, 2011, for WD4-v3, prior to the Sept. 12, 2011, email announcing WD4-v3, each prior to the effective filing date of the invention. Ex. 1002 ¶¶ 197, 201; *see also* Ex. 1041 (showing upload date).

Patent Owner contends

> even if the email announcement of WD4-v3's availability on the JCT-VC website was received by 225 members of the JCT-VC, such evidence is insufficient to render WD4-v3 publicly accessible because WD4-v3 was not disseminated at the July 2011 Torino meeting, as it did not even exist until **after** the meeting.[21]

PO Resp. 24 (citing *GoPro*, 908 F.3d at 695 ("[T]he GoPro Catalog was disseminated with no restrictions and was intended to reach the general public.")).[22]

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[21] Patent Owner does not explain how it arrives at "225 members," as Mr. Bross testifies to about "254 members" attending the sixth (Torino) meeting and correspondingly receiving the email thereafter (although more members may have received the email). *See* Ex. 1002 ¶ 202.

[22] Patent Owner contends Petitioner "asserts for the first time in its Reply that Mr. Bross' e-mail reporting WD4-v3 was 'effectively a research aid and provided a sufficiently definite roadmap' for locating WD4-v3." PO Sur-

Similar to the GoPro catalog, the email with a link to WD4-v3 rendered WD4-v3 accessible on September 12, 2011 (Ex. 1057) to about 254 members possessing ordinary skill and interested in the subject matter, prior to the effective date of the invention, December 13, 2011, "with no restrictions and . . . intended to reach the general public," *see GoPro*, 908 F.3d at 695. *See supra* II.B.3.i (discussing the email); Ex. 1002 ¶¶ 201–202; Reply 4. In other words, like the GoPro catalog, the email contains no confidentiality restrictions to recipients about further dissemination. *See* Ex. 1057. Mr. Bross testifies that the email announcement provided further public accessibility. Ex. 1002 ¶ 202 ("Therefore, *WD4-v3* was accessible to anyone in the public at least as early as September 8, 2011, and subscribers to the JCT-VC reflector were further made aware of the availability of *WD4-v3* on the JCT-VC site at least as early as September 12, 2011."). So as a matter of routine email practice, without any restrictions in the email or anywhere else and with a general JCT-VC policy of public disclosure as discussed above (Exs. 1032–1038; Ex. 1021, 2), anyone on the listserv receiving the typical single-page email easily could have forwarded the email with WD4-v3 link to other interested artisans in order to keep their institutions abreast of the latest HEVC developments. *See* Ex. 1057; Ex. 1002 ¶¶ 189, 202; Ex. 1058

Reply 7 (quoting Reply 7). Contrary to this argument, Petitioner raised Mr. Bross's email announcement and reflector in its Petition. *See* Pet. 25–26 ("Therefore [based on the email], *WD4-v3* was accessible to anyone in the public at least as early as September 8, 2011, and subscribers to the JCT-VC reflector were further made aware of the availability of *WD4-v3* on the JCT-VC site at least as early as September 12, 2011."). Patent Owner filed the PO Sur-Reply to address the issue.

¶ 23; Ex. 1078 ¶¶ 10–13.

In other words, Petitioner persuasively shows that Mr. Bross's email announcement (Ex. 1057) provided a mechanism for interested artisans to have obtained WD4-v3 readily. *See* Reply 11 (citing Ex. 1057); Ex. 1002 ¶¶ 201–202. In particular, the email (Ex. 1057) provided a hyperlink of the "new version" of WD4-v3 to "participants and interested individuals of the JCT-VC" (Ex. 1002 ¶ 201) who, in turn, readily could have forwarded the standard email to their interested colleagues. *See* Ex. 1057; Ex. 1002 ¶ 202 ("I widely distributed *WD4-v3* to about 254 individuals via the JCT-VC reflector at least on September 12, 2011"). Petitioner persuasively shows that Mr. Bross disseminated a direct link to WD4-v3 to at least about 254 members of the JCT-VC, persons interested and ordinarily skilled in the relevant art, and any member of the public could have requested and received access to the JCT-VC reflector that announced and provided a link to WD4-v3 via email. Ex. 1002 ¶¶ 201–202; Ex. 1033, 1–2 (first meeting report uploaded June 9, 2010 describing the link and how to join the listserv reflector); Ex. 1036, 1–2 (fifth meeting report uploaded July 18, 2011 describing same); Ex. 1037, 1–2 (sixth meeting report uploaded November 17, 2011, describing same).

Regarding the listserv, Patent Owner argues "Mr. Bross does not provide any corroborating documentation demonstrating who actually applied, much less when they applied," so that "his factually unsupported and conclusory statements concerning the alleged number of people subscribed to the JCT-VC reflector *circa* 2011 are not credible." PO Resp. 23–24. Although Patent Owner disputes the specific number and types of artisans on the listserv, Patent Owner does not dispute some interested

artisans received the email. Tr. 75:18–19 (stating "certainly . . . there's a certain number of people" on the listserv, "obviously people on the working groups").

Mr. Bross provides corroboration by citing, *inter alia*, the Meeting Report of the Sixth meeting of the Joint Collaborative Team on Video Coding (JCT-VC), Torino, IT, 14–22 July 2011 (Ex. 1037). He testifies that at least 254 JCT-VC members attended the sixth JCT-VC meeting in Torino in July 2011 (i.e., prior to the date of invention), and he testifies that he distributed the email to at least 254 persons skilled in the art using the email reflector. Ex. 1002 ¶ 201 (citing Ex. 1037, 1, 2, 180–81). Further relying on the corroborating meeting report, he testifies "based on my knowledge and recollection, in at least 2011, all communications between members related to the development of the HEVC standard were to be conducted via the JCT-VC reflector (jct-vc@lists.rwth-aachen.de)." *Id.* (citing Ex. 1037, 2 ("The reflector to be used for discussions by the JCT-VC and all of its AHGs [Ad Hoc Groups] is the JCT-VC reflector: jct-vc@lists.rwth-aachen.de."), 180–81 ("The ad hoc groups established to progress work on particular subject areas until the next meeting are described in the table below [second entry of table includes Working Draft 4]. The discussion list for all of these ad hoc groups will be the main JCTVC reflector (jct-vc@lists.rwth-aachen.de).").

The sixth (Torino) meeting report that Mr. Bross cites states "[a]pproximately 254 people attended the JCT-VC meeting," thereby corroborating his testimony. Ex. 1037, 1. And the email further corroborates his testimony by providing the same reflector specified in Exhibit 1037, as the target: "**To:** jct-vc@lists.rwth-aachen.de"). Ex. 1057, 1.

The sixth (Torino) meeting report also describes "three particularly important output documents from the [sixth Torino] meeting," including "the HEVC specification Working Draft 4 (WD4)." Ex. 1037, 1. As discussed above, each of the meeting reports, beginning with the first meeting through the seventh, corroborate the testimony by announcing the existence of the same listserv reflector as the mechanism for communication at JCT-VC meetings and describing how to join it. *See* Ex. 1033, 2 (First meeting report: "The reflector to be used for discussions by the JCT-VC and all of its AHGs is the JCT-VC reflector: jct-vc@lists.rwth-aachen.de. For subscription to this list, see http://mailman.rwth-aachen.de/mailman/listinfo/jct-vc."); Exs. 1032, 1034–1038 (same reflector and subscription information). And as noted above (§ II.C.3.v), a prominent IEEE publication (Ex. 1080) announces the JCT-VC group as promulgating the new video HEVC standards, describes the first JCT-VC meeting, and cites the first meeting report (*id.* at 6 n.8) (Ex. 1033), which contains instructions for joining the reflector in April 2010 just like the subsequent meeting reports. Ex. 1033, 1–2; Ex. 1036, 1–2; Ex. 1037, 1–2; Ex. 1038, 1–2; PO Resp. 23 (citing Ex. 1038, 2 and discussing the reflector).

Given the importance of WD4-v3 and the prominence of JCT-VC in standardizing HEVC coding, interested persons receiving the email announcements readily had the means and adequate reason to forward the email to other interested persons, as indicated above. Other interested artisans would have been interested in joining the listserv based on the meeting reports and at least the announcement of the IEEE "Special Section" (Exhibit 1080) and other documents generally citing to JCT-VC as noted above (i.e., Exhibits 1081–83; Exhibit 1087). The link reasonably would

have led interested artisans and their employer institutions to WD4-v3 on the JCT-VC server.

Accordingly, Petitioner shows persuasively that interested members of the relevant public, including ordinary artisans within world-wide companies, universities, and research institutions, both members and non-members of JCT-VC (including MPEG parent members), would have been interested in, and should have been able to, join the listserv, and should have been able to access the international HEVC standards document WD4-v3, by either joining the listserv, receiving the email, or receiving a forwarded version of it. *See* Ex. 1002 ¶ 189; Ex. 1058 ¶¶ 19–20; Ex. 1078 ¶¶ 10–11; Ex. 1030; Ex. 1025; *supra* § II.C.3.v.–vi.

viii). Discussing Park and Zhou at JCT-VC Meetings

Petitioner also provides evidence that "*Park* and *Zhou* were presented and discussed during the fifth and seventh JCT-VC meetings, respectively, in March and November, 2011 (both in Geneva)." Reply 18 (citing Ex. 1078 ¶¶ 18, 20–21). Petitioner explains members discussed the documents "without any expectation of confidentiality regarding the discussions." *Id.* (citing Ex. 1078 ¶¶ 14–21). Petitioner provides corroborating "meeting reports for the fifth and the seventh JCT-VC meetings," which "include a summary of the discussion of *Park* and *Zhou* at that meeting." *Id.* (citing Ex. 1036, 118; Ex. 1038, 127). And "Mr. Bross personally recalled those discussions" about Park (Ex. 1078 ¶ 20) and Zhou (*id.* ¶ 21) at the two meetings, in his role as editor and chair. Reply 18 (citing Ex. 1078 ¶¶ 18, 20–21; Ex. 2026, 105:18–21, 109:18–22, 110:16–20, 113:15–18).

Patent Owner contends that "the only record evidence indicates that these documents were discussed for no more than 5 minutes during the meetings that took place over the course of 8–10 consecutive days and involved the discussion of 500 to 1,000 input documents." PO Sur-Reply 21 (citing Ex. 1036, 1, 6; Ex. 1038, 1, 5); *see also* PO IB Br. 2 (arguing "[t]he only record evidence indicates each 'presentation[] should not exceed 2 slides and 5 minutes.'" (citing Ex 1036, 6; Ex. 1038, 5)). Patent Owner contends "[t]hese fleeting discussions of Park and Zhou are simply not enough to show these documents were publicly accessible." PO Sur-Reply 21 (citing *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004)). Patent Owner also contends the meeting reports do not indicate, *inter alia*, "what topics were discussed, to what level of detail they were discussed, how many people participated in the discussions, the length of the discussions," and other related items. *Id.* at 20–21.

Nevertheless, Patent Owner concedes "Park and Zhou were among the hundreds of input documents considered for incorporation into the HEVC Standard under development." PO Resp. 3 n.5 (citing Ex. 2031; Ex. 2032; Ex. 1038, 2). No dispute exists over the fact that JCT-VC conferees discussed Park and Zhou during the relevant meetings. *See id.*

In addition, meeting records support Petitioner's position and show conferees discussed Park and Zhou at the fifth and seventh (Geneva) meetings for a sufficient amount of time to resolve specific technical issues associated with standards implicated by the documents. Regarding Park, the meeting notes for the fifth Geneva meeting discuss "suggested" changes: "It was suggested to investigate the other parts in CE work." Ex. 1036, 118. Also, with respect to Park, the meeting notes state "Tool 1 was similar to

JCTVC-E221, JCTVC-E147, JCTVC-E211, JCTVC-E307," and the members made the "Decision" to "Adopt Tool 1."[23] *Id.* Regarding Zhou, "[s]everal experts expressed support for" a proposal to "to discuss the need/trade-off of memory bandwidth reduction that may vary depending on the implementation," "provid[] a simplification on the temporal candidate position," and ultimately decide to "[a]dopt configuration 2." Ex. 1038, 127. Mr. Bross testifies that, as an active participant in HEVC and the JCT-VC, he participated in discussions regarding Park and Zhou. Ex. 1078 ¶¶ 20–21.

These decisions by the JCT-VC conferees regarding contributions and adoptions of proposals outlined in the Park and Zhou documents provide persuasive evidence that JCT-VC conferees discussed the documents in a sufficient manner to indicate accessibility to the documents prior to and during the meeting. The Park reference also generally corroborates Mr. Bross's testimony that JCT-VC members generally discussed documents involved in the standards at meetings, stating "[i]n the last meeting, temporal mv memory compression technique [1] was proposed and the results showed . . . buffer savings." Ex. 1006, 1.

The weight of evidence also suggests conferees accessed the documents in order to discuss them, and like all the JCT-VC meetings, no confidentiality restrictions existed at the relevant fifth and seventh meetings. *See* Ex. 1078 ¶¶ 20–21 (citing Ex. 1036, 118; Ex. 1038, 127); Ex. 1021, 1. Even if conferees did not actually access the documents during the discussions, evidence suggests that they necessarily must have been aware of

[23] As determined above (§ II.C.3.iv), in addition, Exhibit 1087 cites one version of Park and provides a roadmap to the Park document at issue here, including the meeting and document number.

the documents and their contents and accessed them at some point prior to the discussion to prepare for the discussion at the relevant meetings to reach intricate decisions about the documents. *See* Ex. 1078 ¶¶ 20–21 (citing Ex. 1036, 118; Ex. 1038, 127); Ex. 1021, 1. At the least, interested members of the relevant public should have been able to access these documents "if they wanted to." *See GoPro*, 908 F.3d at 694 ("[W]e explained that '[a]ccessibility goes to the issue of whether interested members of the relevant public could obtain the information if they wanted to' and '[i]f accessibility is proved, there is no requirement to show that particular members of the public actually received the information.'" (quoting *Constant*, 848 F.2d at 1569)). As discussed above (§ II.C.3.i), beginning in January 2010, the JCT-VC announced that meeting participants should upload all documents (from both parent bodies) to a single JCT server (linked to both parent bodies) with precise upload deadlines prior to the meetings. Ex. 1021, 1–2 ("Terms of Reference of the Joint Collaborative Team on Video Coding Standard Development": announcing "[e]very contribution document to a meeting of the JCT should be registered in the document registry and *uploaded to the electronic archive several days in advance of the meeting, to ensure that it is available for review by other participants*." (emphasis added)). The JCT-VC also noted "[c]hairs will announce the precise deadline" for uploading documents prior to each meeting. *Id.*

Then, after announcing the Terms of Reference of the JCT, starting in October 2010 in the third meeting report, the series of meeting reports each inform artisans and meeting participants that all documents were available on the JCT-VC server at the document distribution site http://phenix.it-

sudparis.eu/jct/. Ex. 1035, 1 (third meeting report: "A new document distribution site http://phenix.it-sudparis.eu/jct/ became operational shortly before the Guangzhou meeting and was exclusively used for distribution of all documents."); Ex. 1032, 2 (fourth meeting report, stating "the document distribution site http://phenix.it-sudparis.eu/jct/ was used for distribution of all documents"); Ex. 1036, 1 (fifth meeting report, same); Ex. 1037, 2 (sixth meeting reporting, same); Ex. 1038, 2 (seventh meeting report, same).

Evidence of record shows an intent and requirement to make all the documents available prior to each meeting on a known website available to the public without restriction, showing that interested members of the public inside and outside of the JCT-VC would have been aware of the emerging HEVC standards and should have been able to obtain documents related to the standards on the JCT-VC website. *See* Ex. 1002 ¶¶ 184, 188–189; Ex. 1078 ¶ 20; Ex. 1021, 2; Exs. 1080–1083; Ex. 1087; Ex. 1058 ¶¶ 10–13. With no restrictions on dissemination (Ex. 1021, 2 (i.e., "all input and output documents of the JCT will be public")), conferees would have been able to further disseminate the documents to non-JCT-VC interested persons in their respective institutions, in order to keep their institutions apprised of their efforts and the emerging HEVC standards, as the above-discussed testimony of Mr. Bross and Dr. Vetro indicates. Or any artisan interested in the emerging world-wide HEVC standard and reading the articles filed as Exhibits 1080 and 1087 and exercising reasonable diligence should have been able to contact the JCT-VC, a specific JCT-VC member, or an author, of the respective article to obtain JCT-VC references related to the latest of

developments in a particular subject area.[24]

ix). Searching by Key Words for Title and Author

Patent Owner argues Petitioner fails to present "any evidence" of search functionality in 2011. PO Resp. 13. Patent Owner also argues Petitioner "failed to present evidence sufficient to establish that an interested

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[24] Relying on *Samsung Elecs. Co., Ltd. v. Ibex PT Holdings Co., Ltd.*, Case IPR2018-00012, slip op. at 18 (PTAB Apr. 10, 2019) (Paper 30) ("*Ibex* FWD" in IPR2018-00012), Patent Owner also asserts that the Petition fails to present the argument that "Park and Zhou are printed publications because they were allegedly 'disseminated' because they were presented and discussed during the fifth and seventh JCT-VC meetings," so the allegedly new argument exceeds the proper scope of the Reply. PO Resp. 20. Contrary to Patent Owner's argument, unlike the cited *Ibex* IPR, the Petition and Motion to Submit Supplemental Information (which the panel granted (*see* Papers 16, 22)) fairly presents the issue, and Patent Owner filed the PO Sur-Reply to discuss the issue. The Petition generally asserts "WD4-v3, Park, [and] Zhou, . . . were developed by members of the JCTVC, which was created in 2010 to develop a new generation high efficiency video coding (HEVC) standard (H.265) to replace the then-current H.264 standard." Pet. 18. Describing regular JCT-VC meetings, the Petition states "[d]uring these meetings, the JCT-VC considered proposals ('input' documents) submitted prior to the meeting and either during or after the meeting, 'output' documents were generated based on the proposals." *Id.* at 19 (citing Exs. 1032–1038 (JCT-VC meeting reports)). As indicated herein, the cited meeting reports reveal discussions of the documents. So the Petition reasonably apprises Patent Owner of Petitioner's position regarding discussion of the documents (as does the Motion to Submit Supplemental Information), and the PO Sur-Reply provides the opportunity to respond. *See VirnetX v. The Mangrove Partners Masters Fund*, Nos. 2017-1368, -1383, slip op. at 1 (Fed. Cir. July 8, 2019) ("After VirnetX argued to the Board that Petitioners' reply raised new arguments, the Board authorized VirnetX to file a sur-reply to respond to the arguments that it contended were improperly raised," providing VirnetX with "an adequate notice and opportunity to respond.") (nonprecedential).

person of ordinary skill in the art would have been motivated to search for or could have found WD4-v3 in the JCT-VC document repository exercising reasonable diligence." *Id.* at 19 (citing *SRI Int'l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008)). According to Patent Owner, to locate WD4-v3, one of ordinary skill would need to take "unreasonable steps." *See id.* at 18–19 (listing alleged steps). This argument does not relate to Petitioner's showing regarding Mr. Bross's email, which provided a direct link to WD4-v3. Regarding Park and Zhou, Patent Owner argues an interested searcher first must select the correct fifth meeting to find Park and the correct seventh meeting to find Zhou, and then respectively pick one of 500 documents or one of 1,200 documents within the respective fifth or seventh meeting directory. *See* PO Resp. 28.

Patent Owner agrees with Petitioner that "Park and Zhou were among the hundreds of input documents considered for incorporation into the HEVC Standard under development." PO Resp. 3 n.5 (citing Ex. 2031, Ex. 2032, Ex. 1038, 2). As discussed above, citing the testimony of Mr. Bross and Dr. Vetro, Petitioner provides evidence that since at least 2011, the JCT-VC and the MPEG servers were organized in a hierarchical manner categorized by JCT-VC meeting numbers. Pet. 20–21 (citing Ex. 1002 ¶¶ 190–193; Ex. 1058, ¶¶18–19; Exs. 1041–1053).[25] According to Petitioner and Mr. Bross, in 2011, a person of ordinary skill and interested in

[25] Petitioner cites persuasive evidence showing the MPEG and JCT-VC servers included the same structure. *See supra* § II.C.3.i. As indicated above (*supra* II.B.3.i) members of both parent bodies of JCT-VC, including MPEG, and nonmembers, should have known about the JCT-VC server as announced at the outset to be "a single document registry . . . distinct from those of the parent bodies." Ex. 1021, 2.

the art could have performed appropriate searches, by keywords of the title and author, within a meeting page on the JCT-VC site to locate the documents. *Id.* (citing Ex. 1002 ¶¶ 190–193; Exs. 1041–1053). As an example, Mr. Bross testifies "the JCT-VC site had search capability in September 2011" so that persons skilled in the art could search by "using common terms" such as "'High Efficiency Video Coding'/'High-Efficiency Video Coding' or variants thereof within the meeting page to locate a working draft document." Ex. 1002 ¶ 192. Mr. Bross also testifies about search capabilities "in the 2011 timeframe" (including September 2011). *Id.* Mr. Bross also testifies he "recall[s] and us[ed] this search functionality" during "March–December 2011." Ex. 1078 ¶ 8.[26] Regarding motivation for searching HEVC documents, as determined above (§ II.C.3.vii–viii), Petitioner provides persuasive evidence and argument that persons interested in video technology would have sought to keep abreast of the latest HEVC standards. *See, e.g.*, Ex. 1025 (describing the relationship between ISO standards and world trade); Ex. 1080 (describing a similar relationship); Ex. 1002 ¶ 189; Ex. 1058 ¶ 23; Ex. 1078 ¶¶ 10–13.

For WD4-v3, titled "WD4: Working Draft 4 of High-Efficiency Video Coding" (Ex. 1005), an artisan interested in the latest video coding prior to the date of the invention in late 2011, could have entered a search term such

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[26] The Federal Circuit's *Infobridge* decision states that the petitioner there did not present evidence of search capability to the Board. *See Infobridge*, 929 F.3d at 1371 ("Samsung presented 'no evidence that one could search for or locate [the] WD4 [reference] based on its subject matter.'" (quoting the Board's *Infobridge* FWD, 2018 WL 1940480 at *7)); *accord id.* at 1373 ("[T]he Board . . . noted that the structure of the website, which organized content by meeting and lacked a way to search by subject matter, meant that a person would only find the WD4 reference if they knew where to look.").

as "video coding" after navigating to one of the latest meetings before the date of the invention, including the most recent meeting in Torino, to find that document. Mr. Bross credibly testifies "Exhibit 1055 shows search results for the term 'high-efficiency video coding' in the document register for the Torino meeting," and "[a]s shown, only one document resulted from that search, again the one document being Working Draft 4 (including version 3 of Working Draft 4)." Ex. 1002 ¶ 193.

Similarly, for the Park document, titled "Modifications of Temporal MV Memory Compression and Temporal MV Predictor" (Ex. 1006), a searcher looking for the latest temporal memory compression and temporal predictor techniques prior to the date of the invention, should have been able to enter normal or routine search terms such as "memory compression" and "temporal" and "MV" after navigating to the most recent meeting (i.e., after that meeting) prior to the date of the invention, namely after the fifth JCT-VC (Geneva) meeting, to find that document. *See id.* And similarly, for the Zhou document, titled "Non-CE9: Modified H Position for Memory Bandwidth Reduction in TMVP Derivation" (Ex. 1007), a searcher looking for the latest memory reduction techniques in video processing prior to the date of the invention, should have been able to enter routine and well-known search terms such as "memory" or "bandwidth" after navigating to the most recent meeting (i.e., sometime after the seventh (Geneva) meeting), to find that document. *See id.*; Reply 10–11 (arguing "an artisan interested in video coding can be expected to spend the minimal time to visit the JCT-VC website and perform simple title searches in the Geneva or Torino meeting document register to locate the then most current working draft available or the technical topic covered by Park or Zhou, and even to scroll through the

various Geneva or Torino documents to locate these documents" (citing Ex. 1002 ¶¶ 192–193; Ex. 1078 ¶¶ 4–9)).

Quoting the recent *Ibex* FWD in IPR2018-00012 (*supra* note 24), Patent Owner replies that Petitioner failed to provide "evidence or argument that [] the . . . search terms from the title of [Park or Zhou] are meaningful search terms" or "***why*** a[n] [interested POSITA] would search the documents of the [fifth or seventh] JCTVC meeting using any terms from [Park or Zhou's] title." PO Sur-Reply 16 (quoting IPR2018-00012, *Ibex* FWD, slip op. at 18). But in the particular *Ibex* FWD that Patent Owner relies upon, the document at issue, Zhou II, lacked any meaningful search terms, unlike here. *See* IPR2018-00012, *Ibex* FWD, slip op. at 17 (("Nor has Petitioner provided any argument of evidence as to why a person interested and skilled in the art would search the documents of the sixth JCT-VC meeting using any terms from Zhou II's title "Evaluation results on A.09, A.13–16 and an alternative solution.").

In other words, in the *Ibex* FWD in IPR2018-00012, only terms like "evaluation," "alternative," "results," and "A.09" appear in the title of Zhou II, i.e., either generic terms or a lexicographic term like A.09; in either case, terms likely known only to the authors. Here, on the other hand, an interested person readily should have been able to start by entering well-known terms in the art of video compression techniques such as "memory compression," "temporal," "reduction," or "bandwidth" to arrive at the descriptive titles in the Zhou and Park documents.

Furthermore, Petitioner provides reasonable motivation for why interested persons would have searched for documents related to the latest HEVC standards—e.g., so that they could have developed and sold products

on the market complying with the latest video coding standards or at the least gain knowledge about the standards. *See* Ex. 1002 ¶ 189; Ex. 1058 ¶¶ 19–20; Ex. 1078 ¶¶ 10–13; Ex. 1080, 3; Ex. 1025, 1.

Contrary to Patent Owner's arguments about the mechanics of searching (*see* PO Sur-Reply 15), a searcher navigating the website to the *most recent* meeting (i.e., sometime after the meeting but before the effective filing date of the invention) would not have had to navigate through all the meetings to the correct meeting site in a random fashion, rather a reasonable searcher at the relevant time only would have needed to select the most recent meeting to obtain the most recent documents (or if required work backwards in time from there to the fifth meeting with respect to Park, depending on the time frame). *See* Reply 9 (arguing "it would have been reasonable for a skilled artisan interested in the latest Working Draft (or the input documents considered in its preparation) to have consulted the folder for the most recent meeting—those in Geneva or Torino" (citing Ex. 1002, ¶¶ 192–193; Ex. 1078 ¶¶ 4–7; Ex. 1079)).

Such navigation and title searching would have been easier than traveling to a remote library in Germany or patent office in Australia and searching there, as Petitioner persuasively argues:

> If reasonable diligence would require a person of ordinary skill in the art to travel to a German library and search a paper library catalog, *In re Hall*, 781 F.2d 897, 897–900 (Fed. Cir. 1986), or travel to Australia to search the microfiche in its patent office, *In re Wyer*, 655 F.2d 221, 226–27 (CCPA 1981), an artisan interested in video coding can be expected to spend the minimal time to visit the JCT-VC website and perform simple title searches in the Geneva or Torino meeting document register to locate the then most current working draft available or the technical topic covered by *Park* or *Zhou*, and even to scroll

> through the various Geneva or Torino documents to locate these documents. (Ex. 1002, ¶¶192–193; Ex. 1078, ¶¶4–9.)

Reply 10. Nothing in *Wyer* or *Hall* indicates a hypothetical searcher knew the specific document would be at the German library or the Australian patent office. *See Wyer*, 665 F.2d at 226–27 (finding accessibility under factors including intent to make public, number of copies, and other factual inquiries as classification and indexing); *Hall*, 781 F.2d at 899 (similar inquiries relying on a general library procedure as to indexing, cataloging, and shelving of theses to find accessibility).

By analogy, like the classification in *Hall* and *Wyer* with no publication of a specific document, the JCT-VC server itself involves a meaningful classification and an intent to make public, because interested artisans outside of the JCT-VC would have known at least that the server contains a class of HEVC documents, making it a narrower target than an entire library or patent office (in another country), which involve multiple classifications.[27] *See, e.g.*, Ex. 1021, 2 (announcing "a single document registry and an electronic archive"); Ex. 1080 (describing JCT-VC in an IEEE publication and citing the first meeting report); Ex. 1087 (citing a version to Park and other JCT-VC documents). In addition, the search of the FTP server involved in *SRI Int'l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1196 (Fed. Cir. 2008), involved a much more involved and nuanced searching scheme than a simple navigation to a meeting cite followed by a "customary" word search of a title (or author). *See id.* at 1196 ("[T]he FTP

[27] The JCT-VC server also includes categorization by different meetings (in different cities), like different libraries in different cities, albeit with a mouse-click for traveling.

server did not contain an index or catalogue or other tools for *customary and meaningful research.* Neither the directory structure nor the README file in the PUB subdirectory identifies the location of papers or explains the mnemonic structure for files in the EMERALD subdirectory, or any subdirectory for that matter. In fact, the EMERALD subdirectory does not contain a README file. . . . [D]espite his knowledge of the field, FTP servers, and the paper, Dr. Bishop apparently would not have found the reference without Mr. Porras's precise directions." (emphasis added)).

Prior to the Oral Hearing and the Federal Circuit's *Infobridge* decision, in a series of emails and Orders, the panel granted permission for the parties to discuss the impact of the *Ibex* FWDs during the Oral Hearing *See* Ex. 2035 (allowing argument to address *Ibex* FWDs in IPR2018-00092, -00093, -00094 & -00095 per Patent Owner's request); Paper 31 (allowing argument to address the *Ibex* FWD in IPR2018-00012); Ex. 3002 (Petitioner seeking permission to file briefing regarding the Ibex FWD in IPR2018-00012); Paper 37, 3 (granting parties permission to "raise new arguments . . . addressing recent cases" during the Oral Hearing). During the Oral Hearing, Petitioner compared a relevant *Ibex* decision in IPR2018-00012 involving Zhou II as described above, arguing "the title of that specific input document may not have been descriptive." Tr. 28:21–28. In contrast, Petitioner mentioned search terms related to titles at issue in this proceeding (and the related '697 and '698 proceeding), such as "memory," "compression," and "memory compression," generally pointing to terms for artisans interested in the "video compression field" or "high efficiency video coding standards." *See id.* at 26:14–29.

At the Oral Hearing, the panel asked Patent Owner, "[l]et's take someone who's interested . . . in 'scanning,' . . . wouldn't it make sense to just put the word 'scan' in?" *Id.* at 64:14–16. The panel pointed out that in the *Ibex* FWD in IPR2018-00012, the title of the document at issue, Zhou II, "Evaluation Results on A09, A13 to A16, and an alternative solution," "wasn't very descriptive at all," but here, we appear to have a "different" title issue with respect to searching a title. *See id.* at 65:13–17; *see also id.* at 64:24–65:4 ("People do it with Google every day . . . . [T]he principle's the same. You look for a word that you think might be relevant, it seems.").

Patent Owner responded that Petitioner "clearly knew this was a critical issue, did not proffer any evidence to say that . . . Park[] or Zhou could be identified by title." *Id.* at 56:23–24. Patent Owner explained

> if . . . you could have used the word "scan," Samsung clearly would have said so. They said it with respect to the working draft, and I think the Board can take comfort in that fact, that [Petitioner] clearly knew this was a critical issue, did not proffer any evidence to say that . . . Park[] or Zhou could be identified by title.

Id. at 57:18–24.

Patent Owner does not dispute Petitioner's general position that an interested artisan searching for a title should have been able to find a descriptive title using a descriptive word in that title. *See* Pet. 20–21 (discussing, *inter alia* "search fields including title and author" and contending "[b]y navigating to any meeting, a user (including a person interested and ordinarily skilled in the art) could view the documents related to the meeting and download a document based on the information regarding the document such as the title and the source"). Patent Owner only argues Petitioner did not provide evidence about *specific* descriptive words used in

the search field for the titles of WD4-v3, Park, and Zhou. *See* Tr. 57:18–24; PO Sur-Reply 16. But this argument does not address the thrust of Petitioner's showing, namely, an interested artisan exercising reasonable diligence should have been able to use a descriptive word in a descriptive title to find a particular document after going to the most recent meeting site.

In re Lister, 583 F.3d 1307 (Fed. Cir. 2009), informs us that searching a title (or indexing by title), where the title bears a significant relationship to the subject matter, should be sufficient under appropriate circumstances. *Lister* states "the Lister manuscript *was publicly accessible* as of the date that it was included in either Westlaw or Dialog, *the databases that permitted keyword searching of titles*." *Lister*, 583 F.3d at 1316 (emphases added). Distinguishing cases, *Lister* reasons

> [i]n contrast [to *Hall*], the thesis at issue in *In re Bayer* was held not to have been publicly accessible as of the critical date because at that time it was uncatalogued, unshelved, and could have been found in the library at the University of Toledo "only by one having been informed of its existence by the [author's] faculty committee, and not by means of the customary research aids available in the library."

Lister, 583 F.3d at 1312 (quoting *In re Bayer*, 568 F.2d 1357, 1361 (CCPA 1978)).

Jazz, decided after the *Infobridge* IPRs, cautions against strict adherence to easily searchable websites as a single factor. *Jazz*, 895 F.3d at 1359 ("We have consistently held that indexing or searchability is unnecessary for a reference to be a printed publication under § 102(b)."); *see also Suffolk Techs. LLC v. AOL Inc.*, 752 F.3d 1358, 1365 (Fed. Cir. 2014) (stating "a printed publication need not be easily searchable after publication if it was sufficiently disseminated at the time of its publication" and

analogizing the relatively unknown difficult-to-search FTP server involved in *SRI*, 511 F.3d at 1197 as akin to "placing posters at an unpublicized conference with no attendees" (quoting *SRI*)); PO Resp. 18–19 (describing search functionality). In *Jazz*, "considering the multiple factors discussed above favoring public accessibility," including a finding that an artisan of ordinary skill likely "was interested in drug distribution, safety, and abuse," and "would have had reason to look to the Federal Register and FDA Advisory Committee meeting notices," the court deemed a sufficient indexing factor to be that "the Federal Register *was indexed with a table of contents organizing notices by agency*." *Jazz*, 895 F.3d at 1359 (quoting the Board's findings (emphasis added)). Here, the JCT-VC website provides a searchable title field after a user reaches a particular meeting site (only seven meetings occurred prior to the date of the invention). *See* Ex. 1002 ¶ 185 & n.32; Ex. 1037; Ex. 1038. On balance, Petitioner shows a reasonable searcher interested in the latest HEVC documents should have been able to enter a search term at the most recent JCT-VC meeting site or previous meeting sites to find Park, Zhou, and WD4-v3 based on their respective titles.

x). Summary Analysis

Citing a case subsequent to the *Infobridge* FWDs, namely *Medtronic, Inc. v. Barry*, 891 F.3d at 1382–83, *GoPro* states "our case law directs us to also consider the nature of the conference or meeting; whether there are restrictions on public disclosure of the information; expectations of confidentiality; and expectations of sharing the information." *Go Pro*, 908 F.3d at 694 (citing *Medtronic*, 891 F.3d at 1382); *accord Jazz*, 895 F.3d at 1358 ("[The relevant] materials were distributed via public domain sources

with no possible expectation that the materials would remain confidential or not be copied. We have consistently emphasized the importance of such expectations in determining whether a reference is publicly accessible."); *Cordis Corp. v. Boston Scientific Corp.*, 561 F.3d 1319, 1333–34 (Fed. Cir. 2009); *In re Klopfenstein*, 380 F.3d at 1351; *Mass. Inst. of Tech. v. AB Fortia*, 774 F.2d 1104, 1108–09 (Fed. Cir. 1985)).

For the reasons stated above, Petitioner shows that the JCT-VC's policy included making all materials on the JCT-VC website publicly available without any restrictions, with the "nature" of the JCT-VC meetings open, with no "restrictions on public disclosure," with no "expectations of confidentiality," and with "expectations of sharing the information," *see Go Pro*, 908 F.3d at 694, so that the world market of video products could reap the benefits of the new HEVC standards, tipping the balance toward a finding of public accessibility. The following additional evidence also all supports the finding of public accessibility: filing meeting reports for all relevant meetings listing the JCT-VC website and reflector policy; discussing documents including WD4-v3 (at least the non-final version thereof prior to its output), Park, and Zhou during meetings; requiring documents to be uploaded prior to meetings; sending an email link to WD4-v3 without restriction as to forwarding the email; writing an article in an influential IEEE journal to announce the JCT-VC's new HEVC project (Ex. 1080); and further publicizing the JCT-VC by citing documents thereto (Ex. 1087). By citing documents to the JCT-VC (Exs. 1081–83) in the PTO, even with the documents not published before the date of the invention, this still exhibits an intent to make JCT-VC documents public.

The entire purpose of the JCT-VC, a standards organization under the auspices of the UN and ISO, was to promulgate new HEVC standards and update the previous standards, making documents about the standards public, with updated video standards fostering world-wide trade. *See, e.g.*, Ex. 1021, 1; Ex. 1025, 1; Ex. 1080, 3; Ex. 1002 ¶ 189; Ex. 1058 ¶ 23; Ex. 1078 ¶¶ 10–13). The intent to make all JCT-VC/HEVC documents public distinguishes this case from cases cited by *Infobridge* as instructive on that record, namely a thesis case, *Bayer*, 568 F.2d at 1357 (concluding that "[a]ccessibility to appellant's thesis by the three members of the graduate committee under the circumstances of the present case" did not demonstrate that the work was publicly accessible), and *SRI*, 511 F.3d at 1196 (noting the similarity between "only one non-SRI person" having access to a reference and "the knowledge of the thesis's availability by the three professors in *Bayer*"). *See Infobridge*, 929 F.3d 1371–72 (discussing *SRI* and *Bayer* as instructive to the issue of accessibility).

Contrary to the situation here where an intent to make all the JCT-VC documents public existed, no reason existed for members of the thesis committee in *Bayer* or the review committee in *SRI* to make the relevant documents public or even mention them outside of the respective committees. For example, in *Bayer*, "appellant's thesis could have been located in the university library only by one having been informed of its existence by the faculty committee"—i.e., implying a lack of intent to publicize the existence of the thesis by the faculty committee. *See Bayer*, 511 F.3d at 1361. In *SRI*, "the prepublication Live Traffic paper, though on the FTP server, was not catalogued or indexed in a meaningful way and *not*

intended for dissemination to the public," and "the peer-review feature also suggests *no intent to publicize*." *SRI*, 511 F.3d at 1197 (emphases added).

On the other hand, as the court in *SRI* noted, "[i]n *Klopfenstein*, two professional conferences displayed posters. These posters were printed publications *because their entire purpose was public communication of the relevant information*." *SRI*, 511 F.3d at 1196 (citing *Klopfenstein*, 380 F.3d at 1347–50) (emphasis added); *see also Wyer*, 665 F.2d at 227 ("While intent to make public, activity in disseminating information, production of a certain number of copies, and production by a method allowing production of a large number of copies may aid in determining whether an item may be termed a 'printed publication,' they are neither always conclusive nor requisite.").

Here, the JCT-VC server served as a repository of the category of HEVC documents. Ex. 1021, 2 (specifying listing "a single document registry and an electronic archive," "all documents and contributions will be in electronic form," and "all input and output documents of the JCT will be public"). Also, as Mr. Bross notes, Exhibit 1080 represents "one of the most influential technical journals in the video coding field in the 2010–2011 timeframe (and even later)" and the IEEE published a "Special Section on the Joint Call for Proposals on High Efficiency Video Coding (HEVC) Standardization." Ex. 1078 ¶ 12 (quoting title, Ex. 1080, 3). The authors, JCT-VC contributors, cited the first meeting report, showing the intent to make documents public, as announced by the general policy. *See* Ex. 1021, 2. As noted above, this Special Section, in a prominent trade journal, specifically discussed how video standards result in an explosion of products, introduced the premier video organizations collaborating to form

JCT-VC, discussed the JCT-VC first meeting, its purpose (to publish new HEVC standards), and cited the first meeting report (Ex. 1033), which in turn describes the reflector "to be used for discussions by the JCT-VC" (*id.* at 2), and describes how to subscribe to it. Exhibit 1080, like Exhibit 1025 (ISO standards foster world-wide products), further shows that the JCT-VC involved a standards group that sought to reach the public to standardize commercial products.

In *Infobridge*, the court stated "[w]e are reluctant to assume that an email among potential collaborators should be treated the same as a public disclosure without clear findings by the Board." *Infobridge*, 929 F.3d at 1375. Here, as indicated above, Mr. Bross and the JCT-VC placed no restriction on further dissemination of the email or any documents at issue here, any interested member of the public could have jointed the listserv, and any interested member of the public would have had access to, and been able to find, WD4-v3, Park, and Zhou, after exercising reasonable diligence. Mr. Bross's email announced the availability of WD4-v3, so that interested artisans subscribing to the email would have been able to notify their respective institutions and colleagues about this important HEVC standards development simply by forwarding the email. *See* Ex. 1021, 1; Ex. 1025, 1; Ex. 1080, 3; Ex. 1002 ¶ 189; Ex. 1058 ¶ 23; Ex. 1078 ¶¶ 10–13; Ex. 1037, 1 ("The JCT-VC produced three particularly important output documents from the meeting," including "the HEVC specification Working Draft 4 (WD4)."); *see also Infobridge*, 929 F.3d at 1374–75 ("Rather than requiring Samsung to prove that persons of ordinary skill actually received the listserv email, the Board should have considered whether Samsung's evidence established that an ordinarily skilled artisan could have accessed the WD4

reference, after exercising reasonable diligence, based on the listserv email. This might include examining whether a person of ordinary skill, exercising reasonable diligence, would have joined the listserv. *See, e.g.*, *GoPro*, 908 F.3d at 694. It also might include considering the circumstances of the email itself, for example why the email was sent and whether it was covered by an expectation of confidentiality.").

The present situation parallels aspects of the situation in *Kyocera Wireless Corp. v. Int'l Trade Comn'n*, 545 F.3d 1340, 1351 (Fed. Cir. 2008), which involved a GSM standards publication, wherein the court noted "the primary purpose of the GSM standard was to develop a system interoperable across national borders. This purpose made it crucial to grant access to any interested parties." *See id.* at 1350–51 (standard documents, drafted within technical subcommittees of a standards drafting organization which did not impose restrictions on members, were sufficiently accessible to the public interested in the art to be considered publicly available).

Based on the listserv evidence and other evidence noted, Petitioner shows by a preponderance of evidence, including the testimony of Dr. Vetro and Mr. Bross and other corroborating evidence, that companies, universities, and other institutions sent representatives to the JCT-VC to promulgate and track world-wide standards, so that companies and individuals could comply with the new HEVC standards, and JCT-VC published standards documents without any restrictions as to further dissemination, making the standards documents accessible to interested artisans outside of the JCT-VC. *See* Pet. 17; Ex. 1002 ¶¶ 198–202; Ex. 1058 ¶ 23; Ex. 1078 ¶¶ 10–11; Exs. 1080–1083; Ex. 1087; Ex. 1021; Ex. 1025. The well-known desire to conform emerging products to world-wide ISO

standards generated by "[e]xperts from all over the world" to "help companies to access new markets" (*see* Ex. 1025, 1), coupled with the evidence showing an intent to make the documents public, with no expectation of confidentiality (Ex. 1021, 2), coupled with evidence regarding some routine search functionality, coupled with evidence of discussion of the documents during meetings, shows public availability to members of the relevant public including artisans of ordinary skill interested in the subject matter of high efficiency video coding.

Having reviewed Patent Owner's remaining arguments and supporting evidence, in light of the record as summarized above, we determine that Petitioner shows by a preponderance of evidence that WD4-v3, Park, and Zhou were publicly accessible so that persons interested and ordinarily skilled in the art of video coding, exercising reasonable diligence, should have been able to locate them. Therefore, Petitioner shows persuasively that WD4-v3, Park, and Zhou constitute prior art printed publications under 35 U.S.C. § 102(a).

4. Overview of WD4-v3

WD4-v3 describes a decoding process for motion information coded in inter-prediction mode using HVEC. *See* Ex. 1005, 86, 108, 111–12[28]; Ex. 1002 ¶¶ 41–43. WD4-v3 discloses

> constructing a motion vector predictor candidate list mvpListLX using available motion vector predictor candidates mvLXN (with N being A or B) from neighboring prediction unit partitions and available temporal luma motion vector predictor mvLXCol. (*Id.* at 120–121 (subclause 8.4.2.1.7).) In the derivation process for temporal luma motion vector prediction to generate the temporal motion vector predictor mvLXCol, *WD4-v3* discloses that the

[28] We cite the exhibit page numbers added by Petitioner.

> temporal motion vector predictor mvLXCol is set to a motion vector mvCol of a first available co-located prediction unit colPu from among a right-bottom candidate block covering a "[r]ight-bottom luma position of the current prediction unit" and a center candidate block covering a "[c]entral luma position of the current prediction unit." (*Id.* at 124 (subclause 8.4.2.1.9, "Variable colPu and its position (xPCol, yPCol) are derived in the following ordered steps: [steps 1–4]"; *see also id.* (equation 8-144).)

Ex. 1002 ¶ 43 (quoting Ex. 1005).

5. Overview of Zhou

Zhou, an input document to the JCT-VC, discloses a method of selecting temporal motion vectors based on the position of a current block being decoded (current prediction unit). *See* Ex. 1002 ¶ 166 & n.26; Ex. 1007, Abstract, Fig. 4. Zhou's compression scheme reduces memory bandwidth relative to prior proposals considered by the JCT-VC. *See* Ex. 1007, Abstract.

Mr. Bross produces the following annotated version of Zhou's Figure 4, as Demonstrative E, reproduced below.

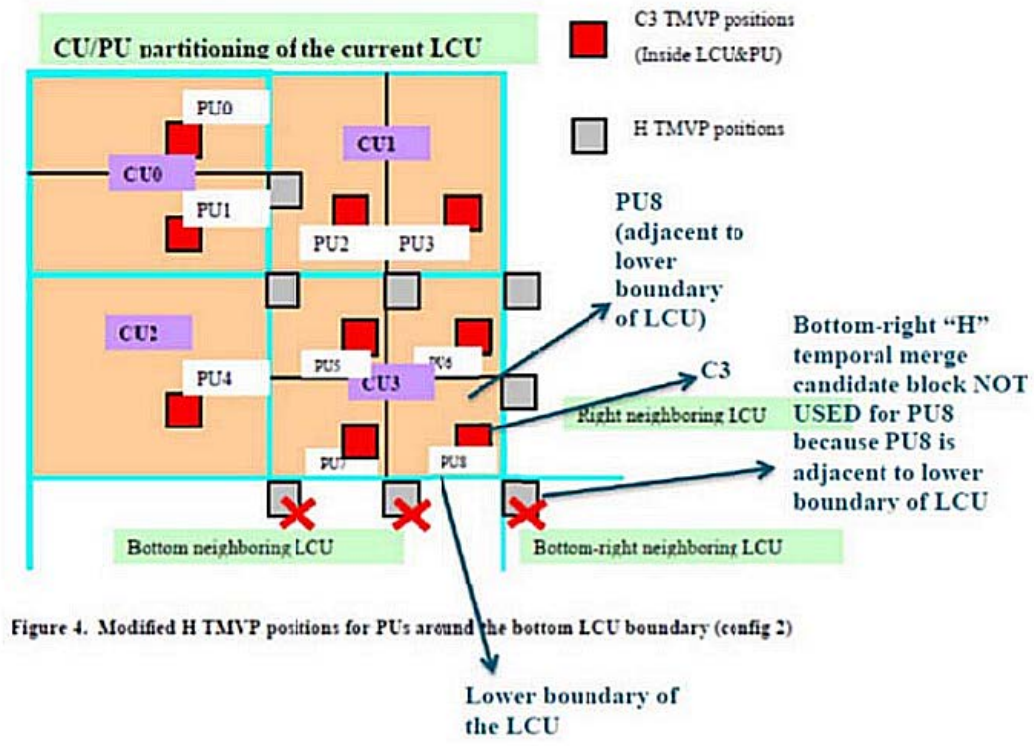


Figure 4. Modified H TMVP positions for PUs around the bottom LCU boundary (config 2)

DEMONSTRATIVE E

See Ex. 1002 ¶ 166. Mr. Bross explains that Demonstrative E represents selecting second candidate block C3 as a temporal motion vector of a predetermined block to be decoded, instead of selecting H, based on the position of PU8 (a current prediction unit) near the lower boundary of the LCU (represented by sky blue lines). *See id.*; Ex. 1007, Abstract, 4.

6. Overview of Park

Park, an input document to the JCT-VC, proposes modifying the temporal motion vector compression scheme and position of the temporal

motion vector predictor employed in prior HEVC schemes. *See* Ex. 1006, Abstract; Ex. 1002 ¶ 146.

Park discloses that in the then-currently adopted scheme, an "upper left position of the center in the block was used as a temporal mv predictor instead of the origin of the block in AMVP process"—i.e., as considered in WD4-v3. *See* Ex. 1006, 4 ("Centered temporal predictor was already adopted in the last meeting."); Ex. 1002 ¶ 147.

Park discloses the following Figure 5 to illustrate its proposed changes to HEVC:

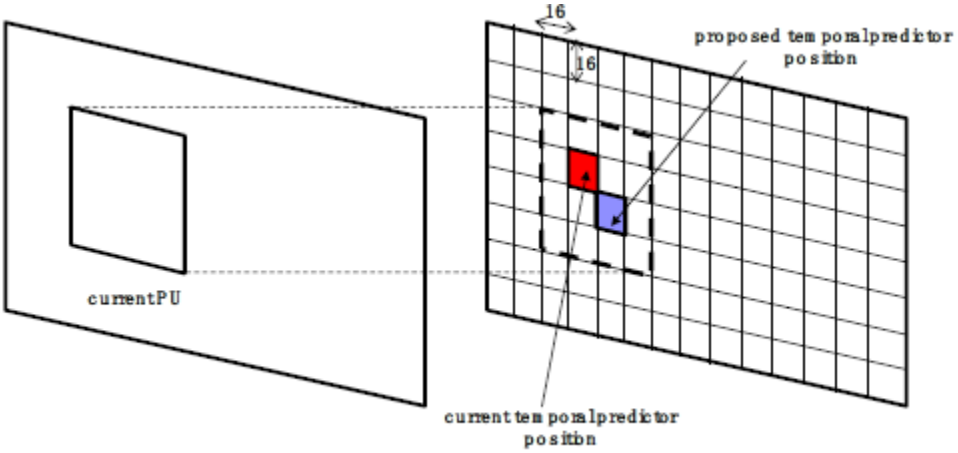


Figure 5. Changing position of centered temporal predictor

Figure 5 represents Park's proposed change to the then-current temporal mv predictor from an upper-left block position to a lower-right block position surrounding the center of the prediction unit (PU). Park states that the new position provides a coding gain. Ex. 1006, 8.

7. Claim 1, Anticipation by WD4-v3

Step a, the preamble of claim 1, recites "[a] method for decoding a moving picture."[29] Petitioner persuasively reads the preamble on several disclosures in WD4-v3, including "[t]he process specified in this Recommendation | International Standard [(*WD4-v3*)] . . . reads a *bitstream* and derives *decoded picture*s from it." Pet. 26 (quoting Ex. 1005, 16; citing Ex. 1005, 15 (definition 3.11 defining "bitstream"), 16 (definition 3.29 defining "decoded picture")). Petitioner persuasively adds "WD4-v3 . . . discloses that the purpose of the recommendations was 'in response to the growing need for higher compression of moving pictures for various applications such as videoconferencing, digital storage media, television broadcasting, internet streaming, and communication.'" *Id.* at 26–27 (quoting Ex. 1005, 13). Finally, Petitioner persuasively contends WD4-v3 "discloses a decoding process in clause 8 that decodes moving pictures, including a decoding process for coding units coded in inter prediction mode in subclause 8.4 and a derivation process for motion vector components in subclause 8.4.2.1." *Id.* at 27 (citing Ex. 1005, 86).

Step b of method claim 1 recites "a step of generating a prediction block of a current prediction unit." Petitioner persuasively relies on WD4-v3's disclosed inter prediction mode:

> For example, the inputs to the decoding process for prediction units in inter prediction mode specified in subclause 8.4.2 include a luma location (xB, yB) specifying the top-left sample of the ***current prediction unit*** relative to the top left luma sample of the current coding unit, parameters specifying the width and height of the ***current prediction unit***, along with a variable

[29] As noted *supra*, we added reference letters to claim 1 to track Petitioner's nomenclature designating limitations a–j.

> PartIdx specifying the index of the ***current prediction unit*** within the current coding unit. (Ex. 1005, 110 (subclause 8.4.2).) The outputs of this decoding process include ***an (nCS_L)x(nCS_L) array $predSamples_L$ of luma prediction samples*** ("prediction block") of the current prediction unit ("current prediction unit"). (*Id*.)

Pet. 28–29 (citing Ex. 1002 ¶¶ 73–74).

According to Petitioner, based on this disclosure, a person of ordinary skill in the art

> would have understood from the disclosure of *WD4-v3* that the array $predSamples_L$ discloses a "prediction block" of a current prediction unit as claimed because, e.g., the $predSamples_L$ array is subsequently used in conjunction with the residual signal (e.g., array resSamplesL) in *WD4-v3* to reconstruct the current picture.

Id. at 29 (citing Ex. 1005, 108 (subclause 8.4, steps 2–4); Ex. 1002 ¶¶ 75–76).

Step c of claim 1 recites "a step of generating a residual block of the current prediction unit." Petitioner persuasively reads the step on WD4-v3's disclosure of "generating an array $resSamples_L$ of luma residual samples ('residual block') of the current prediction unit." *See* Pet. 29–30 (citing Ex. 1002 ¶¶ 77–80; Ex. 1005, 108, 133). Petitioner persuasively relies partly on WD4-v3's disclosure that "[t]he '[o]utput of this process is a modified reconstructed picture before deblocking filtering.'" *Id*. (quoting Ex. 1005, 108). Petitioner persuasively explains a residual block includes "the (nCS)x(nCS) array of luma residual samples ('residual block') of the current prediction unit ('current prediction unit')." *Id*. at 30 (citing Ex. 1005, 133; Ex. 1002 ¶ 80).

The decoding process "output" results in "a modified reconstructed picture before deblocking filtering." *Id*. at 29 (quoting Ex. 1005, 108). To generate the reconstructed picture, "[t]he ***decoding process for the residual***

signal of coding units coded in inter prediction mode specified in subclause 8.4.3 is invoked with the luma location (xC, yC) [and] the size of the current coding unit log2CUSize as inputs[,] and ***the outputs are 3 arrays*** $\boldsymbol{resSamples_L}$, $resSamples_{Cb}$, [and] $resSamples_{Cr}$." *Id.* at 29–30 (quoting Ex. 1005, 108; citing Ex. 1002 ¶ 78) (emphasis by Petitioner).

Step d recites "wherein the step of generating a prediction block of the current prediction unit comprises the steps of" steps e–j, which we analyze next.

Step e recites "obtaining a reference picture index and motion vector difference of the current prediction unit from a received bit stream."

Petitioner persuasively reads step e on WD4-v3's disclosure of

> a list 0 reference picture index "ref_idx_l0" for the current prediction unit and a list 1 reference picture index "ref_idx_l1" for the current prediction unit (individually or collectively, "reference picture index") and a difference "mvd_l0" between a list 0 motion vector component to be used and its prediction for a current prediction unit and a difference "mvd_l1" between a list 1 motion vector component to be used and its prediction (individually or collectively, "motion vector difference") for a current prediction unit. (Ex. 1002, ¶¶82–87.) (Ex. 1005, 80 (subclause 7.4.7).)

Pet. 31. Petitioner persuasively explains that the received bit stream includes a prediction unit syntax from which the process obtains the noted indexes and motion vector differences, further noting that WD4-v3 defines them as syntax elements and defines a syntax element as "[a]n element of data represented in the bitstream." *See id.* at 31–33 (quoting Ex. 1005, 20; citing Ex. 1005, 49–50, 111; Ex. 1002 ¶¶ 85–86).

Step f recites "constructing a motion vector candidate list using available spatial and temporal motion vector candidates." Petitioner

persuasively reads WD4-v3's disclosure of mvLXN (with N = A or B) onto the available spatial motion vector candidates, and mvLXCol onto temporal motion vector candidates. *See* Pet. 33–34 (citing Ex. 1005, 120–22; Ex. 1002 ¶¶ 88–91). Petitioner persuasively contends

> as a POSITA would have understood, because *WD4-v3* discloses that the motion vector predictor candidates mvLXA or mvLXB and the motion vector predictor mvLXCol are used to construct the mvpListLX if the corresponding availableFlagLXA or avaialbleFlagLXB or availableFlagLXCol is equal to 1, these motion vector predictor candidates mvLXA/mvLXB and the motion vector predictor mvLXCol are used only when they are "available," as claimed. (Ex. 1005, 120 (subclause 8.4.2.1.7, steps 1–3).) (Ex. 1002, ¶91.)

Pet. 35.

Step g recites "adding zero vector to the motion vector candidate list if a number of the available motion vector candidates is smaller than a predetermined number." Addressing step g, Petitioner persuasively contends WD4-v3 "discloses adding a zero motion vector predictor candidate ('zero vector') to the motion vector predictor candidate list mvpListLX ('motion vector candidate list') if the number of elements numMVPCandLX within mvpListLX ('a number of the available motion vector candidates') is smaller than maxNumMVPCand ('a predetermined number')." *Id.* at 35 (citing Ex. 1005, 121, 125; Ex. 1002 ¶¶ 92–96). Petitioner persuasively quotes steps outlined in WD4-v3 in support of this contention as follows: step 6) "The variable numMVPCandLX is set to the number of elements within the mvpListLX and maxNumMVPCand is set to 2"; and step 7) "The motion vector predictor list is modified to contain exactly maxNumMVPCand motion vector predictor candidates." *Id.* at 35–36 (quoting Ex. 1005, 121).

Quoting WD4-v3 further to address the zero vector "if" limitation of step g, Petitioner explains

> *WD4-v3* discloses that "[i]f numMVPCandLX is less than maxNumMVPCand, the derivation process for zero motion vector predictor candidates specified in subclause 8.4.2.1.10 is invoked." [Ex. 1005, 121]. In the derivation process for zero motion vector predictor candidates, "[w]hen no motion vector in mvpListLX is equal to (0,0), the zero motion vector predictor candidate is added at the end of mvpListLX." (Ex. 1005, 125 (subclause 8.4.2.1.10)[]).

Id. at 36 (citing Ex. 1002 ¶¶ 94–96).

Step h recites "determining a motion vector candidate indicated by a motion vector index as a motion vector predictor and restoring a motion vector of the current prediction unit using the motion vector difference and the motion vector predictor." Petitioner persuasively reads the recited "motion vector candidate list," "motion vector index," and "motion vector predictor" of step h respectively onto WD4-v3's disclosure of mvpListLX, mvp_idx_l0 or mvp_idx_l1, and mvpLX. *Id*. (citing Ex. 1005, 78, 80–81, 111–12, 120–21; Ex. 1002 ¶¶ 97–101).

Addressing the remaining elements of step h, Petitioner persuasively contends "*WD4-v3* . . . discloses restoring motion vectors mvL0 and mvL1 (individually or collectively the claimed 'motion vector') of the current prediction unit specified by luma location (xB, yB) ('current prediction unit') using the motion vector difference mvd_lX ('motion vector difference') and the motion vector predictor mvpLX ('motion vector predictor'). *Id*. at 36–37 (citing same). After providing further analysis based on disclosures in WD4-v3, Petitioner persuasively explains that "the encoded motion vectors are necessarily restored given *WD4-v3* discloses determining motion vectors for a current prediction unit during the decoding

process and discloses that the purpose of *WD4-v3's* decoding process is to 'reconstruct[]' a moving picture." *Id.* at 38–39 (citing Ex. 1005, 108; Ex. 1002 ¶ 101).

Step i recites "generating a prediction block of the current prediction unit using the restored motion vector and the reference picture index." Petitioner reads the recited "prediction block" onto WD4-v3's "an (nCS_L) x(nCS_L) array predSamplesL of luma prediction samples of the current prediction unit." Pet. 40 (citing Ex. 1005, 110). Petitioner persuasively relies on its showing with respect to the same claim elements in related phrases discussed above, reading the claimed "reference picture index" and "restored motion vector" respectively onto WD4-v3's disclosure of "ref_idx_lX" and "the luma motion vectors mvLX." *See id.* at 39 (citing Ex. 1002 ¶ 103).

According to Petitioner,

> as discussed above with respect to claim element 1(b) [*see* Pet. 27–29], the output of the decoding process for prediction units in inter prediction mode includes an (nCSL)x(nCSL) array predSamplesL of luma prediction samples ("prediction block") of the current prediction unit ("current prediction unit"). (Ex. 1005, 110 (subclause 8.4.2).) This decoding process further discloses that the (nCSL)x(nCSL) array predSamplesL of luma prediction samples is generated in the decoding process for inter sample prediction (specified in subclause 8.4.2.2) based on the reference picture indices ref_idx_lX and the luma motion vectors mvLX. (Id., 110–111 (subclause 8.4.2).) (Ex. 1002, ¶¶104–106.)

Id. at 40 (emphasis omitted).

Step j recites "wherein the temporal motion vector candidate is a first available motion vector encountered when retrieving two blocks corresponding to the current prediction unit or a motion vector of a predetermined block." Petitioner persuasively contends the "or" in step j

only requires a showing of a disclosure of the temporal motion vector candidate as a first available motion vector encountered after *only one* of the alternatives recited after the "when retrieving" predicate occurs. *See* Pet. 40–41 (citing *Ex parte Hadar et. al.*, No. 2015-001412, 2016 WL 4151075, at *7 (PTAB July 28, 2016) ("When a claim covers several alternatives, the claim may be unpatentable if any of the alternatives within the scope of the claim are taught by the prior art.").

Petitioner asserts WD4-v3 discloses "at least the first alternative, i.e., that the temporal motion vector candidate is a first available motion vector encountered when retrieving two blocks corresponding to the current prediction unit."[30] Pet. 41. Referring to its analysis of "claim element 1(f)," Petitioner explains that WD4-v3 discloses setting a temporal motion vector candidate to a first available of "two blocks" corresponding to the "current prediction unit," with the location of the two blocks depending on the coordinates (xP, yP) of the current prediction unit, as follows:

> *WD4-v3* discloses that the temporal motion vector predictor mvLXCol ("temporal motion vector candidate") is set to a motion vector mvCol of a first available co-located prediction unit colPu from among a right-bottom candidate block covering a "[r]ight-bottom luma position of the current prediction unit" and a center candidate block covering a "[c]entral luma position of the current prediction unit." (Ex. 1005, 124 (subclause 8.4.2.1.9).) The right-bottom candidate block is defined by coordinates (xPRb, yPRb) and a center candidate block is defined by coordinates (xPCtr, yPCtr). (*Id*. (subclause 8.4.2.1.9, steps 1 and 3).) The right-bottom candidate block and the center candidate block disclose the claimed "two blocks" corresponding to the current prediction unit since the coordinates defining their

[30] As discussed further below in the discussion of claim 3, Petitioner contends the second alternative would have been obvious. Pet. 41 n.10.

> location (i.e., (xPRb, yPRb) or (xPCtr, yPCtr)) are dependent on the coordinates (xP, yP) of the current prediction unit. (*Id.* (equations 8-140 through 8-143).) (Ex. 1002, ¶¶109–111.)

Pet. 41–42.

Petitioner also explains persuasively that WD4-v3 discloses an ordered process for selecting the temporal motion vector candidate:

> *WD4-v3* is based on "ordered steps" where the right-bottom luma position of the current prediction unit is first checked (*id*. (steps 1-2)) and if colPu cannot be set to the right-bottom luma position because it is unavailable or coded in an intra prediction mode (*id.* (step 3)), then colPu is set to the central luma position of the current prediction unit. (*Id*. (steps 1–3).) As Mr. Bross explains, *WD4-v3* further discloses that the motion vector mvCol of the colPu (i.e., the first available candidate block from among the right-bottom and center blocks) is set as the temporal motion vector predictor mvLXCol. (Ex. 1002, ¶¶112–114.)

Id. at 42–43.

In summary, Petitioner persuasively shows that WD4-v3 describes an HVEC process materially similar to the process as disclosed and claimed in the '163 patent and that WD4-v3 anticipates claim 1. *See* Pet. 26–43. The record, including the credible testimony of Mr. Bross and WD4-v3, supports Petitioner. Patent Owner does not respond to Petitioner's assertions, other than as noted above, challenging the printed publication prior art status of WD4-v3. *See supra* § II.C.1. Accordingly, we determine that Petitioner demonstrates by a preponderance of evidence that WD4-v3 anticipates claim 1.

8. Dependent Claims 2, 5, and 6—Alleged Anticipation by WD4-v3

Claims 2 and 5 depend from claim 1. Claim 2 follows:

> 2. [a] The method of claim 1, wherein the two blocks comprises a first candidate block and a second candidate block,

> [b] the first candidate block is a below right corner block or a below right block which corresponds to the current prediction unit and exits [sic: exists] in a temporal motion vector candidate picture, and
>
> [c] the second candidate block is a center block which includes an upper left pixel or a below left pixel of center position of the center block corresponding to the current prediction unit and is included in the temporal motion vector candidate picture.

See Pet. 43–45 (designating clauses or steps a–c of claim 2 as represented above).

Regarding clauses a and b, Petitioner persuasively shows "the first candidate . . . below right corner block" reads on WD4-v3's disclosure of a "[r]ight-bottom luma position of the current prediction unit," which "exists in in a co-located picture colPic," upon which the claimed "temporal motion vector candidate picture" reads. *See* Pet. 44 (citing Ex. 1002 ¶ 117 (discussing Demonstrative F)). Petitioner persuasively explains further:

> [T]he right-bottom candidate block is set as the prediction unit adjacent (i.e. below right or right bottom) to the co-located prediction unit colPu if it is determined to be available. (Ex. 1005, 124 (subclause 8.4.2.1.9, steps 1–2); *see also* analysis for claim element 1(j).) *WD4-v3* discloses that "[t]he variable colPu is set as the prediction unit covering the modified position . . . *inside the colPic*." (*Id.* (step 2) (emphasis added); *id.*, 123–124, *id*. (step 4).) (Ex. 1002, ¶118.)

Pet. 44.

Regarding clauses a and c, Petitioner persuasively reads the claimed "second candidate block . . . upper left pixel" of a center block onto WD4-

v3's disclosure of a pixel defined by (xPCtr, yPCtr). *See id.* at 46.[31] Relying on the testimony of Mr. Bross and his discussion of Demonstrative G, Petitioner persuasively explains that WD4-v3's disclosure mimics the disclosure related to Figure 5 of the '163 patent. *See id.* at 47.

Claim 5 depends from claim 1 and claim 6 depends from claim 5. Claim 5 further limits "the step of generating a residual block of the current prediction unit" by "entropy-decoding residual signals," "inversely scanning the residual signals using a first scan pattern," "inversely quantizing a quantized transform block to restore a transform unit," and "inversely transforming the transform unit."

Petitioner and Mr. Block persuasively point to WD4-v3's disclosure of entropy decoding, and inversely scanning, quantizing, and transforming "the (nW)x(nH) array of scaled (inverse quantized) transform coefficients d_{ij} into a (nW)x(nH) array of residual samples r." *See* Pet. 51, 48–51 (citing Ex. 1005, 129–38; Ex. 1002 ¶¶ 136–138).

Claim 6 depends from claim 5 recites "wherein if a size of the transform unit is larger than a first reference size, the residual signals are inversely scanned in the unit of subsets." Petitioner persuasively reads this step onto WD4-v3's disclosure of dividing a current transform unit into subsets of 4x4 subdivisions and then scanning the subsets per a zig-zag scan order. *Id.* at 51–52 (citing Ex. 1005, 137; Ex. 1002 ¶ 141). Regarding the "if" condition, Petitioner persuasively contends "a POSITA would have

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[31] Claim 2c recites "the second candidate block is a center block which includes *an upper left pixel or a below left pixel* of center position of the center block." (Emphasis added). Petitioner shows persuasively this clause only requires "an upper left pixel" under this anticipation ground. *Id.* at 45 & n.13.

understood that in *WD4-v3*, the current transform unit would necessarily be divided into subsets of 4x4 samples if the size of the current transform unit is larger than 4x4 ('first reference size')." *Id.* at 52–53 (citing Ex. 1002 ¶¶ 142–143).

In summary, Petitioner persuasively shows that WD4-v3, which discloses an HVEC standard similar to the process disclosed in the '163 patent, anticipates claims 2, 5, and 6. *See* Pet. 43–53. Patent Owner does not respond to Petitioner's assertions, other than as noted above, challenging the printed publication prior art status of WD4-v3. *See supra* § II.C.1. Based on a review of the record as summarized above, we determine that Petitioner shows by a preponderance of evidence that WD4-v3 anticipates claims 2, 5, and 6.

9. Dependent Claim 2—Alleged Obviousness, WD4-v3 and Park

Petitioner addresses claim 2 under an alternative obviousness analysis that involves addressing the alternative that claim 2, which recites "the second candidate block is a center block which includes *an upper left pixel or a below left pixel*" (emphasis added), requires *both* "an upper left pixel" and "a below left pixel." *See* Pet. 53, 46 & n.12. Claim 2, reciting the upper and lower pixels in the alternative, does not require both "an upper left pixel" and a "below left pixel." Accordingly, our finding of anticipation above renders this challenge moot.

10. Dependent Claims 3 and 4—Alleged Obviousness, WD4-v3, Park, and Zhou

Claim 3 recites "[t]he method of claim 2, wherein the predetermined block is the second candidate block." Claim 3 implicitly refers back to claim 1, which recites "wherein the temporal motion vector candidate is a

first available motion vector encountered when retrieving two blocks . . . or *a motion vector of a predetermined block*." (Emphasis added). Claim 3 also refers back to "the second candidate block" of claim 2, which also refers back to claim 1, and recites "the second candidate block is a center block which includes an upper left pixel or a below left pixel of center position of the center block corresponding to the current prediction unit and is included in the temporal motion vector candidate picture."

Claim 3 defines the predetermined block recited in limitation (j) of claim 1 to be the second candidate block. As noted by Petitioner, claim element 1(j) uses the conjunction "or" to recite two alternatives for what the "temporal motion vector candidate" can be—"a first available motion vector encountered when retrieving two blocks corresponding to the current prediction unit" *or* "a motion vector of a predetermined block." Pet. 40. Although claim 3 defines the predetermined block to be "the second candidate block," it does not require that the "temporal motion vector candidate" be "a motion vector of the second candidate block" (second alternative of limitation 1(j)). Rather, the "temporal motion vector candidate" limitation of claim 3 (inherited through its dependency from claim 1) may still be met under the first alternative (i.e., wherein the temporal motion vector candidate is a first available motion vector encountered when retrieving two blocks corresponding to the current prediction unit). For the reasons discussed above, Petitioner persuasively establishes WD4-v3 discloses both the first available motion vector alternative and the second candidate block. Petitioner also shows that WD4-v3 discloses the second candidate block as including an upper left pixel of the center position of the center block corresponding to the current

prediction unit, and shows that WD4-v3 discloses using that current prediction unit as the temporal motion vector predictor, thereby meeting the predetermined block limitation of claim 3. *See id.* at 53–54. Accordingly, Petitioner establishes that WD4-v3 anticipates claim 3. Patent Owner does not present separate arguments for this claim.[32]

Claim 4 recites "[t]he method of claim 2, wherein, if the current prediction unit is located at lower boundary of a slice or a largest coding unit, a motion vector of the second candidate block is determined as the temporal motion vector candidate of the current prediction unit." Petitioner persuasively shows the WD4-v3-Park-Zhou combination discloses that if the current prediction unit (e.g., "PU8" like that disclosed by Zhou) is located at a lower boundary of the LCU ("largest coding unit"), a motion vector of the center candidate block (second candidate block) is determined as the temporal motion vector predictor of the current prediction unit. Pet. 67–68. Petitioner also provides sufficiently persuasive rationale to support the combination. *See id.*

In summary, Petitioner persuasively shows that WD4-v3, Park, and Zhou, which teach developments in the HVEC standard process, similar to the process disclosed in '163 patent, would have rendered obvious claim 4. *See id.* Patent Owner does not respond to Petitioner's showing, other than as noted above, challenging the printed publication prior art status of WD4-v3, Park, and Zhou.

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[32] "[A] disclosure that anticipates under § 102 also renders the claim invalid under § 103, for 'anticipation is the epitome of obviousness.'" *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed.Cir.1983) (citing *In re Fracalossi*, 681 F.2d 792 (CCPA 1982)).

Based on a review of the record as summarized above, we determine that Petitioner demonstrates by a preponderance of evidence that claims 3 and 4 would have been obvious over WD4-v3, Park, and Zhou.

11. Summary

Petitioner shows by a preponderance of evidence that WD4-v3 anticipates claims 1, 2, 5, and 6; and the combination of WD4-v3, Park, and Zhou renders obvious claims 3 and 4. With respect to the obviousness challenges, Petitioner articulates a persuasive rationale for combining the teachings of the references. *See* Pet. 58–68.

D. Motion to Exclude

Patent Owner filed a Motion to Exclude Evidence Pursuant to 37 C.F.R. § 42.64 (Paper 33, "Motion" or "Mot."); Petitioner filed an Opposition to Patent Owner's Motion to Exclude Evidence (Paper 38, "Opposition" or "Opp."); and Patent Owner filed a Reply in Support of its Motion to Exclude Evidence Pursuant to 37 C.F.R. § 42.64 (Paper 39, "Reply Motion" or "Reply Mot.").

Patent Owner seeks to exclude certain testimony by Mr. Bross, namely paragraphs 10 and 11 of his Supplemental Declaration (Ex. 1078). Patent Owner's Motion alleges that testimony constitutes inadmissible hearsay and lacks a proper foundation, as follows:

> Mr. Bross, testifying as a fact witness . . . alleges that "persons experienced and skilled, and interested, in video coding technologies were tracking the developments of the latest video coding standard by regularly visiting the JCT-VC site to ensure that products and services they were developing were consistent with the HEVC Standard under development." Ex 1078, ¶ 10.
>
> The basis for this assertion is <u>not</u> first-hand knowledge as required under FRE 602, but inadmissible hearsay under FRE

> 801 and 802. Specifically, Mr. Bross alleges in paragraph 11 that "I know this to be true because I recall discussions with persons experienced in video coding in the 2011 timeframe about the HEVC Standard. . . [.]" Ex 1078, ¶ 11. Mr. Bross further alleges that he recalls interactions with representatives from Allegro DVT, Qualcomm and Broadcom. *Id.*, ¶ 11.

Mot. 2.

Petitioner contends the Motion must fail because Patent Owner's objections lacked particularity. Opp. 2. According to Petitioner,

> Patent Owner's objection generally identified Exhibit 1078 (Mr. Bross' nineteen page, twenty-two paragraph Supplemental Declaration) and consisted of a laundry list of objections to this exhibit. (Paper 23 at 1.) Such generalized objections are not sufficient to support Patent Owner's specific objections to paragraphs 10 and 11 in its Motion (Motion at 2–3), as Petitioner did not have sufficient notice to cure the alleged deficiencies via supplemental evidence.

Opp. 2.

Under 37 C.F.R. § 42.64(b)(1) "[t]he objection must identify the grounds for the objection with sufficient particularity to allow correction in the form of supplemental evidence." *See* Opp. 2. We agree with Petitioner that Patent Owner's objections do not identify with particularity the grounds for the objection.

In any event, we need not reach the propriety of the form of the objection. As discussed below, the statements to be excluded do not constitute hearsay because the statements (1) are not offered for the truth of the matter asserted or (2) they fall under a hearsay exception. Also, regarding Federal Rule of Evidence 602 ("[e]vidence to prove personal knowledge may consist of the witness's own testimony"), as Petitioner explains, Mr. Bross's statements "provide[] the foundation for his belief that

engineers and other individuals in major technology companies with experience in video coding, were tracking the developments of the HEVC standard and the Working Drafts on the JCT-VC site." Opp. 6 (citing Fed. R. Evid. 801(c), 1997 Adv. Comm. Note.) ("[T]he significance of [those statements] lies solely in the fact that [they were] made.")).

At issue here, the public dissemination of documents, concerns what documents interested artisans exercising reasonable diligence should have been able to locate "if they wanted to." *See GoPro*, 908 F.3d at 693 ("[W]e explained that '[a]ccessibility goes to the issue of whether interested members of the relevant public could obtain the information if they wanted to' and '[i]f accessibility is proved, there is no requirement to show that particular members of the public actually received the information.'" (quoting *Constant*, 848 F.2d at 1569)). Here, Mr. Bross's testimony shows that engineers knew about the JCT-VC web-site, and also, possessed the plan, motive, or intent to track and locate documents on the JCT-VC website, but none of their statements are being offered for the truth of the matter asserted, or if they are, they fall under a hearsay exception. *See* Ex. 1078 ¶¶ 10–11.

As one example, Mr. Bross testifies that interested artisans made specific inquiries about the website, namely "inquiries . . . regarding when they could expect the next update to the Working Draft of the HEVC Standard to be uploaded to the JCT-VC site and circulated on the JCT-VC listserv." Ex. 1078 ¶ 11. These inquiries do not constitute hearsay, rather they constitute a verbal act or non-hearsay. In other words, asking about when updates could be uploaded to the JCT-VC websites carries significance regardless of the truth of the statement, because it shows

awareness of the website and the standards. *See* Fed. Rule Evid. 801, Notes of Advisory Committee on Proposed Rules Subdivision C ("If the significance of an offered statement lies solely in the fact that it was made, no issue is raised as to the truth of anything asserted, and the statement is not hearsay."). Also these inquiries, as questions, do not constitute statements intended as assertions. *See* Fed. Rule 801 (c) ("'Statement' means a person's oral assertion, written assertion, or nonverbal conduct, if the person intended it as an assertion.").

As another example, Mr. Bross testifies "I recall that the inquiry from the representative of Allegro DVT included questions about potential bugs they found in at least one of the Working Drafts on the JCT-VC site, which showed me at that time the person's careful review of the then development of the working drafts." Ex. 1078 ¶ 11. Petitioner does not offer these *questions* about bugs as *assertions* that one of the Working Drafts on the JCT-VC site included bugs, but rather as circumstantial evidence that the Allegro DVT representative visited the website or planned to visit it at various times. As another example, Mr. Bross recalls conversations about an expected release date of a Working Draft by representatives from Qualcomm and Broadcom, "including [conversations about] how the proposed coding specification in the Working Draft would affect their products and services." *See id.* Petitioner does not offer this statement as an assertion to show that "the proposed coding specification in the Working Draft would affect . . . products and services," but rather to show that engineers possessed an ongoing belief while talking to Mr. Bross regarding the proposed coding, thereby circumstantially showing they had a plan, motive, or an intent to obtain documents on the JCT-VC site to ensure

produce compliance. *See* Opp. Reply 5–6 (citing *Lyons P'ship, L.P. v. Morris Costumes, Inc.*, 243 F.3d 789, 804 (4th Cir. 2001) ("[Plaintiff] did not offer the children's statements or the newspaper articles to prove the truth of the matter asserted—i.e., that the persons wearing the Duffy costume were in fact Barney—but rather merely to prove that the children and the newspaper reporters expressed *their belief* that those persons were Barney. This was direct evidence of the children's and the reporters' reactions and not hearsay.")).[33]

As another example, Mr. Bross testifies as follows:

> For example, I recall discussions from Broadcom engineers that included their comments on the impact the proposed changes in the Working Drafts may have on the video-coding related circuitry for Broadcom. These recollections further confirm my knowledge and recollection that persons skilled and interested in video coding technologies during the 2011 timeframe would have had reason to, and did, regularly visit the JCT-VC site to review[ing] the Working Drafts of the HEVC Standard to ensure that products and services they were developing were consistent with the HEVC Standard under development.

Ex. 1078 ¶ 11.

Mr. Bross's statement that "Broadcom engineers . . . would have had reason to, and did, regularly visit the JCT-VC site to reviewing the Working Drafts of the HEVC Standard to ensure that products and services they were developing were consistent with the HEVC Standard under development"

[33] *Lyons* also cites the presence sense impression exception to hearsay. *See* Fed. R. Evid. 803(1) (creating an exception to hearsay rule for a statement about "an event or condition made while the declarant was perceiving the event or condition, or immediately thereafter"). *Lyons*, 243 F.3d at 804.

simply does not constitute hearsay, because Mr. Bross makes the statement in his trial testimony here. *Id.*

In addition, Mr. Bross's testimony as quoted above does not rely on any hearsay statements by the Broadcom engineers, or any such statements fall under a hearsay exception. *See id.* Patent Owner does not explain sufficiently how any statements by the Broadcom engineers or other representatives constitute hearsay. Mr. Bross's testimony summarizing conversations about "the impact the proposed changes in the Working Drafts may have on the video-coding related circuitry for Broadcom" involving the Broadcom engineers (*see id.*) is not offered as an assertion to show that the Working Drafts may have had an impact on the Broadcom circuitry. Rather Petitioner offers the statements as circumstantial evidence tending to show a then-existing state of mind and reason, plan, or intent by engineers or representatives to visit the JCT-VC website, thereby providing a factual basis supporting Mr. Bross's testimony.

Stated another way, similar to the non-hearsay statements in *Lyons*, Petitioner does not offer the statements by the engineers or representatives to prove the truth of the matter asserted, for example, that certain JCT-VC documents included bugs or that certain standards would affect products and services or that the engineers actually visited the website, but the statements show that the engineers or representatives believed, while talking to Mr. Bross (and prior to the conversations), that following procedures in documents on the JCT-VC website might alter their products or result in programming bugs. The then-existing belief or state of mind also shows circumstantially that the engineers and representatives had a then-existing reason, plan, or intent to visit the JCT-VC website—further showing they

should have been able to find the documents because "they wanted to." *See GoPro*, 908 F.3d at 694; Fed. R. Evid. 801(c) (limiting the definition of hearsay to statements offered "to prove the truth of the matter asserted"); Fed. R. Evid. 803(1) (creating an exception to hearsay rule for a statement about "an event or condition made while or immediately after the declarant perceived it"); Fed. R. Evid. 803(3) (creating an exception to hearsay for a "statement of the declarant's then-existing state of mind (such as motive, intent, or plan) . . . , but not including a statement of memory or belief to prove the fact remembered").[34]

Further regarding Fed. R. Evid. 803(1) and Fed. R. Evid. 803(3), no reason existed for the engineers or representatives to lie about potential bugs or workflow problems, they made statements about the bugs or the potential impact of the "latest proposed changes" on bugs or workflow to Mr. Bross during the same time as they perceived or believed the then-existing potential bugs or impact would arise if they followed the then-existing standards, and the statements provide a basis for Mr. Bross's testimony that artisans regularly visited the website and provide an inference that regular visits included an intent to visit the website and follow the standards

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[34] The use of state-of-mind evidence under Fed. R. Evid. 803(3) to determine subsequent conduct on the part of the declarant finds root in the seminal case of *Mutual Life Insurance Co. v. Hillmon*. 145 U.S. 285 (1892) (letters describing intent by Walters to travel admissible to show Walter's intent and an inference of Walter's actual travel). *See* "One Person's Thoughts, Another Person's Acts: How the Federal Circuit Courts Interpret the Hillmon Doctrine," Kiesel, Diane, Cath. U. Law Rev., V.33, Iss. 3 (1984), avail. at http://scholarship.law.edu/lawreview/vol33/iss3/10?utm_source=scholarship.law.edu%2Flawreview%2Fvol33%2Fiss3%2F10&utm_medium=PDF&utm_campaign=PDFCoverPages.

development. *See* Ex. 1078 ¶ 11; *United States v. Ponticelli*, 622 F.2d 985, 991 (9th Cir. 1980) (noting Fed. R. Evid. 803(3) "is a specialized version of Fed. R. Evid. 803(1), which permits admission of present sense impressions").[35]

Patent Owner does not address these specific statements quoted above from paragraph 11 of the Supplemental Declaration, but seeks to exclude that whole paragraph and paragraph 10. In summary, Patent Owner's Motion refers to Mr. Bross's statement about experienced persons "tracking the developments . . . by regularly visiting the JCT-VC site to ensure that products and services they were developing were consistent with the HEVC Standard under development." Mot. 2 (citing Ex. 1078 ¶ 10). Patent Owner asserts this statement and other "discussions" (*id.* (quoting Ex. 1078 ¶ 11)) and statements about "interactions with representatives from Allegro EVT, Qualcomm and Broadcom" (*id.* (citing Ex. 1078 ¶ 11)) do not represent "first-hand knowledge" and "are the epitome of inadmissible hearsay." Reply Mot. 1. However, Mr. Bross does not testify that the engineers told him they regularly visited or plan to visit the JCT-VC site. Rather, as explained above, Mr. Bross's testimony includes a relevant non-hearsay purpose or falls under a hearsay exception as a relevant belief, motive, plan,

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[35] *See Ponticelli*, 622 F.2d at 991 (outlining the requirements for admissibility of 803(3) statements: declarations must be relevant to an issue in the case, declarations must occur about same time as the event about which the speaker is commenting, and there must be no opportunity or reason for the declarant to lie about his state of mind); *overruled on other grounds by United States v. De Bright*, 730 F.2d 1255, 1259 (9th Cir.1984) (en banc); *Wagner v. County of Maricopa* 673 F.3d 977, 980 (9th Cir. 2011) (distinguishing *Ponticelli* and allowing evidence under Fed. R. Evid. 803(3)).

or intent, by the representatives or engineers, similar to the alleged hearsay statements in *Lyons* (i.e., the sentences are being offered as circumstantial evidence to support Mr. Bross's testimony that experienced persons regularly visited the site).

Under an alternative analysis, we adopt Petitioner's showing that the statements fall under the residual hearsay exception. *See* Fed. R. Evid. 809(a); Opp. 8–11. First, the statements have "equivalent circumstantial guarantees of trustworthiness." Fed. R. Evid. 807(a)(1). Mr. Bross merely explains that representatives possessed the intent to track developments of the HEVC standards on the JCT-VC server to ensure product compliance. *See* Ex. 1002 ¶ 189; Ex. 1078 ¶¶ 10–11. Dr. Vetro provides similar testimony with respect to further dissemination of HEVC documents on the MPEG server. Ex. 1058 ¶ 23. Mr. Bross provides similar unchallenged testimony about others interested in video coding, including "representatives in the video coding industry, university professors, and research institutions" as being "aware of the developments of the HEVC Standard and the open and public nature of the documentation provided by the JCT-VC, including through its JCT-VC website." Ex. 1078 ¶ 13; *see also* Ex. 1002 ¶ 189. As discussed above, other documents of record reveal the purpose for the JCT-VC server as an archive for document storage and retrieval for review of the standards documents. *See* Ex. 1021, 1–2; *supra* § II.C.3.vii–x. Other evidence also shows that emerging video coding standards typically result in new products, and non-members of JCT-VC were or should have been aware of the JCT-VC. *See* Ex. 1080, 1; Ex. 1025, 1; Exs. 1081–1083; Ex. 1087.

Second, Petitioner persuasively offers Mr. Bross's statements "as evidence of a material fact." *See* Fed. R. Evid. 807(a)(2). As indicated above, the statements tend to show that interested artisans exercising reasonable diligence should have been able to visit the website and also had a reason to do so.

Third, "Mr. Bross'[s] statements are 'more probative on the point for which [they are] offered than any other evidence that the proponent can obtain through reasonable efforts.'" Opp. 10 (quoting Fed. R. Evid. 807(a)(3)). Petitioner persuasively explains "[i]t would not have been reasonable to expect Petitioner to locate the specific individuals (who may have since switched employment), even assuming Mr. Bross could recall those individuals' names." Opp. 10. A span of about seven or eight years exists between the conversations and this proceeding, supporting Petitioner's position.

Finally, "admitting [Mr. Bross's statements] will best serve the purposes of these rules and the interests of justice." *Id.* at 10 (quoting Fed. R. Evid. 807(a)(4)) (alteration by Petitioner). As Petitioner indicates, Patent Owner cross-examined Mr. Bross about his testimony, it relates to conversations Mr. Bross testifies actually occurred, the statements relate to the question of accessibility, and allowing the statements into the record provides efficient and expedited relief, weighed under the engine of cross-examination of Mr. Bross by Patent Owner. *See* Opp. 10; Ex. 2026, 132–136 (cross-examination); *supra* § II.C.3.vi.

Patent Owner's Reply arguments do not undermine the analysis above. Patent Owner's arguments largely rest on the contention that it should have been able to cross-examine the engineers and representatives.

See Reply Mot. 4 ("Patent Owner did not have an opportunity to examine anyone claiming to have made the statements to test their recollection or the veracity of the comments attributed to them."). The residual hearsay exception does not operate to allow cross-examination of hearsay declarants. Also, Patent Owner's generalized objections, as described above, served to undermine the ability of Petitioner to locate the witnesses timely (assuming Mr. Bross could have identified them).

For the foregoing reasons, Patent Owner does not meet the burden on its Motion. In addition, even if we disregard statements by Mr. Bross in paragraphs 11 and 12 that we hold here fall under a hearsay exception or constitute non-hearsay, it would not alter the outcome, given other evidence, including (but not requiring) the evidence of a verbal act discussed above, and including other Exhibits discussed above collectively showing that interested artisans exercising reasonable diligence should have been able to visit the website and would have known it archived HEVC standards, lending a reason to visit it.

III. CONCLUSION

For the foregoing reasons and based on a review of the record, Petitioner shows by a preponderance of evidence that WD4-v3 anticipates claims 1, 2, 5 and 6 of the '163 patent under 35 U.S.C. § 102(a); and, the combination of WD4-v3, Park, and Zhou renders claims 3 and 4 obvious under 35 U.S.C. § 103(a).

IV. ORDER

For the reasons given, it is

ORDERED that claims 1–6 of the '163 patent are unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude Evidence is *denied*; and

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

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