

**UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C. 20436**

**Before The Honorable MaryJoan McNamara
Administrative Law Judge**

In the Matter of

**CERTAIN VIDEO-CAPABLE LAPTOP,
DESKTOP COMPUTERS, HANDHELD
COMPUTERS, TABLETS, TELEVISIONS,
PROJECTORS, AND COMPONENTS AND
MODULES THEREOF**

Inv. No. 337-TA-1448

RESPONDENTS' PRE-HEARING BRIEF

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I. INTRODUCTION

Complainants Nokia Technologies Oy and Nokia Corporation (“Complainants” or “Nokia”) initiated this investigation, asserting purported standard-essential patents (SEPs) against Respondents Acer Inc. and Acer America Corporation (“Acer”), ASUSTeK Computer, Inc., and ASUS Computer International (collectively, “ASUS”), (collectively “Respondents”).

Respondents have agreed to be bound both by interim license terms declared by the UK Court (including paying the adjustable rate set by the UK Court) and final RAND terms adjudicated by the UK Court. The UK Court’s finding confirms not only that Nokia’s pursuit of injunctive relief in this investigation was improper from the start, but also that no remedy should issue from the Commission in light of Nokia’s failure to grant a license on RAND terms.

Discovery in this investigation has also demonstrated that no remedy should issue because Respondents have not violated Section 337. To support its quasi-standards-based infringement allegations, Nokia resorts to incomplete “testing” of the accused products and rewriting the claims under the guise of claim construction. Under the proper constructions, the evidence is clear that the accused products do not infringe for the many detailed reasons explained herein. The evidence also shows that the claimed technology was well-known to persons skilled in the art prior to the filing of the Asserted Patents, and that the asserted claims are invalid in view of multiple prior art grounds, under any construction of the claims. Respondents’ non-infringement and invalidity positions are thoroughly supported by documentary evidence and the testimony of the technical experts in this investigation, including key admissions of Nokia’s experts.



Respondents have introduced into evidence redesigned accused products that disable the accused functionality and thereby avoid the Asserted Claims. Nokia’s main argument in support of its infringement allegations against these redesigned products is that they are nevertheless “capable” of infringing, despite the fact that (1) the claims as written require a product be “configured to” perform certain steps, not merely be “capable” of performing them after modification, and (2) the accused products would need to be substantially modified to allegedly practice the claimed functionality. As explained herein, Nokia cannot meet its burden of proving that Respondents’ redesigned products infringe.

Nokia’s domestic industry case, which relies on investments in its licensees’ (Microsoft and Samsung) products because Nokia itself does not make or sell any products, fails for several reasons. First, Nokia cannot prove that its licensees’ products practice its patents for the same reasons its infringement allegations fail. Second, Nokia’s economic domestic industry allegations fail because Nokia relies on investments in downstream products that utilize the patented technology rather than the articles alleged to practice the Asserted Patents – chipsets and software (the Android OS) that were designed, developed, and sold by other companies—Intel, AMD, NVIDIA, Qualcomm, MediaTek, and Allwinner for the chipsets, and Google for the Android OS. Recent Commission precedent demonstrates that Microsoft’s and Samsung’s investments in downstream products that happen to utilize the patented technology are not cognizable to satisfy the economic prong. *Certain Active Matrix Organic Light-Emitting Diode Display Panels and Modules for Mobile Devices, and Components Thereof*, Inv. No. 337-TA-1351, Comm’n Op. (Remand) (Apr. 9, 2025). The evidence shows that Nokia has failed to establish the necessary connection between the alleged patent-practicing articles (*i.e.*, the chipsets and software) and its claimed expenditures.

[REDACTED]

The evidence further shows that Nokia has breached its RAND obligations and its duty to negotiate RAND licensing terms in good faith. Instead, Nokia has embarked on a coercive campaign (of which this investigation is but one piece) to extract supra-FRAND royalties for its SEPs. This campaign began with Nokia extracting supra-FRAND royalties from small and vulnerable licensees to build the illusion of an “accepted market rate” that Nokia passes off as a RAND-compliant rate. But these Nokia “program rates” reflect *ex-post* value of the Asserted Patents developed by pressuring potential licensees to accede to Nokia’s demands.

Respondents’ conduct repeatedly affirms that they are willing to accept a license to Nokia’s portfolio on RAND terms. Each Respondent willingly participated in the negotiation discussions and, in fact, have come to agreement with Nokia on most material terms. The parties’ primary disagreement centers around what constitutes a RAND royalty rate. Nokia refused to offer any rate other than its “program rates” but refused to provide Respondents with critical information necessary to assess whether Nokia’s rate offers (*i.e.*, its “program rates”) were RAND (*e.g.*, details of its purportedly “comparable” licenses). In the absence of this critical information, Respondents formulated rate counteroffers based on established methods previously endorsed by the courts *and by Nokia*. Respondents proposed counteroffers formulated using comparable licenses to H.264 and H.265 patent pool portfolios into which each Respondent had entered.

Still unable to reach agreement, Respondents each initiated the above-mentioned rate-setting action in the United Kingdom in which both Respondents have agreed to be bound both by interim license terms declared by the UK Court. The UK Court found that it had jurisdiction to declare the terms of an interim license and set global RAND terms. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Accordingly, Nokia should be estopped from pursuing or obtaining injunctive relief at the Commission based on its discriminatory and inequitable conduct.

Finally, the public interest, which was delegated to the ALJ in this investigation, also weighs heavily against the imposition of remedial orders against Respondents. This Investigation presents overriding public interest considerations with no countervailing benefit to Nokia. Here, the requested relief will have adverse effects on the public health and welfare, competitive conditions, and U.S. consumers. Any marginal interest in enforcing Nokia's patents is far outweighed by the significant harm that an exclusion order would inflict on the public interest.

This Investigation presents unusually strong public interest considerations because Nokia seeks exclusionary relief on patents it contends are SEPs subject to RAND obligations. Allowing Nokia to secure remedial orders on patents it asserts to be SEPs would undermine the entire scheme that permits the creation of industry standards and would hurt U.S. industry. Government agencies and courts have made clear that injunctive relief based on RAND-encumbered patents undermines the public interest by reducing investment in standard-compliant products, raising prices, reducing choice, and decreasing investment into technology complementing these standards.

Nokia's requested relief in this Investigation regarding RAND-encumbered SEPs would negatively impact consumer welfare, denying the advantages of greater competition and innovation associated with industry standards backed by enforceable RAND obligations. Respondents possess significant shares of the desktop and notebook computer market segments in the United States, including in the gaming, education, business and everyday use segments. U.S. consumers would be harmed if deprived of these popular and necessary products at the volumes implicated. the unavailability of alternative products to fill any shortage left by exclusion of Respondents' products would negatively impact the public interest.



As explained herein, remedial orders would prevent the importation of a large breadth of leading products with important uses by customers. Nokia, its domestic industry licensees, or any other participants do not have the ability to meet U.S. demand for the Accused Products. U.S. market segments would be implicated leading to shortages of products that would lead to reduced competition, increased price, reduced consumer choices, and deprive U.S. consumers access to features and products available.

For the reasons set forth herein, Respondents respectfully submit that the evidence of record and the evidence to be developed at the evidentiary hearing compel a finding of no violation of Section 337. The evidence further dictates against the imposition of any remedy in the event a violation is found.

A. Procedural History

1. Complaint and Institution

On April 11, 2025, Nokia filed the Complaint in this case. *See* Compl. April 7, 2025, Nokia filed lawsuits against Acer and ASUS in the Western District of Texas and the Central District of California, respectively, which have been stayed through the resolution of this Investigation. This Investigation was instituted on May 19, 2025. EDIS Doc ID No. 851695. The evidentiary hearing is set to start on March 4, 2026 with the FID due on August 14, 2026, and a Target Date of December 14, 2026.

2. Motion for Summary Determination

On January 2, 2026, ASUS filed a motion for summary determination (Mot. No. 1448-022) that ASUS does not infringe either the '321 or the '267 patent under one of Nokia's infringement theories—namely, Nokia's theory of infringement (applying only to the '321 and '267 patents) based on the Accused Products' alleged support of the AV1 Specification for video coding/decoding. As explained in that motion, there is no genuine dispute of material fact that the



ASUS Accused Products, as sold and without modification, do *not* support the AV1 Specification. Therefore, ASUS does not infringe under an AV1-based theory. ASUS’s motion remains pending as of the filing of this brief.

B. The Parties

1. Nokia

Nokia Technologies Oy and Nokia Corporation are Finnish companies. Nokia has become a non-practicing entity with no relevant U.S. presence, domestic industry, products practicing the patents it asserts, or products competing with those it seeks to exclude. Indeed, Nokia relies on its licensees, Samsung and Microsoft, for the alleged domestic industry. Nokia seeks to leverage the threat of an exclusion order to coerce supra-RAND royalties from Respondents, who are and have been willing licensees on RAND terms.

2. Acer

a) Acer Inc.

Acer Inc. is a Taiwan-based company headquartered in New Taipei City, Taiwan with a presence in more than 160 countries. RX-0831; RX-0805. Acer conducts research, design, marketing, sales, and support of technology products, solutions, and services for Acer’s product offerings which includes laptops, desktops, monitors, projectors, connectivity devices, tablets, gaming products, and more. RX-0831; RX-0847.

b) Acer America Corporation

Acer America Corporation (“Acer America”) is a subsidiary of Acer Inc., and is headquartered in Santa Clara, California. RX-0805; RX-0806.

3. ASUS

a) ASUSTeK Computer Inc.



ASUSTeK Computer Inc. is a corporation organized and existing under the law of Taiwan, with its principal place of business at No. 15, Li-Te Road, Beitou District, Taipei 112, Taiwan. ASUSTeK Computer Inc. is the parent corporation of ASUS Computer International.

b) ASUS Computer International

ASUS Computer International is a corporation organized and existing under the laws of the state of California, with its principal place of business at 48720 Kato Road, Fremont, California 94538. ASUS Computer International is a subsidiary of ASUSTeK Computer Inc.

C. Overview of the Technology

At a high level, the Asserted Patents relate to video compression. Video is a sequence of images intended for display at a regular time interval representing a scene or scenes in space and time and providing the illusion of motion when viewed sequentially. *Digital video* is the term used for a video in which the frames are all digital images comprising pixels. Digital video is not a simple digitization of an analog video signal. The temporal resolution (*i.e.*, frame rate, in frames/second) and spatial resolution (*i.e.*, frame size, or width x height, in pixels) of digital cameras and digital video recorders produce file sizes (if stored) and bandwidths required (if transmitted) that exceed the capabilities of practical and/or feasible systems unless the digital video is compressed.

The Asserted Patents are directed to video compression techniques. Since the early 1990s, major video coding standards such as MPEG-1, MPEG-2, MPEG-4 Visual, H.261, H.263, H.264, H.265, and AV1 have applied essentially the same coding model, and known as so-called hybrid video coders. Hybrid coders exploit similarities between frames through a technique called motion estimation and compensation, and they exploit similarities within frames (*i.e.*, between pixels) through a technique known as transform coding. Data compression, or simply compression, reduces the number of bits (*i.e.*, the size of the file) required to represent the digital video. Specific

[REDACTED]

compression techniques, as relevant to the prior art and the Asserted Patents, are discussed below in additional detail.

D. The Patents at Issue

1. U.S. Patent No. 8,050,321

Complainants assert claims 8 and 10 of U.S. Patent No. 8,050,321 (the “’321 Patent”). The ’321 Patent generally relates to techniques for encoding and decoding video sequences composed of multiple image frames. JX-0012 (’321 Pat.) Abstract. The patent describes a problem where “playback of a streaming file [starts] from a random point” resulting in “discontinuity [] in the image numbering,” which “[t]he decoder interprets this as unintentional loss of image frames and unnecessarily tries to reconstruct the image frames suspected as lost.” *Id.* at 11:13-25. To help address this problem, the patent suggests that “the decoder preferably sets the identifier of the first image frame, preferably an I-frame, of the independently decodable sub-sequence at zero.” *Id.* at 11:37-40. The ’321 Patent explains that an independently decodable GOP, which is defined as a group of pictures that can be decoded without relying on information outside of the group. *Id.* at 11:26-30.

2. U.S. Patent No. 9,036,701

Complainants assert claims 1, 6, 8, and 13 of U.S. Patent No. 9,036,701 (the “’701 patent”). The ’701 patent aims to “enable the provision of efficient processing in the area of video coding and decoding by employing complexity balance entropy coding in order to provide a high level of capability with respect to video coding and decoding in a cost effective manner.” JX-0001 at Abstract. The ’701 patent discloses “categorizing a plurality of syntax elements of video content into first and second categories based on a frequency of occurrence of the syntax elements in the video content.” *Id.* “[T]hose symbols that are expected to occur more frequently than the threshold frequency may be determined to be in the second category while those symbols that are expected

[REDACTED]

to occur less frequently than the threshold frequency may be determined to be in the first category.” *Id.* at 9:51-10:3. The first and second categories of syntax elements are then entropy coded, where the first category of syntax elements “have been subjected to a context update” and the second category of syntax elements “that have bypassed context updating.” *Id.* at Abstract.

3. U.S. Patent No. 10,536,714

Complainants assert claims 1, 9, 15, and 23 of U.S. Patent No. 10,536,714 (the “’714 patent”). The ’714 patent is generally directed to video encoding and decoding techniques for comparing spatial motion vector prediction candidates. The ’714 patent purports to reduce the number of candidates in the motion vector prediction candidate list “by performing a limited number of motion information comparisons between candidate pairs to remove redundant candidates rather than comparing every available candidate pair. JX-0004 (’714 Pat.) 4:18-27.

4. U.S. Patent No. 11,805,267

Complainants assert claims 2, 8, 20, and 16 of U.S. Patent No. 11,805,267 (the “’267 patent”). The ’267 patent relates to bi-directional prediction (JX-0007 (’267 patent) at Abstract), in which a block of pixels is predicted based on two predictions that are combined to form a final prediction. 8-15-2015 Joint Technology Stipulation at 6; ’267 patent at 2:43-45. Nokia did not invent bi-directional prediction, which was known in the art for decades. The purported invention of the ’267 patent aims to “keep the motion compensated prediction signal of each one of the predictions at highest precision possible” and then perform “rounding to the bit-depth range of the video signal after both prediction signals are added.” ’267 patent at 6:53-57.

E. The Products at Issue

1. The Domestic Industry Products

Nokia generally alleges that the Domestic Industry Products are Microsoft and Samsung products such as notebook computers, tablets, smartphones, and gaming consoles that decode



H.264, H.265, and/or AV1-compliant video into a playable video format. Nokia generally points to the “central processing units (CPUs) with integrated graphics processing units (GPUs), and/or discrete GPUs” for its infringement analysis of the DI Products. Nokia has identified the Xbox Series S and Xbox Series X, as well as various Microsoft Surface products as the Microsoft DI products. Nokia has identified certain Samsung Galaxy A, S, Z Flip, and Z Fold products as the Samsung DI Products. Nokia alleged that the DI products contain chipsets from AMD, Intel, NVIDIA, and/or Qualcomm, and that the Samsung DI products also implement Android source code. However, Nokia has not provided any analysis showing that each of the specific Microsoft DI Products actually encode and decode using one or more of H.264, H.265, and AV1. Moreover, while Nokia performed testing on certain products, it only tested 3 of 20+ Microsoft DI products and 3 of 30+ Samsung DI products.

Nokia also contends that AMD and Qualcomm have created custom chipsets for certain Microsoft DI products. Similarly, Nokia contends that Qualcomm created custom chipsets for certain Samsung DI products, and that the Android software on the Samsung DI products is customized. However, Nokia cannot identify any relevant differences between the allegedly custom chipsets and the chipsets or source code that is publicly available for purchase from the same manufacturers. *See, e.g.,* RX-2414. Indeed, Nokia’s infringement analysis for each of the allegedly custom chipsets or source code relies on the non-customized chipsets and source code and asserts that there is no material difference between the two.

2. The Accused Products

Generally, Nokia alleges that the Accused Products are devices such as video-capable laptops, desktop computers, handheld computers, tablets, televisions, and components and modules thereof that decode H.264, H.265, and/or AV1-compliant video into a playable video

[REDACTED]

format. Nokia has pointed to hardware acceleration within the CPUs and/or GPUs found in the Accused Products for purposes of infringement.

a) Acer Accused Products

The Acer Accused Products include thousands of different computers or tablets that have a CPU with an integrated and/or separate GPU. RX-2412. The CPUs in the Acer Products are made by one of the following vendors: [REDACTED]

[REDACTED] *Id.* The separate GPUs in the Acer Accused Products are made by [REDACTED]. While Nokia has provided certain discussion of AMD, Intel, MediaTek, Qualcomm, and NVIDIA source code, Nokia has not provided any analysis of Allwinner source code whatsoever. Moreover, in conducting its infringement analysis Nokia tested only 8 products from a list of Acer Accused Products that is 40 pages long, and failed to perform any representative analysis with respect to the non-tested products.

b) ASUS Accused Products

The ASUS Accused Products also include thousands of different computers or tablets that have a CPU with an integrated and/or separate GPU. RX-2412. While Nokia has provided certain discussion of AMD, Intel, MediaTek, Qualcomm, and NVIDIA source code, Nokia has not provided any analysis of any [REDACTED] whatsoever. Moreover, in conducting its infringement analysis Nokia tested only 10 products from a list of Acer Accused Products that is 374 pages long, and failed to perform any representative analysis with respect to the non-tested products.

II. STATUTORY AUTHORITY AND IMPORTATION

Respondents do not dispute that the Commission has statutory authority over the Accused Products in this Investigation. *Certain Light-Based Physiological Measurement Devices and Components Thereof*, Inv. No. 337-TA-1276, Comm'n Op. at 15 (Nov. 14, 2023). [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

III. EVIDENCE OF DIRECT AND INDIRECT INFRINGEMENT

A. Direct Infringement

In addition to Respondents' non-infringement positions addressed below, the evidence will also support a finding that Respondents do not directly infringe the asserted method claims of each of the Asserted Patents because Nokia cannot identify any specific instances in which Respondents themselves practice each and every step of the asserted method claims in the United States. While Nokia has alleged that Respondents directly infringe the method claims of the Asserted Patents by testing their products, Nokia cannot explain what tests are performed, what parts of functionality of the Accused Products are being tested, or how such testing is relevant to the claims of the Asserted Patents.

Indeed, Nokia's alleged testing evidence cannot show infringement. With respect to the Acer Respondents, [REDACTED]

[REDACTED] at 21:8-21, 22:20-23:16. With respect to ASUS Respondents, [REDACTED]

[REDACTED] Moreover, as the evidence will show, *even if* ASUS employees used videoconferencing tools capable of encoding and decoding H.265 or AV1 video, Nokia has not cited any evidence to show that any ASUS employee has ever used H.265 or AV1 video encoding/decoding during videoconferencing, much less hardware acceleration for those formats. Indeed, Dr. Schonfeld will explain that popular video conferencing technologies, such as Zoom and WebEx, do not make use of H.265 and AV1.

[REDACTED]

Moreover, ASUS filed a motion for summary determination (Mot. No. 1448-022) that the ASUS products do not infringe either the '321 or the '267 patent under one of Nokia's infringement theories—namely, Nokia's theory of infringement (applying only to the '321 and '267 patents) based on the Accused Products' alleged support of the AV1 Specification for video coding/decoding. Specifically, the Accused ASUS Products do not include “computer program code configured to” encode or decode AV1. '321 Patent, 10:13–16 (cl. 10); '267 patent, 21:61–64 (cl. 7, on which cl. 8 depends), 24:6–9 (cl. 25, on which cl. 26 depends). [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] As such, the Accused ASUS Products also cannot satisfy the asserted method claims. The remaining disputes appear to be whether the claims can be satisfied by mere capability or requires that the products be “adapted to” perform the accused functionality—perform hardware accelerated encoding or decoding of AV1. The Federal Circuit, however, has repeatedly found that “configured to” to be akin to “made to,” “designed to,” or “adapted to” rather than “capable of.” *In re Man Mach. Interface Techs. LLC*, 822 F.3d 1282, 1286 (Fed. Cir. 2016) (“We have noted that the phrase ‘adapted to’ generally means ‘made to,’ ‘designed to,’ or ‘configured to,’ though it can also be used more broadly to mean ‘capable of’ or ‘suitable for.’”); *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012) (distinguishing between “configured to” and “having the capacity to,” and between “configured to” and “capable of”). Further, contrary to Nokia's arguments otherwise, the installation of additional CODEC software after the product has taken out of the box, is a modification because the required installation is actually the addition of computer program code. Thus, the need for

[REDACTED]

additional CODEC software demonstrates the ASUS products do not have “computer program code configured to” encode or decode AV1.

B. Indirect Infringement

Nokia has failed to establish that Respondents indirectly infringe the asserted claims. Nokia’s assertion that Respondents indirectly infringe the claims by “inducing their customers to use the Accused Products in a manner that practices the Asserted Claims” is not supported by the evidence. With respect to the Acer Respondents, Nokia merely cites to general webpages which do not provide instructions to customers on how to encode or decode video. With respect to ASUS Respondents, none of the documentation cited by Nokia instructs customers on how to use the Accused Products in an infringing manner. The evidence will show that the cited documentation does not instruct or encourage customers to encode or decode video or was created and published by third parties—including parties outside the United States. *See, e.g.*, RX-2242 RX-2244. Given the complete lack of evidence of any instruction by Acer or Asus to customers related to the methods set forth in the asserted method claims, Nokia cannot prove indirect infringement.

[REDACTED]

[REDACTED] Similarly, to the extent Nokia relies on the posting of videos on YouTube as alleged inducement, Dr. Schonfeld will explain that YouTube determines which format it provides the user—and that neither Acer nor ASUS encourage customers to use H.264, H.265, or AV1 video.

Thus, Nokia cannot establish indirect infringement by any Respondent.

IV. U.S. PATENT NO. 8,051,321

Nokia has asserted claims 8 and 10 of the ’321 Patent. As set forth below, Respondents do not infringe claims 8 and 10 under any proper claim construction, and claims 8 and 10 are invalid regardless of which claim construction positions are adopted.

A. Claim Construction

As set forth in the parties' Joint Post-*Markman* Hearing Claim Construction Chart, the parties dispute the constructions of two terms of the '321 Patent, both of which have been briefed and were argued at the January 14, 2026 *Markman* Hearing. The disputed terms and constructions are set forth below.

Claim Term	Nokia's Proposed Construction	Respondents' Proposed Construction	Staff's Proposed Construction
"the identifier value"	Plain and ordinary meaning, which means an identifier value associated with the indicated first image frame of the independent sequence.	one of the decoded identifier values	An identifier value associated with the indicated first image frame of the independent sequence
"reset/resetting"	Plain and ordinary meaning, which means set[ting] the identifier value for the first time or set[ting] the identifier value again to restart the numbering scheme.	Set[ting] the identifier value again	Plain and ordinary meaning, which means set[ting] the identifier value for the first time or set[ting] the identifier value again to restart the numbering scheme.

In each case, Nokia and Staff's constructions seek to rewrite the express claim language—either by removing the “the” in “the identifier value” and replacing it with “an,” or by removing the “re-” in reset[ting]. Respondents' proposed constructions should be adopted because they give meaning to the patentee's selected claim terms and are consistent with the intrinsic and extrinsic evidence and the relevant case law.

With respect to “the identifier value,” Respondents' proposed construction applies the law of antecedent basis. Here, the immediately preceding limitation in the claim recites “decoding identifier values for image frames.” JX-0010 at cl. 8, 10. Thus, the term “*the* identifier value [for the indicated first image frame]” necessarily refers to one of the decoded identifier values. *See Harris Corp. v. Fed. Exp. Corp.*, 502 Fed. Appx. 957, 963 (Fed. Cir. 2013) (emphasis added); *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1356 (Fed. Cir. 1999) (holding that “the discharge rate” refers back to the earlier recitation of “a discharge rate”); *SIMO Holdings Inc. v. Hong Kong uCloudlink Network Tech. Ltd.*, 983 F.3d 1367, 1375 (Fed. Cir. 2021).



At the *Markman* hearing, Nokia argued that the use of “the” does not require antecedent basis. But that misstates the law—the use of “the” does not require an *explicit* antecedent basis, but if not explicit, the antecedent basis must be inherent. *See* CDXM-0078, -0079 (“[I]nherent components of elements have antecedent basis in the recitation of the elements themselves.”). Here, there is no “inherent” antecedent basis because an image frame does not inherently include an identifier value—it can have no identifier value or multiple different identifier values. As such, the only possible antecedent basis is the one expressly provided in the claims. Moreover, Nokia cites no case law in which an express antecedent basis is provided in a claim, but the later use of “the” does not refer to that express antecedent basis. As such, Respondents’ proposed construction of “the identifier value” should be adopted.

With respect to “reset[ting],” Nokia and Staff’s proposed constructions read out the “re-” prefix, and argue that “resetting” can include “setting for the first time.” Again, Respondents’ proposed construction, in which “resetting” means “setting again,” applies the patentee’s actual choice of words and should be adopted.

First, Respondents’ proposed construction of “resetting” is consistent with the claim language, despite Staff’s arguments otherwise. Under the proposed claim language, the “identifier value” is “set for the first time” in the prior limitation, when it is “decoded.” Thus, “resetting” means setting the identifier value *again*, not for the first time.

Second, Respondents’ proposed construction is consistent with the use of “resetting” in the specification. Both Nokia and Staff argue that the specification uses “set” and “reset” interchangeably. But this is not true. Outside of the claims, the specification uses the word “reset” only a single time:

According to an embodiment, identifier values for pictures are encoded according to a numbering scheme, and the identifier value for the indicated first picture of an independent sequence is reset, preferably to zero.

JX-0010 at 4:42-45. This usage is consistent with Respondents’ proposed construction—where the identifier value is first set, when it is “encoded” into the bitstream, only after which it is “reset.” *Id.* While the specification describes “setting” an identifier value to zero at other points—including situations where the identifier value has not previously been set (*see, e.g., id.* at 11:26-40)—the patentee *specifically chose* to claim “resetting” not “setting.” Respondents’ proposed construction gives meaning to this word choice, while Nokia and Staff’s proposed constructions ignore it.

Finally, Nokia has relied heavily on the definition of “reset” from *The Merriam-Webster Dictionary*, in support of its arguments. *See* CXM-0002. But Nokia misunderstands the definition provided—which defines “reset” as “to set again or anew.” *Id.* Nokia argues that “to set . . . anew” has a different meaning than “to set again,” which is consistent with Nokia’s proposed language “setting for the first time.” Indeed, Nokia even argued that a dictionary would not provide a definition in which “again” and “anew” were synonymous and provided the same meaning. Nokia is simply wrong. *Merriam-Webster’s* definition of “anew” is “for an additional time; again.” *See* <https://www.merriam-webster.com/dictionary/anew>. Accordingly, the extrinsic evidence supports Respondent’s proposed construction, which should be adopted.

B. Infringement

As discussed below, Complainants failed to prove infringement of the ’321 Patent.

1. Nokia’s Citations to Standards and Testing Evidence Do Not Demonstrate Infringement

a) Limitations 8[a]/10[a] - Decoding an Indication of the First Frame of an Independent Sequence



It has been Nokia's position for purposes of validity that an "indication of at least one image frame" cannot be data or information within the header of a GOP or coded video sequence (i.e., a `closed_gop_flag` in MPEG-1 and MPEG-2). Nokia asserts that such information within the header of a GOP or video sequence (i.e., a `closed_gop_flag`) is instead an indication of a GOP because it is found in a GOP header. Data or information within a header of a GOP (i.e., a `closed_gop_flag`) can represent an "indication of at least one image frame" since the GOP header always and only comes before the very first picture in a GOP, and a GOP is required to have at least one frame. However, to the extent Nokia's view is adopted, then Dr. Chrissan has not identified anything that constitutes an "indication of at least one image frame."

For H.265, Dr. Chrissan identifies "`nal_unit_type` values 19 (`IDR_W_RADL`) and 20 (`IDR_N_LP`)" as the indication of at least one image, which is the first image frame in decoding order. However, when a NAL unit has a NAL unit type of 19 or 20, the NAL unit is a coded slice segment of an IDR picture, and a slice segment is not an image frame. H.265 defines a slice segment as "[a]n integer number of CTUs ordered consecutively in the tile scan and contained in a single NAL unit." JX-0137 (H.265) at 11. H.265 describes the relationships of these terms as "Pictures are divided into slices and tiles. A slice is a sequence of one or more slice segments starting with an independent slice segment and containing all subsequent dependent slice segments (if any) that precede the next independent slice segment (if any) within the same picture. A slice segment is a sequence of CTUs. Likewise, a tile is a sequence of CTUs." JX-0137 (H.265) at 23. Thus, `nal_unit_type` = 19 or 20 is not an indication of an "image frame."

For AV1, Dr. Chrissan identifies a key frame as "the first coded frame of a new sequence and is signaled unambiguously by `show_existing_frame` = 0 with `frame_type` = `KEY_FRAME` in the frame header." However, the AV1 Specification states that "a bitstream received in a streaming

use case may never contain key frames, but instead rely on gradual intra refresh.” JX-0138 (AV1 Specification) at 205. The AV1 Specification thus indicates that decoding of such an encoded bitstream is supported by the decoder specification.

b) Limitations 8[b]/10[b] - Starting the Decoding of the Video Sequence from the First Frame

The claim language requires “starting the decoding of *the video sequence*” from said first frame of the “**independent sequence**” and decoding from *the video sequence* an indication of the first image frame of **the independent sequence**. However, as noted in the H.264, H.265, and AV1 standards, there are typically multiple “independent sequences” (which Nokia and Dr. Chrissan allege correspond to a coded video sequence starting with an IDR picture under H.264, a CVS starting with an IRAP picture (e.g., IDR picture) under H.265, and a sequence starting with a key frame under AV1) in each video sequence, wherein each independent sequence has its own “first image frame.” *See, e.g.*, JX-0136 (H.264) at 5, JX-0137 (H.265) at 5, and JX-0138 (AV1) at 204 (defining a bitstream as comprising one or more coded video sequences).

Therefore, for all “independent sequences” in a video sequence, the Accused Products do not start “the decoding of the video sequence” from “said first image frame of the independent sequence.” For example, header information before the very first image frame of any sequence provides information necessary to decode the frame, such as the bit depth, for each of the standards (bit depth in H.264 and H.265, and a sequence profile that indicates the bit depth in AV1). However, under Nokia’s interpretation of the claim limitation for purposes of validity, the decoding of data or information in H.264, H.265, and AV1 before decoding the first frame means that this limitation is not satisfied. Therefore, Dr. Chrissan has not shown that any product let alone an Accused Product starts “the decoding of *the video sequence*” from the first image frame. Thus,

[REDACTED]

the Accused Products do not “start the decoding of the video sequence” from “said first image frame of the independent sequence.”

c) Limitations 8[c]/10[c] - Decoding Identifier Values

The claims require “decoding identifier values for image frames according to a numbering scheme.” The evidence will show that there are no identifier values that are both decoded and reset (as required by the next limitation). First, it is unclear which variables or parameters Dr. Chrissan has identified as the “identifier values for image frames” that are decoded pursuant to the claim language. Second, the same “identifier values” are required by the “decoding” and “resetting” elements of the claim. However, Dr. Chrissan does not make clear which identifier values meet these respective limitations, and in some cases identifies different identifier values for each limitation.

For the decoding limitation, Dr. Chrissan identifies only a few variables or parameters in his analysis. For H.264, Dr. Chrissan identifies “pic_order_cnt_lsb” and “frame_num” in the slice header syntax. For H.265, Dr. Chrissan identifies “a variable defined as picture order count (POC)” and “POC value.” For AV1, Dr. Chrissan identifies “order_hint”, “display_frame_id,” “current_frame_id,” “OrderHint,” “OrderHints,” and “ref_order_hint”, and “RefFrameId”.

None of these alleged identifier values satisfies the claim limitations. The alleged “identifier values” are either not decoded because they are derived/calculated, and are not part of the bitstream received by the decoder, and/or these alleged identifier values are never reset by the decoder, which is required by the following claim element.

With respect to **H.264**, pic_order_cnt_lsb and frame_num are values decoded from the bitstream and as such they have been set by the encoder. Thus, these alleged “identifier values for image frames” of the independent sequence are not “reset” by the decoder as required by the next limitation.



Similarly, with respect to **H.265**, the terms “picture order count” and “picture order count value” are used in the H.265 standard as English descriptions. H.265 has a decoder variable called `PicOrderCntVal` which it describes as “the picture order count of the current picture,” which Dr. Chrissan later identifies for the “resetting” claim. Dr. Chrissan himself states that “each of the Accused Products derives `PicOrderCntVal` that indicates the picture order count of the current picture.” The alleged identifier variable `PicOrderCntVal` is not present in the bitstream received by the decoder, and as such is not decoded but is instead calculated or derived.

For **AV1**, `order_hint`, `display_frame_id`, and `current_frame_id` are all decoded from the bitstream if enabled, and hence are values set by the encoder if they are used at all. `ref_order_hint` is an 8-element array that is also decoded from the bitstream if enabled, and hence contains values set by the encoder if it is used at all. `order_hint` must be enabled via the sequence-level parameter `enable_order_hint` (also set by the encoder, included in the bitstream, and decoded). `display_frame_id` and `current_frame_id` must be enabled via the sequence-level parameter `frame_id_numbers_present_flag`. However, none of these AV1 variables are required by the decoding process. The AV1 specification states “The frame id numbers (represented in `display_frame_id`, `current_frame_id`, and `RefFrameId[ i ]`) are not needed by the decoding process, but allow decoders to spot when frames have been missed and take an appropriate action.” JX-0138 (AV1) at 115. It also states “There is no requirement that `OrderHint` should reflect the true output order. As a guideline, the motion vector prediction is expected to be more accurate if the true output order is used for frames that will be shown later. If a frame is never to be shown (e.g. it has been constructed as an average of several frames for reference purposes), the encoder is free to choose whichever value of `OrderHint` will give the best compression.” *Id.* at 152.



Furthermore, for AV1, the values for OrderHint, OrderHints (a 7-element array), or RefFrameId (an 8-element array) are not decoded but are instead calculated or derived from other information in the stream, if the enable_order_hint flag has been set. RefFrameId is an 8-element array that is derived at the decoder from other information and is only used if enabled by the frame_id_numbers_present_flag.

As discussed previously, none of the variables or parameters that Dr. Chrissan identified as the “identifier values” satisfy any of the claims for at least these reasons, which are shown in Table (8[c]/10[c]). R-APPX at 1-2.

d) Limitations 8[d]/10[d] - Resetting the Identifier Value of the First Frame

The claims recite “resetting the identifier value for the indicated first image frame of the independent sequence.” The evidence will show that there is no “identifier value” that is both decoded and reset. The claim requires that “the identifier value of the first frame” is reset. The prior limitation requires “decoding identifier values for images frames.” Thus, as discussed previously, at least the same “identifier value of the first frame” is required to be decoded and reset. However, Dr. Chrissan does not make clear which identifier values meet these respective limitations, and in some cases identifies different identifier values for each limitation. Dr. Chrissan has not identified any alleged “identifier values” that satisfy the “decoding” and “resetting” elements of the claim.

For the resetting limitation, Dr. Chrissan identifies only a few variables or parameters in his analysis. For H.264, Dr. Chrissan identifies prevPicOrderCntMsb and prevPicOrderCntLsb and frame_num. For H.265, Dr. Chrissan states that “each of the Accused Products derives PicOrderCntVal that indicates the picture order count of the current picture.” For AV1, Dr. Chrissan identifies a “Key Frame” and Order Hint.



None of the alleged identifier values satisfy the claim language. As an initial point, in H.264, prevPicOrderCntMsb and prevPicOrderCntLsb are not identifier values for the first frame of the independent sequence – they specifically refer to the frame before the first frame. Because the claims are directed to the decoder performing the claimed functionality, the encoder performing the claimed functionality does not satisfy the claims. Thus, to the extent that the associated parameter is set to zero by the encoder and provided as zero to the Accused Products as part of the bitstream, the Accused Products do not “reset[] the identifier value.” This is true for at least (1) pic_order_cnt_lsb and frame_num for the H.264 standard, and (2) order_hint, display_frame_id, current_frame_id, and ref_order_hint for the AV1 specification. To the extent Dr. Chrissan contends that Key Frames represent identifier values or the resetting of identifier values, Dr. Chrissan ignores that Key Frames are set by the encoder.

Further, to the extent that the decoder simply sets an identifier value to zero for a “first image frame” without first decoding the identifier value for that frame, the decoder has not “reset” the identifier value, it has “set” the purported identifier value in the first instance. This is the case for at least (1) prevPicOrderCntMsb and prevPicOrderCntLsb for the H.264 standard, (2) “picture order count (POC)” or PicOrderCntVal for the H.265 standard, and (3) OrderHints for the AV1 Specification. Furthermore, to the extent that the decoder simply sets an identifier value to zero for a “first image frame” for any of the alleged identifier values, the decoder has not “reset[] the identifier value for the indicated first image frame of the independent sequence” as required by the claims. Thus, none of the variables or parameters that Dr. Chrissan identified as the alleged “identifier values” satisfy any of the claims for at least these reasons, which are shown in Table (8[d]/10[d]). R-APPX at 2.

2. Nokia’s Source Code Analysis Does Not Demonstrate Infringement

[REDACTED]

In addition to relying on the various standards and testing evidence, as discussed above, Nokia's expert, Dr. Chrissan, nominally relied on source code for his infringement analysis. Specifically, for the Acer, ASUS, and DI products, Dr. Chrissan cited source code from several chipmakers—namely, AMD, Intel, NVIDIA, and Qualcomm. Dr. Chrissan also cited source code from MediaTek for the Acer and ASUS products, and open-source Android source code for the DI products. Dr. Chrissan's source code analysis fails.

As Dr. Hemami will explain, a thorough and complete source code analysis is necessary to evaluate whether any of the Accused Products or Domestic Industry Products infringe or practice any of the Asserted Claims. Indeed, a decoder can implement an H.264, H.265, or AV1 decoding process in various ways—including without infringing or practicing the Asserted Claims. *See* RX-0232 at 3.132; RX-0231 at 3.145; RX-2226 at 7.2. Since an Accused Product need not follow the exact process described in the standard, Nokia must demonstrate that the specific implementation of each product infringes the claims. It has not. Specifically, Dr. Chrissan failed to present any claim by claim, much less an element-by-element, analysis that compares the source code present in the Accused Products and Domestic Industry Products to each element of each Asserted Claims. He fails to match any of the source code he identifies to any claim limitation, thus failing to demonstrate infringement. He also fails to show that any of the source code he cites is ever executed on any of the relevant products.

Indeed, Dr. Chrissan fails to demonstrate that the source code he cites is even included on any of the Accused Products—or if it is, which of the Accused Products include such source code. Both the Acer and ASUS accused products include many different CPUs and GPUs, but Dr. Chrissan has failed to demonstrate which source code is found on which chip. In fact, with respect to the DI products, Dr. Chrissan argues that certain chipsets or software [REDACTED]

[REDACTED]

[REDACTED] were “customized” for those products. Yet, he analyzes the same source code for both “customized” and non-customized products. Moreover, with respect to the ’321 source code, Dr. Chrissan points only to software or firmware source code—despite the fact that he is relying on hardware accelerated decoding for infringement. This software and firmware source code cannot support his infringement analysis, which would have required analysis of Verilog, RTL, or other hardware description languages.

In addition to these general reasons, Nokia’s source code analysis with respect to the ’321 Patent fails to show that numerous of the claim limitations are met. R-APPX at 3-7.

C. Technical Domestic Industry

Nokia’s allegations and evidence regarding why the technical prong of the domestic industry requirement are practiced by the DI products are identical to its infringement allegations. Indeed, Nokia relies on the same parts of the H.264, H.265, and AV1 standards, and analyzes the same source code from some of the same chip makers. Specifically, for the DI products, Nokia references source code from [REDACTED]. Thus, Nokia has failed to meet the technical prong of the domestic industry requirement for the same reasons as set forth above with respect to infringement.

Moreover, Nokia has failed to analyze which DI products actually decode or encode video according to which standard (e.g., H.264, H.265, AV1). Nokia has also failed to test or analyze source code for many of the alleged DI products, testing only 3 of 20+ Microsoft DI products, and 3 of 30+ Samsung DI products. Finally, Nokia has failed to analyze how its testing or source code analysis shows that any functionality of the DI products meets the limitations of the Asserted Claims.

D. Invalidity

[REDACTED]

As set forth below, claims 8 and 10 of the '321 Patent are invalid as obvious in view of the prior art. The majority of Respondents' obviousness grounds are based on MPEG-1, either alone or in combination with other references. During the 1380 Investigation, ALJ Elliot found that each limitation of claims 8 and 10 was literally disclosed in MPEG-1 except for limitations [8e]/[10e] (the resetting limitation). RX-0466 (337-TA-1380 Initial Determination) at 49-56. Specifically, ALJ Elliot noted that in MPEG-1, it was the encoder that reset the identifier value, and that "there is no . . . disclosure of a *decoder* performing the [resetting] activity." *Id.* at 54. And while Respondents nominally argued that having the decoder perform the reset would have been obvious, ALJ Elliot noted that the obviousness testimony was "conclusory" and dismissed it without analysis. *Id.* at 56. Here, Respondents have provided detailed, clear, and convincing evidence demonstrating why it would have been obvious to modify MPEG-1 either alone, or in view of other references such that the decoder would reset the identifier value—meeting each and every limitation of claims 8 and 10. ALJ Elliot did not have the benefit of this analysis in the 1380 Investigation. And this evidence demonstrates that claims 8 and 10 of the '321 Patent are invalid.

1. Claims 8 and 10 of the '321 Patent Are Obvious in View of MPEG-1 Alone

MPEG-1 was available as a printed publication by at least August 1, 1993 and qualifies as prior art to the '321 Patent under at least pre-AIA 35 U.S.C. § 102(a) and (b). RX-1935. Generally, the MPEG-1 standard consisted of four parts—Systems, Video, Audio, and Compliance Testing—with a later-published fifth part that included software simulation. The relevant portion for the asserted claims is Part 2: Video, which specifies the syntax for a coded video bitstream and the corresponding decoding process. RX-1935 at Section 0.5; *id.* at D.2.1; *id.* at Section 1.1.

MPEG-1 included numerous technical concepts that are relevant to the Asserted Claims, including multiple picture types, decoding versus display order, groups of pictures, and temporal



reference and numbering. Specifically, MPEG-1 describes (i) I-pictures, which are coded without reference to other pictures; (ii) P-pictures, which are coded using motion-compensated prediction from a prior I- or P-picture; and (iii) B-pictures, which are coded using motion-compensated prediction from past and/or future I- or P-pictures. RX-1935 at D.2.3; *id.* at 2.1.121. It also notes that because B-pictures may depend on future reference pictures, the decoding order for the image frames may be different than display order. To keep track of the display order, MPEG-1 assigns each picture a temporal_reference valude that defines display order. The temporal_reference is included in the picture header, decoded from the bitstream, and reset to zero for the first picture in display order of each GOP, incrementing by one for each subsequent picture. RX-1935 at D.5.3.2; *id.* at 2.4.3.4.

MPEG-1 organizes pictures into Groups of Pictures (GOPs), defined as “[a] series of one or more coded pictures intended to assist random access.” RX-1935 at 2.7.71. A GOP is “the smallest coding unit that can be independently decoded within a sequence,” consisting of a header and some number of pictures. *Id.* at D.2.3. MPEG-1 requires that the first coded picture in a GOP is an I-picture, and that the last coded picture in display order is an I-picture or P-picture. RX-1935 at 2.4.1. MPEG-1 further explains that a closed GOP is encoded “without motion vectors pointing to the previous group of pictures” and can be decoded without using decoded pictures from the prior GOP for motion compensation. RX-1935 at 2.4.3.3; *id.* at D.5.2. Because I- and P-pictures cannot depend on reference pictures in subsequent GOPs, and because B-pictures may reference only the nearest adjacent I- or P-pictures in display order, no picture in a closed GOP can depend on pictures outside that GOP for motion-compensated prediction. RX-1935 at D.2.3; *id.* at 2.1.121. MPEG-1 supports random access by instructing the decoder to discard bits until it encounters, among other options, the start of a GOP via a GOP start code. RX-1935 at D.7.1.1.

a) Limitations 8[pre]/10[pre] - The Preamble Limitations

To the extent the preamble is limiting, MPEG-1 expressly discloses “a method for decoding a compressed video sequence.” MPEG-1 specifies the syntax for a coded video bitstream, describes the coded video sequence as a format for compressed digital video, and specifies the decoding process for that bitstream. RX-1935 at Section 0.5; *id.* at D.2.1; *id.* at Section 1.1. Thus, Limitation 8[pre] is met.

With respect to claim 10, MPEG-1 further teaches that the decoding process may be implemented in a decoder. RX-1935 at D.2.4; *see also id.* at 0.4. Moreover, Dr. Hemami will testify that a POSITA at the relevant time would have known of software-based implementations of MPEG-1 decoding, including widely used software decoders. RX-1934; CX-6481. A POSITA therefore would have understood that implementing MPEG-1 decoding necessarily requires at least one processor and at least one memory storing computer program code configured to cause the decoder to decode a compressed video sequence, as recited in limitation 10[pre].

b) Limitations 8[a]/10[a] - Decoding an Indication of the First Frame of an Independent Sequence

As discussed above, MPEG-1’s closed GOPs are independent sequences in which all motion-compensated prediction references remain internal to the GOP. RX-1935 at 2.4.3.3; *id.* at D.5.2. MPEG-1 further teaches “decoding from the video sequence an indication” of the first image frame of such an independent sequence via the closed_gop flag. Dr. Hemami will explain that the closed_gop flag is decoded by the decoder from the GOP header, and when set to 1, indicates that the *next picture in the bitstream* is the first picture of a closed GOP in decoding order. Each GOP always begins with a GOP header containing the closed flag. RX-1935 at D.5.2. MPEG-1 does not permit repeating a GOP header within a GOP, and a GOP always starts with an I-picture in decoding order. *Id.*



Nokia attempts to argue that the closed_gop flag indicates only a GOP, not an image frame. However, as Dr. Hemami will testify, the GOP header *always* immediately precedes the first picture in the GOP. RX-1935 at 2.7.71. And Nokia's expert, Dr. Richardson, has admitted that in an error-free bitstream, the frame immediately following the closed GOP flag will always be the first frame of the closed GOP. Moreover, the '321 Patent itself confirms that indications of image frames may be included in header fields. JX-0010 at 2:34–37; 14:49–52.

In addition, Dr. Hemami will testify, and Nokia will not dispute, that it would have been obvious to implement this functionality in the processor, memory, and computer program code of an MPEG-1 video decoder as described in limitation 10[pre].

Accordingly, MPEG-1 discloses the requirements of limitations 8[a] and 10[a].

c) Limitations 8[b]/10[b] - Starting the Decoding of the Video Sequence from the First Frame

MPEG-1 expressly teaches limitations 8[b] and 10[b]. MPEG-1 teaches beginning decoding at random access points, including the beginning of a closed GOP. RX-1935 at D.7.1.1. When decoding begins at a closed GOP, MPEG-1 teaches that decoding proceeds without using motion-compensated prediction from pictures decoded prior to the first picture of the closed GOP. RX-1935 at 2.4.3.3; *id.* at D.5.2. And while Nokia has suggested that MPEG-1 decodes header information *before* decoding the first frame, such argument is irrelevant and misapplies the claim language. As Dr. Hemami will explain, the '321 Patent expressly contemplates decoding header information to identify the first picture from which decoding begins—which is exactly what is described in MPEG-1. JX-0010 at 4:8–10; 4:25–28; 4:39–41. Again, as discussed above, it would have been obvious to implement this process in a video decoder comprising the processor, memory, and computer program code recited in limitation 10[pre].

Accordingly, MPEG-1 discloses the requirements of limitations 8[b] and 10[b].

d) Limitations 8[c]/10[c] - Decoding Identifier Values

MPEG-1 expressly discloses limitations 8[c] and 10[c]. Specifically, MPEG-1 teaches an identifier value, called `temporal_reference`, that is located directly in the bitstream and is decoded by the decoder for each image frame. *See* RX-1935 at D.5.3.2; *id.* at 2.4.3.4, 2.4.2.5. The `temporal_reference` value is decoded according to a numbering scheme representing the display order of the image frames in a GOP. *Id.* Nokia has not disputed that `temporal_reference` is a decoded identifier value.

e) Limitations 8[d]/10[d] - Resetting the Identifier Value of the First Frame

MPEG-1 expressly teaches that the `temporal_reference` value is reset to zero for the first frame in display order of a GOP, including for each closed GOP. *Id.* at D.5.3.2; see also *id.* at 2.4.3.4 (“For the earliest picture (in display order) in each group of pictures, the temporal-reference is reset to zero.”). While MPEG-1 does not expressly teach that a *decoder* would reset the `temporal_reference` of the first frame in decoding order of a closed GOP to zero, it would have been obvious to a POSITA to create a modified (and more error-resilient) version of MPEG-1. And this obvious modified version of MPEG-1 would have met the requirements of limitations 8[d] and 10[d].

First, as Dr. Hemami will explain, MPEG-1 teaches that there are two different forms for constructing a closed GOP: (1) “omit[ing] any B-pictures preceding the first I-picture” or (2) “allow[ing] such B-pictures, but to code them using only backward motion compensation.” *Id.* at D.5.2. These two forms are shown below, with the form without leading B-pictures described as the “typical example” and the second form describes as “less typical”:

A typical example of a closed group is shown in figure D.18a.

I	B	B	P	B	B	P	B	B	P	B	B	P
0	1	2	3	4	5	6	7	8	9	10	11	12

(a) closed group

B	B	I	B	B	P	B	B	P	B	B	P	B	B	P
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14

(b) open or closed group

Figure D.18 -- Example groups of pictures in display order

A less typical example of a closed group is shown in figure D.18b. In this example, the B-pictures which precede the first I-picture must use backward motion compensation only, i.e. any motion compensation must be based only on picture number 2 in the group.

Id. It would have been obvious to a POSITA to create or implement a modified version of MPEG-1 that only permitted the first form of closed GOPs—the form exemplified by Figure D.18(a). As Dr. Hemami will explain, the second form (D.18(b)), is rarely if ever used, because it is more complex, wastes decoder resources, and is likely to sacrifice compression efficiency. Indeed, when using form D.18(a), an encoder creating a bitstream proceeds logically—encoding the first frame of an independent sequence and using it as the basis for later frames. But with form D.18(b), an encoder would have to skip and buffer the first one or more original frames and choose some later frame to encode first—then returning to encode the skipped frames. Dr. Hemami will explain that such a process is unnecessarily complex, and is not used in practice.

Moreover, since the leading B frames of form (D.18(b)) are unable to rely on multiple reference pictures, they lose compression efficiency. Dr. Hemami provided exemplary calculations demonstrating that the resulting compression efficiency for form D.18(b) is less than that of form D.18(a). *See* R-APPX at 8. Thus, a POSITA would have been motivated to implement this modified version of MPEG-1, for example, in a research setting where a researcher is testing video encoders and decoders and related methods, and Dr. Hemami testified that she in fact did so. In addition, Dr. Hemami will explain that a POSITA would have had a reasonable expectation of success in implementing this modified MPEG-1, because the modification constitutes (i) a minor change, (ii) which does not add functionality or features, but (iii) instead restricts MPEG-1 to one

[REDACTED]

of the already existing and exemplary forms—which MPEG-1 specifically identifies as the “typical example.”

A result of this obvious, modified MPEG-1, is that the first frame in decoding order of each closed GOP is also the first frame in display order, and would necessarily have a temporal_reference of zero. This results in redundant information in the bitstream: both closed_gop set to 1 and temporal_reference set to zero indicate that the first frame of the closed GOP has a temporal reference of zero. A POSITA would have understood that a decoder could use this redundant information for error resilience—namely by having the decoder automatically reset temporal_reference to zero for the first frame following a closed_gop flag set to 1 in the bistream. Dr. Hemami provided two methods that this “resetting,” performed by a decoder, could have been implemented. *See* R-APPX at 9-10. Each of these methods would have been obvious to a POSITA. The first—resetting after decoding temporal_reference—meets the “resetting” limitation under either party’s proposed claim constructions, while the second—resetting instead of decoding temporal_reference—meets the “resetting” limitation under Nokia’s constructions. *See id.* As Dr. Hemami will explain, a POSITA would have been motivated to implement these modifications to provide robustness to errors in the compressed bitstream—such that, even if the bistream provided an inaccurate value of temporal_reference, the decoder would be able to correct the inaccuracy and correctly display the video sequence. Implementing error resilience methods to allow a decoder to correctly display video was known in the art, further demonstrating the obviousness of this modification. *See* RX-1986; RX-1987. And such a modification would have been routine to a POSITA, who would have had a reasonable expectation of success in successfully implementing the modification.

Accordingly, MPEG-1 renders the requirements of limitations 8[d] and 10[d] obvious.



2. Claims 8 and 10 of the '321 Patent Are Obvious in View of MPEG-1 in Combination with Adolph

Respondents' second obviousness ground combines the teachings of MPEG-1 with a second prior art reference, U.S. Patent Publication No. 2001/0048805A1 ("Adolph"). Adolph was filed on June 9, 1998 and published on December 6, 2001, and therefore qualifies as prior art to the '321 Patent under at least pre-AIA 35 U.S.C. §§ 102(a) and (e). RX-1986.

As Dr. Hemami will testify, it would have been obvious to a POSITA to combine the teachings of Adolph with MPEG-1. Adolph expressly references the MPEG-1 and MPEG-2 standards and explains that those standards "provide virtually a hierarchical division of the video data," including the "so-called Group of Pictures (GOP)." RX-1986 at [0002], [0004]–[0005]. Adolph is directed to methods for correctly displaying video sequences even when errors occur in the decoded bitstream, particularly where GOP header information is missing or corrupted. RX-1986 at Abstract. Adolph specifically addresses MPEG-coded video in which pictures of different types (I, P, B) are coded in an order (decoding order) that does not fully correspond to display order. *Id.* Adolph explains that its invention allows correct display even if a GOP header is omitted and temporal reference codes in the bitstream would otherwise signal an incorrect display order. *Id.* at Abstract; [0005].

To solve this problem, Adolph teaches modifying the decoder to apply new identifier values—called an IP counter and a B counter—based on picture types decoded from the bitstream, thereby allowing the decoder to reconstruct correct display order even when GOP header information is missing. RX-1986 at [0030], [0032]. Dr. Hemami will testify that a POSITA would have been motivated to incorporate these teachings into an MPEG-1 decoder and would have had a reasonable expectation of success because Adolph's approach is straightforward and expressly



intended for use with “MPEG-similar” decoders. RX-1986 at [0041]. Indeed, Nokia has not disputed that it would have been obvious for a POSITA to combine MPEG-1 and Adolph.

With respect to limitations 8

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[pre]/10

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[pre]
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, 8[a]/10[a], and 8[b]/10[b], the combination of MPEG-1 and Adolph discloses those limitations for the same reasons as described above with respect to MPEG-1 alone. MPEG-1 and Adolph in combination would use the same closed GOP as an independent sequence, the same closed_gop flag as the indication, and would start decoding at, e.g., the beginning of a closed GOP. See Section IV.D.1.a, b., and c.
```

However, with respect to limitations 8[c]/10[c] and 8[d]/10[d], the combination of MPEG-1 and Adolph discloses an additional identifier value—its IP and/or B counters. RX-1986 at [0030], [0032]. Adolph teaches that picture type information decoded from the bitstream is used to increment an IP counter for I- and P-pictures and a B counter for B-pictures. RX-1986 at [0023], [0030]. These counters follow defined numbering schemes and can be combined (e.g., IP.B) to form unique identifiers for pictures within a GOP. RX-1986 at Fig. 6.

There are two different ways that this combination renders claims 8 and 10 obvious. As described above in in Section IV.A., the parties dispute the construction of “the identifier value,” including whether resetting “the identifier value” requires resetting one of the decoded identifier values, or whether resetting any identifier value associated with the first frame is sufficient. As set forth above, Respondent’s construction—requiring resetting one of the decoded identifier values—should be adopted. In this case, the IP counter value alone, or in combination with the B counter value (e.g., IP.B) is the identifier value required by both limitations 8[c]/10[c] and 8[d]/10[d]. Nokia raises two arguments in response: (i) that the IP and B counter values are not “identifier values,” (ii) that IP and B counter values are not decoded, and (iii) that the IP and B counter values are not reset for the indicated first image frame. Each argument fails.

[REDACTED]

First, Nokia argues that these values are simply counters implemented by the decoder to keep track of image frames, and are not “identifier values.” This argument is nonsensical. The IP counter is an identifier value (according to a numbering scheme) that tracks the decoding order of reference pictures (I and P pictures) in the bitstream. RX-1986 at [0023], [0030], Fig. 6. This IP counter is *identical* to the disclosure in the specification of a *preferred embodiment* of an identifier value:

always starts the numbering from the beginning. The identification of an individual image frame thus requires the layer number, sub-sequence identifier and image frame number to be determined. According to a preferred embodiment of the invention, the image frames can be independently numbered using consecutive numbering in which successive reference image frames in the coding order are indicated with numbers incremented by one. *to require layer numbers and sub-se-*

JX-0010 at 13:22-29. These IP and B counter values are assigned to each image frame in Adolph as an identifier so that the values can be used to reconstruct the correct display order of the video sequence. RX-1986 at [0030], [0032]. Nokia’s argument that these values are not identifier values is without merit and must be rejected.

Second, Nokia suggests that the IP and B counter values are assigned by the decoder, and are not “decoded.” As described above in Section IV.B.1., it is Respondents’ position that “decoding” in the ’321 Patent requires retrieving a value (in binary form) directly from the bitstream. Respondents agree that the IP and B counter values are not “decoded” under that position. However, Nokia’s position is that any value that is calculated or derived by a decoder based on information in the bitstream is “decoded.” And it cannot be disputed that the IP and B counters are calculated from information in the bitstream. Specifically, the IP and B counters are both derived by the decoder based on the picture type of each picture, information that is included directly in the bitstream as part of the MPEG-1 syntax. RX-1935 at 2.4.2.5, 2.4.3.4. Accordingly, the IP and B counter values of Adolph are decoded under Nokia’s understanding of “decoding.”



Third, Nokia argues that because the counters are reset “after” a GOP header is found, they are not reset “for the indicated first image frame.” However, it is undisputed that Adolph teaches resetting both the IP counter and the B counter after a GOP header has been correctly found. RX-1986 at [0030]. And as discussed above, under MPEG-1, each GOP begins with a GOP header, followed immediately by the first picture of the GOP in decoding order, which is always an I-picture. RX-1935 at 2.4.2.4; D.5.2. Thus, when Adolph teaches resetting the counters following the GOP header, the reset necessarily applies to the first image frame of the GOP. As shown in Adolph’s Figure 6, for the first picture of a GOP in decoding order, the IP counter will be one and the B counter will be zero, regardless of whether leading B-pictures are present. RX-1986 at Fig. 6. As Dr. Hemami will testify, this reset behavior—which is expressly performed by the decoder in Adolph—satisfies the claimed “resetting” requirement.

If Nokia’s construction of “the identifier value” is adopted—meaning that the reset identifier value can be any identifier value associated with the first frame—then the combination of MPEG-1 and Adolph additionally discloses (i) decoding temporal_reference (an identifier found directly in the bitstream), and (ii) resetting the IP and B counters of Adolph for the first frame in decoding order.

Thus, under either parties’ proposed constructions, the combination of MPEG-1 and Adolph renders claims 8 and 10 obvious.

3. Claims 8 and 10 of the ’321 Patent Are Obvious in View of MPEG-1 in Combination with Morimatsu

Respondents’ third obviousness ground combines the teachings of MPEG-1 with U.S. Patent No. 6,917,648 (“Morimatsu”). Morimatsu was filed on April 26, 2000, and issued on July 12, 2005, and therefore qualifies as prior art to the ’321 Patent under at least pre-AIA 35 U.S.C. §§ 102(e). RX-1987.



Morimatsu discloses inter-frame and intra-frame coding techniques for compressing and decoding video sequences and is expressly built on conventional video coding technology, including MPEG-1. RX-1987 at 2:46-48; 9:8-12. Morimatsu addresses a known deficiency in conventional video coding systems—namely, the inability to recover gracefully from transmission or storage errors that corrupt the first frame of a video sequence or the first frame following a scene change, and the resulting propagation of errors to subsequent frames. RX-1987 at 2:66-3:34. Morimatsu’s solution improves robustness by detecting scene changes and resetting decoding parameters at appropriate points in a video sequence, while remaining compatible with conventional video coding techniques. RX-1987 at abstract; 16:34-42. Again, given that Morimatsu expressly discusses implementing its invention on MPEG-1 (and other traditional decoding standards), it would have been obvious to combine MPEG-1 and Morimatsu. RX-1987 at 2:46-48; 9:8-12. And Nokia has not argued otherwise.

The combination of MPEG-1 and Morimatsu renders claims 8 and 10 of the ’321 Patent obvious under two different theories. The first theory is largely dependent on the disclosures described above with respect to MPEG-1 in Section IV.D.1. Specifically, under the first theory, a closed GOP is the independent sequence, the closed_gop flag is the indication of the start of that sequence, and temporal_reference is the identifier value that is both decoded and reset. Section IV.D.1. However, due to the unique technical set up described in Morimatsu, the combination of MPEG-1 and Morimatsu provides additional support for why it would have been obvious for a *decoder* to reset temporal_reference.

Morimatsu describes using both intra-frames (I frames) and inter-frames in its encoding/decoding process. RX-1987 at 3:44-46. However, Morimatsu states that the inter-frames are only encoded/decoded using prediction from the immediately preceding frame—which

corresponds to a P frame. *Id.* at 2:34-37, 3:8-10. As such, the encoding and decoding process of Morimatsu contemplates the use of only I and P frames—without using B frames. Dr. Hemami will explain that this results in the decoding order and display order of Morimatsu being *identical*. As a result, in a Morimatsu decoder implementing Morimatsu’s version of MPEG-1, the frame following the closed_gop flag is always an I frame, and it always has a temporal_reference equal to zero. Given this result, it would have been obvious to a POSITA that the Morimatsu *decoder* could simply reset temporal_reference to zero, regardless of the value decoded from the bitstream, for the first frame following a closed_gop flag equal to 1—for the same reasons as described above with respect to MPEG-1. *See* Section IV.D.1.e.

Under the second theory, the combination of Morimatsu and MPEG-1 renders claims obvious in view of Morimatsu’s disclosure of the scene change correlation and related technologies, as described below.

a) Limitations 8[pre]/10[pre] - Morimatsu’s Scene Change Disclosure Meets the Preamble Limitations

To the extent the preamble is limiting, the combination of MPEG-1 and Morimatsu expressly discloses the preamble limitations. MPEG-1 discloses the preamble limitations for the same reasons as described above. *See* Section IV.D.1.a. Morimatsu likewise discloses methods for coding and decoding compressed video sequences, including inter-frame and intra-frame coding processes applied to sequences of frames. RX-1987 at abstract, claim 1; 1:15-18; 2:34-45. Morimatsu further discloses decoders for decoding compressed video sequences. RX-1987 at Fig. 27. Thus, limitations 8[pre] and 10[pre] are met.

b) Limitations 8[a]/10[a] - Morimatsu’s Scene Change Disclosure Meets the Indication Limitation

As discussed above, the video sequences in MPEG-1 contain only I-pictures and P-pictures—making them the same in decoding and display order. And Morimatsu expressly teaches



that a P-picture is predicted from the immediately preceding picture. *Id.* at 2:34-37, 3:8-10. As Dr. Hemami will explain, the result of this configuration is that each and every I-picture in a Morimatsu video sequence is necessarily the start of an independent sequence.

Morimatsu also discloses a scene change correlation value that is detected by a correlation measurement unit. *Id.* at 16:64-17:3. As Morimatsu explains “[w]hen the correlation value between the images of the two frames is smaller than a predetermined value, then the correlation measurement unit” assumes a scene change. *Id.* at 17:6-9, 18:1-28. And Morimatsu explains that the frame following a scene change must always be an I-frame. *Id.* at 4:13-16, 7:44-46, 9:67-10:2. Thus, the correlation value being below a predetermined threshold is “an indication” that the next frame is an I-frame, and is thus an indication that the next frame is the first frame of an independent sequence.

Nokia argues that the correlation value of Morimatsu is not decoded, but is calculated by the decoder. Again, it is Respondents’ position that “decoding” in the ’321 Patent requires retrieving a value (in binary form) directly from the bitstream. Respondents agree that the correlation values are not “decoded” under that position. However, Nokia’s position is that any value that is calculated or derived by a decoder based on information in the bitstream is “decoded.” And it cannot be disputed that correlation value is calculated from information in the bitstream—it is derived directly by comparing two image frames which are transmitted in the bitstream to the decoder. *Id.* at 18:23-28. Thus, the correlation value of Morimatsu is decoded from the bitstream under Nokia’s understanding of “decoding.” As such, the combination of MPEG-1 and Morimatsu discloses the requirements of limitations 8[a] and 10[a].

c) Limitations 8[b]/10[b] - Morimatsu’s Scene Change Disclosure Meets the Starting the Decoding Limitation

[REDACTED]

The combination of MPEG-1 and Morimatsu teaches limitations 8[b] and 10[b]. Again, MPEG-1 teaches beginning decoding at random access points, including at an I-picture—which is necessarily the start of an independent sequence in Morimatsu—and will include the I-picture immediately following a scene change. RX-1935 at D.7.1.1. Accordingly, the combination of MPEG-1 and Morimatsu discloses the requirements of limitations 8[b] and 10[b].

d) Limitations 8[c]/10[c] - Decoding Identifier Values

The combination of MPEG-1 and Morimatsu teaches limitations 8[c] and 10[c]. Specifically, MPEG-1 teaches decoding temporal_reference, which is an identifier value according to a numbering scheme. *See* Section IV.D.1.a. Further, Morimatsu teaches a second identifier value, called “frame number,” which starts “from the initial frame.” RX-1987 at 6:28-30; *see also id.* at 9:22-23 (decoder side); 17:12-14 (encoder). Nokia argues that the frame number in Morimatsu is (i) not an identifier value, and (ii) not decoded—essentially repeating its arguments with respect to the IP counter in Adolph. Nokia’s arguments fail for the same reasons as described above with respect to Adolph’s IP counter. *See* Section IV.D.2.

e) Limitations 8[d]/10[d] - Resetting the Identifier Value of the First Frame

Finally, the combination of MPEG-1 and Morimatsu teaches limitations 8[d] and 10[d]. Morimatsu expressly discloses that the decoder resets the value of frame number following a scene change—i.e., for the indicated first frame. RX-1987 at 18:19-24 (“[A] reset signal for resetting the frame number counter 212 can be generated when a scene is switched into another scene in moving picture.”).

4. Two Different Versions of VideoLAN Client (“VLC”) Invalidate Claims 8 and 10 of the ’321 Patent

a) VLC Version 0.2.90 Invalidates Claims 8 and 10 Due to the Implementation of MPEG-1

[REDACTED]

VLC version 0.2.90 was released in October 2001 and therefore predates Complainants' asserted January 23, 2002 priority date for the '321 Patent. RX-2652. There is no dispute that VLC version 0.2.90 qualifies as prior art. Moreover, it is undisputed that VLC version 0.2.90 implemented MPEG-1 decoding. RX-4031 (ASUS1448-00072410).

Since VLC version 0.2.90 implemented MPEG-1, it would have been obvious to modify VLC version 0.2.90 in the same manner as described above with respect to MPEG-1. *See* Section IV.D.1. Thus claims 8 and 10 would have been obvious in view of VLC version 0.2.90.

b) VLC Version 0.7.2 Invalidates Claims 8 and 10 Due to the Implementation of H.264

VLC version 0.7.2 was available at least as of May 21, 2004. <https://web.archive.org/web/20040904082658/http://www.videolan.org:80>. Importantly, VLC 0.7.2 implemented H.264 decoding. RX-4032 (RESP1448-00036330); CX-4809; CX-6316. While Respondents contend that Nokia has not demonstrated that the implementation of H.264 meets each and every limitation of claims 8 and 10, to the extent Nokia succeeds on its claim, then VLC version 0.7.2 invalidates those claims by implementing H.264.

The only real dispute is whether VLC version 0.7.2 qualifies as prior art to the '321 Patent. Nokia argues that the '321 Patent is entitled to a January 23, 2002 priority date corresponding to Finnish application 20020127. CX-6090. However, the requirement that the decoder perform a "resetting" step for identifier values was not described or enabled until the filing of the application that resulted in the '321 Patent on January 25, 2006 (when one of the claims filed with the application included a requirement that the decoder reset the identifier).

As set forth above in Section IV.A., the parties dispute the meaning of "reset" or "resetting." Nokia argues that "resetting" includes both setting for the first time, and setting again, while Responds contend that "resetting" means setting again. In order to demonstrate that the

Finnish application provides written description support for a decoder resetting an identifier value, Nokia points to paragraphs [0048] and [0049]. Yet, these paragraphs describe only “setting” (e.g., setting for the first time), and not “resetting” (setting again):

[0049] According to a preferred embodiment of the invention, this can be avoided in the decoder by defining an initiation image in an independently decodable Group of Pictures GOP that is activated at the random point of the video file, and the number of the initiation image is set at zero. This independently decodable image group can thus be a sub-sequence of an INTRA-layer, for example, in which case an I-frame is used as the initiation image, or, if scaling originating from the base layer is employed, the independently decodable image group is a sub-sequence of the base layer, in which case the first image frame of the sub-sequence, typically an I-frame, is usually used as the initiation image. Consequently, when activated at a random point, the decoder preferably sets the identifier of the first image frame, preferably an I-frame, of the independently decodable sub-sequence at zero. Since the sub-sequence to be decoded may also comprise other image

Id. at [0048] - [0049].

This is not sufficient to provide the required written description support for the “resetting” limitation under Respondent’s proposed construction. Indeed, Dr. Richardson admitted that he did not provide any analysis or opinions that the Finnish application provides support for the “resetting” limitation if Respondents’ construction is adopted. CX-6342 (Richardson) at 324:17-19. As such, if Respondents’ construction of “resetting” is adopted, the ’321 Patent is only entitled to January 25, 2006, which makes VLC version 0.7.2 invalidating prior art due to its implementation of H.264, if the Court finds that H.264 infringes.

5. Secondary Considerations

Nokia has failed to establish any secondary considerations supporting the non-obviousness of the asserted claims of the ’321 Patent. Nokia alleges that secondary considerations exist in the form of (i) commercial success, (ii) long-felt but unmet need, (iii) initial skepticism, unexpected results, and failed attempts by others, (iv) industry recognition and praise, (v) copying, and (vi) licensing. For each of these alleged secondary considerations, Nokia points generally to the H.264,

[REDACTED]

H.265, and AV1 standards and asserts, without evidentiary support, that such considerations relate to the “specific features” of the ’321 Patent identified in Nokia’s infringement contentions.

These assertions fail as a matter of fact and law. With the exception of licensing, Nokia has produced no evidence establishing any nexus between the alleged secondary considerations and the claimed invention of the ’321 Patent. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. Accordingly, Nokia has failed to establish any nexus between the ’321 Patent and any alleged commercial success, long-felt need, skepticism, unexpected results, failed attempts by others, industry recognition or praise, or copying associated with the H.264, H.265, or AV1 standards.

With respect to licensing, Nokia identified licenses that include the ’321 Patent. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. [REDACTED]

[REDACTED]

Because Nokia has failed to demonstrate any nexus between the asserted claims of the '321 Patent and the alleged secondary considerations, and [REDACTED], secondary considerations do not support, and cannot overcome, the clear showing of obviousness of the Asserted Claims.

V. U.S. PATENT NO. 9,036,701

A. Claim Construction

As set forth in the parties' Joint Post-*Markman* Hearing Claim Construction Chart, the parties dispute the constructions of one term of the '701 Patent, which has been briefed and argued at the January 14, 2026 *Markman* Hearing. Respondents proposed that "entropy coding symbols" means "entropy encoding symbols." This is driven by the structure of the claim, which requires performance of steps in an "encoding" order and not a "decoding" order. As Nokia's infringement allegations are only directed to decoding implementations, if Respondents' claim construction position is adopted, there is no infringement.

B. Infringement

1. Nokia's Citations to H.265 and Testing Evidence Do Not Demonstrate Infringement

The Accused Products do not infringe the Asserted Claims of the '701 patent. **First**, Dr. Chrissan's reliance on the H.265 Standard fails to demonstrate infringement because the Asserted Claims do not map to the H.265 Standard. **Second**, Dr. Chrissan's so-called "testing-based evidence" is not evidence of infringement. Playing video on a few Accused Products does not demonstrate that those products meet each and every limitation required by the claims. **Finally**,

neither Dr. Chrissan's testing-based evidence or his source code evidence fails to demonstrate infringement for the same reasons his standard-based analysis fails.

a) Nokia's Analysis of the H.265 Standard Fails to Demonstrate Infringement of the Asserted Claims

Nokia asserts that the H.265 Standard satisfies the Asserted Claims of the '701 patent but as the evidence will show, Nokia's assertion is incorrect. The primary reasons relate to limitations 1[a]/8[a] and 1[b]/8[b] which require "determining a frequency of occurrence threshold" based on "syntax elements" and "categorizing a plurality of syntax elements...based on the frequency of occurrence threshold." Nokia's positions with respect to those limitations (and others) are incorrect, as set forth below.

1) Claims 1 and 8 - Nokia's Interpretation of "Syntax Elements" is Incorrect

Each of the asserted claims recites "syntax elements" in a bit stream in several different limitations. Dr. Chrissan alleges that "non-zero transform coefficients" are the claimed syntax elements (purportedly based on the definition of syntax elements in the H.265 Standard) and the Standard's coefficient flags and remainder (e.g., `sig_coeff_flag`, `coeff_abs_level_greater1_flag`, `coeff_abs_level_greater2_flag`, `coeff_abs_level_remaining`, and `coeff_sign_flag`) are merely symbols. The evidence will show, and Dr. Schonfeld will explain, why Dr. Chrissan's interpretation of syntax elements is incorrect. The definition of syntax element in the H.265 Standard, "[a]n element of data represented in the *bitstream*," refers to data elements that are themselves present in the bitstream as the Standard specifies. JX-0137 (H.265) at 12, § 3 (italics in the original). Dr. Chrissan acknowledges this when he states that "[s]yntax elements in video appear within bitstreams." As Dr. Schonfeld will explain, Dr. Chrissan's infringement read removes the boundary of "syntax element" by his overly broad interpretation of "represented" in

[REDACTED]

the H.265 Standard such that entire video bit streams prior to any video encoding can constitute syntax elements. This interpretation is incorrect.

First, the H.265 Standard identifies the *coefficient flags and remainder* as syntax elements of the residual coding syntax structure, not as symbols. *See* JX-0137 (H.265) at 220, Table 9-43; *id.* at 208, Table 9-4. *Second*, in addition to the express identification of the coefficient flags and remainder as syntax elements in the Standard's tables, the H.265 Standard supports this understanding through notations and other definitions. *See, e.g., id.* at 19, § 5.10; *see also id.* at 7, § 3.57 (“**flag**: A variable or single-bit *syntax element* that can take one of the two possible values: 0 and 1.”) (boldface and italics in the original). *Third*, the evidence will show that even Dr. Chrissan referred to the coefficient flags and remainder as syntax elements. *Fourth*, the evidence will show that the Dr. Chrissan's VQ Analyzer testing evidence uses “syntax element” in the same way H.265 defines it, and contrary to Dr. Chrissan's mapping. Screenshots of the VQ Analyzer shows that “Syntax Info” contains a column titled “SE Name,” which is understood to be the Syntax Element Name. Within the “SE Name” column are all of the coefficient flags and remainder that Dr. Chrissan alleges to be symbols.

The H.265 Standard does not formally define the word “symbol.” *See* JX-0137 (H.265) at 4-14, § 3 (definitions). But the Standard uses “symbol” normatively in the entropy coding context to refer to the binary value coded by the arithmetic coder. *Id.* at 235, § 9.3.4.3.1. In particular, there exists the most probable symbol (“MPS”) and the least probable symbol (“LPS”). *Id.* In other words, a “symbol” is the binary value being coded/decode by CABAC at a given step. This usage of symbol in the Standard is analogous to what Nokia *distinguished* from “syntax element” during the prosecution of the '701 patent. Nokia sought to overcome a rejection of the pending claims in the '701 patent in view of U.S. Patent Pub. No. 2009/0141806 A1 (“Marpe '806”) (RX-2268) by



distinguishing syntax elements from “the bits corresponding to a bin string having a 50/50 change of being 1 or 0.” JX-0003 (“’701 Patent FH”), Apr. 30, 2014 Applicant Remark at 6. Moreover, Nokia recognized that syntax elements are what appears at the input to a binarizer, not symbols. *Id.* at 7; *see also* JX-0003, Dec. 2, 2014 Applicant Remark at 7-8; JX-0137 (H.265) at 220, Table 9-43; *see also id.* at 224, § 9.3.3.11; RX-2268 (Marpe ’806) at Fig. 2. Nokia’s understanding of syntax elements as reflected in the prosecution history is consistent with the industry usage and contradicts Dr. Chrissan’s mapping.

To the extent Dr. Chrissan and Nokia attempt to argue that coefficient flags and remainder are syntax elements, Dr. Schonfeld will explain how this undisclosed theory also fails. Dr. Chrissan’s opinion contradicts itself because he asserts that “[t]he correct syntax element is *the number of non-zero transform coefficients*” **and** that “the syntax element that is categorized is the non-zero transform coefficients within a transform unit.” As Dr. Schonfeld will explain, neither theory demonstrates infringement of the ’701 patent. Instead, it shows that Dr. Chrissan has to alter his definition of syntax element for different parts of the claim, which is improper. Just as non-zero transform coefficients is not a syntax element, neither is the number of non-zero transform coefficients.

2) 8[pre] and 13 – No Evidence of the Claimed “Computer Program Code”

The Accused Products do not infringe claims 8 and 13 of the ’701 patent because they do not include “at least one processor and at least one memory including computer program code . . .” to perform the steps recited in those claims. As Dr. Schonfeld will testify, a POSITA reading this claim limitation would understand it to require computer program code (*i.e.*, software) to cause the apparatus to perform each of the recited steps and Dr. Chrissan has failed to show that the Accused Products have the required computer program code. Indeed, Dr. Schonfeld will explain

[REDACTED]

that Dr. Chrissan merely cites hardware code and hardware code, by definition, does not show a computer program code running on a processor. Dr. Chrissan's reliance on testing evidence from VQ Analyzer is also insufficient. VQ Analyzer results cannot show whether any Accused Products comprise at least one processor and at least one memory including computer program code as recited by this preamble. Accordingly, the evidence will show that Dr. Chrissan has failed to show any Accused Product satisfies this limitation.

3) 1[a]/8[a] and 1[b]/8[b] – The Frequency of Occurrence Limitations Are Not Met

The asserted claim limitations recite a “frequency of occurrence threshold.” ’701 patent, claims 1[a]/8[a] (“determine[ing]/[e] a **frequency of occurrence threshold** based on an expected frequency of occurrence”); claims 1[b]/8[b] (“categoriz[ing]/[e] a plurality of syntax elements of video content into first and second categories **based on the frequency of occurrence threshold** . . .”). Dr. Chrissan alleges that a constant value “8” constitutes the claimed frequency of occurrence threshold. But Dr. Schonfeld will explain that there are multiple reasons that the constant value 8 actually denotes a position in a scan order and not a frequency of occurrence threshold as required by the asserted claims.

First, the constant value 8 is related to the number of times the significant flag has appeared when the transform coefficients are encoded or decoded in reverse order in a 1D scan of the 4x4 block. This can be seen where the constant 8 appears in the residual coding syntax:

```

firstSigScanPos = 16
lastSigScanPos = -1
numGreater1Flag = 0
lastGreater1ScanPos = -1
for( n = 15; n >= 0; n-- ) {
    xC = ( xS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 0 ]
    yC = ( yS << 2 ) + ScanOrder[ 2 ][ scanIdx ][ n ][ 1 ]
    if( sig_coeff_flag[ xC ][ yC ] ) {
        if( numGreater1Flag < 8 ) {
            coeff_abs_level_greater1_flag[ n ]
            numGreater1Flag++
            if( coeff_abs_level_greater1_flag[ n ] && lastGreater1ScanPos == -1 )
                lastGreater1ScanPos = n
            else if( coeff_abs_level_greater1_flag[ n ] )
                escapeDataPresent = 1
        } else
            escapeDataPresent = 1
        if( lastSigScanPos == -1 )
            lastSigScanPos = n
        firstSigScanPos = n
    }
}
}

```

JX-0137) at 60, § 7.3.8.11. The constant value 8 is compared against numGreater1Flag (red box), which is a counter initialized to 0 and increments when sig_coeff_flag[xC][yC] (blue box) is 1. *See id.* (“numGreater1Flag < 8” (yellow highlight)). The flag sig_coeff_flag[xC][yC] specifies for the “transform coefficient location (xC, yC) within the current transform block whether the corresponding transform coefficient level at the location (xY, yC) is non-zero . . .” *Id.* at 112, § 7.4.9.11. Note that xC and yC denote a location of the coefficient, which is derived from a ScanOrder array, which is also a positional (scan order) quantity. In other words, the constant “8” is simply compared to a counter and therefore does not represent a frequency of occurrence threshold, nor is the constant “8” compared to a frequency of occurrence as required.

Second, because “8” is compared with a counter value, it cannot represent a *frequency* of occurrence threshold because a frequency cannot be computed by a decoder from an unknown (until after decoding) and varying number of non-zero transform coefficients.

Third, Dr. Schonfeld will explain how Dr. Chrissan’s own data shows that the constant value 8 is not a frequency of occurrence threshold. For example, considering Chrissan’s example 4x4 transform unit, the first non-zero coefficient (in reverse 1D scanning order) is at (2,3) (red



box); the eighth non-zero coefficient is 5 at (1,1) (green box); the tenth non-zero coefficient is -5 (1,0) (blue box). R-APPX at 12 (top figure). Dr. Schonfeld will explain how the green and blue non-zero coefficients have the same absolute value (*i.e.*, 5), but because they are at different locations relative to the first non-zero coefficient at (2,3) (red box), they are represented differently in the coded bitstream. Specifically, the eighth non-zero coefficient (5) is represented by `coeff_sign_flag = 0` (denoting a positive value) `abs_level_greater1_flag=1`, and `coeff_abs_level_remaining = 3` (green boxes). The tenth non-zero coefficient -5 is represented by `coeff_sign_flag = 1` (denoting a negative value) and `coeff_abs_level_remaining = 4` (blue boxes). R-APPX at 13. Dr. Schonfeld will explain how two coefficients have the same absolute value but are represented by different syntax elements in the bitstream because their respective location is greater than (>) or less than or equal to (<=) 8 of the first non-zero coefficients when read in reverse 1D scanning order. Dr. Schonfeld will further explain that Dr. Chrissan's identified non-zero coefficients are processed differently based on their respective position in the sequence of the non-zero coefficients when read in reverse scanning order. *Compare* R-APPX at 12, second row image (diagonal scan) and third row image (vertical scan). For example, whether the values ((1, 0) and (1, 1)) are above or below the alleged threshold of 8 depends on the scanning pattern, which is a positional pattern, even though the 4x4 transform unit remains the same, *i.e.*, there is no change in the frequency of occurrence of syntax elements, yet the results of the purported categorization would be different under Dr. Chrissan's theory. R-APPX at 12, bottom row image. Accordingly, 8 is not a frequency of occurrence threshold, nor is used to compare with a frequency of occurrence of a syntax element. Indeed, Dr. Chrissan even agrees that these coefficient flags are positional quantities when referencing the H.265 Standard. *See* JX-0137 (H.256) at 111, § 7.4.9.11

[REDACTED]

(“coeff_abs_level_greater1_flag[n] ‘specifies for the scanning *position* n whether there are absolute values of transform coefficients levels greater than 1.”) (emphasis added))

i. **The Threshold Is Not “Determined . . . Based On An Expected Frequency of Occurrence”**

Neither Respondents nor any Accused Products determine a frequency of occurrence threshold. As an initial matter, Dr. Chrissan alleges two possible theories for infringement: (1) JVTVC did the “determining” when it was drafting the H.265 Standard or (2) the Accused Products “determine” when decoding. These theories both fail. For the first, *if* it is the JVTVC that “determined” the frequency of occurrence threshold, then Accused Products cannot infringe this limitation because they are not meeting the claims. For the second, Dr. Chrissan’s theory is inconsistent with the plain meaning of “determining.” It is contrary to the plain and ordinary meaning of “determining” to argue that a product “determines” a value when that value is fixed and hardcoded into the design. Dr. Chrissan’s theory conflates “determine” with “predetermine,” two terms that are clearly distinguished in the ’701 patent. *See, e.g.*, JX-0001 (’701 patent) at 12:65-13:1 (“a predetermined probability”); *id.* at 9:63-65 (“the frequency threshold may be determined based on a frequency of symbol occurrence in the highest bitrates allowed in a particular system.”). The ’701 patent describes what a POSITA would have understood to be determining by a product with respect to categorizing the syntax elements, *e.g.*, making some kind of decision from which different results may be derived. *See id.* at 9:57-63. This is analogous to what contributors to the standard understood. *See* RX-2265 (JCTVC-I0281) (“determining” a quantity by a product, *e.g.*, computing a quantity c1NumFlags); *id.* at ACER1448_01308004 (JCTVC-I0281), 01307999, 01307998; R-APPX at 17 (top image).

Moreover, the alleged frequency of occurrence threshold is not determined “based on an expected frequency of occurrence of syntax elements in a bit stream.” If Dr. Chrissan alleges that

[REDACTED]

the syntax elements are non-zero coefficients then there is no evidence that the threshold (8) is determined based on an expected frequency of occurrence of non-zero coefficients (replacing non-zero coefficients for syntax elements in claim language) “in a bit stream.” Indeed, as discussed below with respect to the Qualcomm proposal to the JCTVC, the value 8 was an arbitrary choice and there is no evidence of any expectations of frequency of values in a bit stream. Dr Chrissan further does not show anything for a proper reading, *i.e.*, where the syntax elements are the flags. In either case, Dr Chrissan has failed to show an expected frequency of occurrence of anything “in a bit stream” as required by the claims. Instead, Dr. Chrissan’s theories are based on 4x4 transform units—but that is not a bit stream as defined by the H.265 Standard. *See* JX-0137 at 5, § 3.13 (a bit stream is “[a] sequence of bits, in the form of a[n] *NAL unit stream* or a *byte stream*, that forms the representation of *coded pictures* and associated data **forming one or more coded video sequences (CVSs).**”) (italics in original, boldface added). Thus, a bitstream contains at least one I-picture. A 4x4 transform unit is a smaller unit and may belong to a P-picture. A 4x4 transform unit is not a bit stream.

H.265’s “numGreater1Flag<8” Feature Does Not Meet the ’701 Patent Claim: Nokia does not claim that it contributed the concept of the ’701 patent to any standards-setting body. Nor can they as the feature of the H.265 standard that Nokia relies on for showing infringement was not contributed by Nokia (it was contributed by Qualcomm) and the history of how that feature came to exist in the standard shows that the Accused Products do not infringe.

The ‘numGreater1Flag < 8’ feature in Section 7.3.8.11 of the H.265 Standard was identified by Dr. Chrissan as meeting certain ’701 patent claim limitations. JX-0137 at Section 7.3.8.11 (“if (numGreater1Flag <8) { coeff_abs_level_greater1_flag[n] numGreater1Flag++”). Dr. Chrissan states that “the Accused Products decode the coeff_abs_level_greater1_flag for the

[REDACTED]

first 8 non-zero transform coefficients” and the “remaining non-zero transform coefficients are placed in the second category and do not receive a greater 1 flag, rather they use the `coeff_abs_level_remaining` remaining syntax element to derive the value of the coefficient.” However, as Dr. Schonfeld will testify, the Joint Collaborative Team on Video Coding (JCTVC) history shows that the ‘`numGreater1Flag < 8`’ syntax, proposed for addition to the H.265 standard by Qualcomm (JCTVC-H0554), cannot meet the ’701 patent claims because (1) it was understood as a fixed threshold, and not an adaptive one that is “based on an expected frequency of occurrence of syntax elements in a bitstream” (such as one proposed by Research in Motion (JCTVC-I0281)), and (2) the constant 8 is not “determined” by the Accused Products and, therefore, cannot infringe the ’701 patent. *See* RX-1998 (H0554 Proposal); *see also* RX-1996 (Qualcomm presentation); RX-2259 (JCTVC-H0489); RX-2260 (JCTVC-H0728); RX-2261 (JCTVC-H1000); RX-2257 (JCTVC-H1003); RX-2262 (JCTVC-I0002) at ACER1448_1306133, 1306166; RX-2264 (JCTVC-I0281), and RX-2266 (JCTVC-I0359); RX-2264 (JCTVC-I0281); RX-2266 (JCTVC-I0359); RX-2267 (JCTVC-I1000); RX-2258 (JCTVC-I1003); RX-2484 (JCTVC-J0285); RX-2483 (JCTVC-J1000); RX-2258 (JCTVC-J1003); RX-4033 (JCTVCH0233). Nokia and its expert, Dr. Chrissan, have failed to adequately rebut Respondents on this issue. As Dr. Schonfeld will testify, Dr. Chrissan’s opinion regarding the development of the `numGreater1Flag<8` feature in H.265 (including Qualcomm and RIM’s proposals) is incorrect. For example, Dr. Chrissan’s interpretation of JCTVC-I0281 (RX-2264) is incorrect—the proponents of this proposal were attempting to explain that because there will be greater than 2 non-zero coefficients having the two flags themselves (`greater1/greater2`) are simply redundant.

ii. The Alleged Syntax Elements Are Not “Categorized . . . Based on the Frequency of Occurrence”

Claim limitations 1[b]/8[b] recite “categoriz[ing]/[e] a plurality of syntax elements of video content into first and second categories based on the frequency of occurrence threshold....”¹ Dr. Chrissan alleges that “non-zero transform coefficients” constitute the claimed syntax elements, but Dr. Schonfeld will explain why the “non-zero transform coefficients” are not categorized “based on the alleged frequency of occurrence threshold,” (the constant 8 according to Dr. Chrissan).

First, claim limitations 1[b]/8[b] require categorizing a plurality of syntax elements. Thus, under Dr. Chrissan’s theory that non-zero coefficient values are syntax elements and the constant 8 is the alleged frequency of occurrence threshold, each non-zero coefficient (*e.g.*, ***all*** of its associated coefficient flags and remainder) is categorized into either the first category for context update or the second category for bypassing context update. But that is not how H.265 operates. Instead, the coefficient flags and remainder are processed differently by virtue of their label, not by comparison to a frequency of occurrence threshold. For example, as illustrated (R-APPX at 14), the first test result capture that Dr. Chrissan relies on shows that the seventh non-zero coefficient, 3 at (2, 0), is represented by a syntax element subject to context update (purple box) and two syntax elements that bypass context update (orange). R-APPX at 14-15.

Second, Dr. Chrissan’s testing demonstrates no infringement under his own theory. As the evidence will show, in all of the captures Dr. Chrissan cites, the number of coefficient flags in a 4x4 transform unit that are subject to context update is *larger* than the number of sign flags and

¹ Dr. Schonfeld will explain that a POSITA would understand “occur[ring] less than” and “occur[ring] greater than” in the wherein clause to refer to the frequency of occurrence of the syntax elements, which claims 6/13 make explicit: “categorizing the plurality of syntax elements based on a relationship of the frequency of occurrence of the syntax elements to a predefined threshold.”

level remaining that bypass context update. But the claim requires the more frequently occurring syntax elements to be in the second category and to bypass context update. Demonstrating the importance of this requirement, it was the result of a certificate of correction. *See* JX-0001. Dr. Chrissan’s infringement theory achieves the *opposite* of what the claims require: the first category includes the syntax elements that occur more frequently, and the second category includes syntax elements that occur less frequently. Therefore, his infringement theory necessarily requires that the first category include syntax elements that occur greater than any alleged frequency of occurrence threshold and the second category include syntax elements that occur less than any alleged frequency of occurrence threshold. This is the exact opposite of what the claim requires.

pages in App. C.1	# significant flag	# greater1 flag	# greater2 flag	# context updated	# level remaining	# sign flag	# bypassed
14-16	13	8	1	22	8	11	19
20-21	6	4	0	10	0	3	3
41-43	11	8	1	20	6	11	17
46-47	11	5	1	17	0	5	5
76-77	11	8	1	20	4	10	14
81-82	12	6	1	19	3	6	9
135-136	12	8	1	21	2	8	10
139-141	3	4	1	8	2	4	6
162-164	12	8	1	21	4	11	15
167-168	2	3	1	6	1	3	4

Third, Dr. Schonfeld will explain how Dr. Chrissan disregards the sign of the non-zero transform coefficients, his alleged syntax elements, by ignoring the sign flag, presumably because the sign flag contradicts his theory. Absent a sign flag, the non-zero coefficients cannot be correctly reconstructed by the decoder.

Fourth, the evidence will show that Dr. Chrissan is wrong to assert that “[i]n the first scanning pass of a transform unit, the Accused Products determine how many non-zero transform coefficients are present in the transform unit by decoding the sig_coeff_flag[.]” *See* JX-0137 at 59, § 7.3.8.11; R-APPX at 15 (top image). Nothing in the Standard’s “for loop” (*i.e.*, the first



scanning pass) counts or otherwise determines how many non-zero transform coefficients are present, *i.e.*, how many times sig_coeff_flag[xC][yC] is equal to 1. Instead, sig_coeff_flag[xC][yC] is decoded. If it is equal to 1, inferSbDcSigCoeffFlag is set to 0 in order to set a condition in the next iteration of the “if statement.” The “for loop” contains nothing to determine *how many* non-zero transform coefficients are present but instead determines *where* non-zero transform coefficients are present through decoding sig_coeff_flag[xC][yC]. Without the number of the non-zero coefficients, there is no frequency of occurrence of the non-zero coefficients. As the pseudocode shows, the residual coding/decoding process does not determine the number of non-zero coefficients. Both the encoder and decoder use the sig_coeff_flag to determine the existence and location of non-zero transform coefficients, not the number of non-zero coefficients. Nor does the encoder or decoder use the sig_coeff_flag to determine a hypothetical frequency of occurrence of the non-zero transform coefficients, the alleged syntax elements.

Additionally, Dr. Schonfeld will explain that the sig_coeff_flag could not be used to determine the frequency of occurrence of the non-zero transform coefficients. Determination of the frequency of occurrence of the non-zero transform coefficients would require a determination of the ratio of the number of non-zero transform coefficients in a bit stream to the overall number of syntax elements in the bit stream. The sig_coeff_flag cannot be used to make a determination and thus there is no frequency of occurrence of the non-zero transform coefficients. Additionally, the space of transform coefficients in a 4x4 unit is not the entirety of syntax elements in a bit stream. And therefore, even if hypothetically half of the coefficients in each and every 4x4 unit were non-zero coefficients, it would not convey a frequency of occurrence for the non-zero coefficients in a bit stream corresponding to ½. Even if we were to further consider a hypothetical scenario of a bit stream that consisted of only transform coefficients, the frequency of occurrence

[REDACTED]

of the non-zero coefficients in this hypothetical scenario would still not correspond $\frac{1}{2}$ because the number of non-zero coefficients is typically lower, as Dr. Schonfeld can explain.

Fifth, Dr. Chrissan's infringement theory would still fail even if we ignore that the constant 8 is not a frequency of occurrence threshold. Dr. Chrissan's theory would then require categorizing the non-zero coefficients into the first category for context update when fewer than 8 non-zero coefficients are present in the 4x4 unit and categorizing *all* of the non-zero coefficients into the second category to bypass context update when more than 8 non-zero coefficients are present. That is not how the H.265 Standard works. For example, a transform unit with fewer than eight (e.g., six) non-zero coefficients includes elements (i.e., `coeff_sign_flag` and `coeff_abs_level_remaining`) that bypass context update. R-APPX at 16 (top image). On the flip side, a transform unit with more than eight (e.g., twelve) non-zero coefficients has elements (i.e., `sig_coeff_flag`, `coeff_abs_level_greater1_flag`, and `coeff_abs_level_greater2_flag`) that are subject to context update. R-APPX at 16 (bottom image).

Sixth, to the extent Dr. Chrissan argues that categorization is performed based on the value of the non-zero coefficients, such alleged categorization may be performed by an *encoder*, not a decoder. An encoder may have access to the values of the non-zero coefficients during the encoding process, but a decoder, on the other hand, does not know the value of a non-zero coefficient until all of its constituent parts (i.e., all of its coefficient flags are remainder) have been decoded. Therefore, the decoder cannot categorize based on the value of the coefficients, which occurs before entropy decoding.

Seventh, the claims plainly require that the first category be comprised of syntax elements that occur less than the frequency of occurrence threshold. Dr. Chrissan alleges the fixed value of 8 to be the frequency of occurrence threshold, but his opinion according to the H.265 Standard



always allows for up to 8 syntax elements to be present and included in the first category. There exists no requirement in the H.265 Standard that the number of non-zero transform coefficient values be less than eight (i.e., seven or less) for the coefficients to be placed in a category that will undergo context updating.

Dr. Chrissan’s alternate theory: To the extent Dr. Chrissan opines that the coefficient flags and remainder are the claimed syntax elements, this theory fails because these alleged syntax elements are not categorized based on Dr. Chrissan’s alleged threshold, the constant value 8. *First*, these syntax elements are assigned to context update or bypass simply **by their respective types**—the H.265 Standard shows that significant flag, greater1 flag, and greater2 flag are *always* subject to context update, while level remaining and sign flag *always* bypass context update. *See* JX-0137 at 228-29, Table 9-48; *id.* at 235, Fig. 9-5; R-APPX at 15 (middle image). Figure 9-5 of the H.265 Standard shows that branching between DecodeBypass (for syntax elements in the alleged second category) and DecodeDecision (for syntax elements in the alleged first category) is based on a bypassFlag, not the alleged frequency of occurrence threshold. R-APPX at 15 (bottom image). *Second*, because the categorization of syntax elements is based on their *respective types* and *not on their frequency of occurrence*, Dr. Chrissan’s tests disprove that coeff_abs_level_remaining has a frequency of occurrence **greater** than the alleged threshold (“8”). R-APPX at 17 (bottom table).

Third, the categorization of these syntax elements is not based on the alleged frequency of occurrence threshold, the constant 8, because the frequency of occurrence of these syntax elements, e.g., significant flag or level remaining, are not determined anywhere, much less used in the comparison with the constant 8. *See* JX-0137 at 60-61, ¶ 7.3.8.11. Instead, the comparison *if* (*numGreater1Flag* < 8) does not involve the frequency of occurrence of the two syntax elements,

greater1 flag and level remaining, that Dr. Chrissan alleges to be categorized into the first or second category. Dr. Chrissan does not even allege the decoder counts how many times these syntax elements occur, much less determine their frequencies of occurrence.

Fourth, to the extent Dr. Chrissan might argue that each of greater1 flag and level remaining themselves represent a category, this “pre-categorization” is done by the standardization body, not Respondents. Such an argument is flawed for the same reasons explained above with respect to his asserted infringement theory. These syntax elements exist in the encoded bit stream received at the decoder. *See* JX-0137 at 12, § 3 (syntax element is “[a]n element of data represented **in the *bitstream*.**” (italics in original, boldface added). The VQ Analyzer test results confirm this because the displayed results are properties of the coded bit stream generated by the encoder.

Finally, as Dr. Schonfeld will explain, this “pre-categorization” remains unchanged regardless of the position of the transform coefficient in the sequence of non-zero coefficients when read in reverse scanning order, irrespective of whether the coefficient is above or below the alleged frequency of occurrence threshold provided by the constant 8. For example, level remaining is available both for coefficients that are *below* and *above* the threshold 8, yet level remaining is always assigned to the second category (for bypassing context update) even when the level remaining is for a coefficient below the alleged threshold of 8. According to the claim limitation, when the level remaining syntax element is available for coefficients that are below 8 (i.e., the alleged frequency of occurrence threshold), the claims require level remaining to be categorized to the first category (for context update). But Dr. Chrissan nonetheless asserts level remaining to be in the second category. The “pre-categorization” also remains fixed (1) regardless of the number of occurrences of greater1 flag and level remaining in the 4x4 unit, and (2) regardless

[REDACTED]

of the actual values of the non-zero coefficients or the scanning order adopted. *See* H.265 Standard at 228-229, Table 9-48.

1) 1[b]/8[b]– No First or Second Category Of Syntax Elements

Claim limitation 8[b] has two portions. The second “wherein” portion of the claim states that “syntax elements which occur greater than the frequency of occurrence threshold are categorized into the second category and syntax elements which occur less than the frequency of occurrence are categorized into the first category.” For this portion, Dr. Chrissan focuses on the hardwired classification of all H.265 syntax elements including the five transform coefficient syntax elements (*i.e.*, coefficient flags and remainder) into context update mode and bypass mode. Dr. Chrissan’s analysis is contradictory. Either the syntax elements are the non-zero transform coefficients (which they cannot be because they are neither syntax elements nor elements in a bit stream) or they are the five transform coefficient syntax elements (*i.e.*, coefficient flags and remainder). They cannot be both. Dr. Chrissan appears to use two distinct alleged syntax elements for the two different portions of the limitation, which is impermissible.

Dr. Chrissan’s analysis is further contradictory with respect to the categorization. Dr. Chrissan’s analysis relies on categorization of the non-zero coefficients into the first 8 coefficients to satisfy the first portion of the limitation, but relies on the hardwired classification of all H.265 syntax elements including the five transform coefficient syntax elements (*i.e.*, coefficient flags and remainder) into context update mode and bypass mode to satisfy the second portion of the limitation requiring that “syntax elements which occur greater than the frequency of occurrence threshold are categorized into the second category and syntax elements which occur less than the frequency of occurrence are categorized into the first category.” Again, Dr. Chrissan’s contradictory analysis is impermissible.

2) 1[c]/8[c] and 1[d]/8[d] – No First or Second Category Of Syntax Elements That Are Subjected to a Context Update or Bypass

Dr. Chrissan fails to show infringement because he fails to identify a first or second category of non-zero coefficients under his asserted infringement theory whose corresponding symbols are subjected to the correct coding. Simply put, the alleged syntax elements Dr. Chrissan points to are not split into a first or second category based on the threshold, but instead are sometimes subjected to context updating and sometimes bypassed, regardless of where they fall with respect to the threshold. For example, the non-zero transform coefficients occurring before the alleged threshold of 8 comprise all five transform coefficient syntax elements (*i.e.*, coefficient flags and remainder), which include `coeff_sign_flag` and `coeff_abs_level_remaining` that are bypassed and thus are not subject to a context update as required by the limitation. These “categorizations” do not meet the required claim limitations.

In addition, Dr. Chrissan appears to assert that `coeff_abs_level_greater2_flag` satisfies claim limitation 1[c]/8[c]. Dr. Chrissan does not include `coeff_abs_level_greater2_flag` in his analysis of claim limitation 1[b]/8[b], and thus this assertion fails for this reason.

3) Claims 6 and 13 – The Constant Value of “8” Cannot Be Both “Predefined” and “Determined”

Claims 6 and 13 recite a “predefined threshold.” By its plain meaning, this is different from the frequency of occurrence threshold that is “determine[d]” in claim limitation 1[a]/8[a]. For both claims 1 and 8, Dr. Chrissan points to the constant value of 8 as the alleged threshold. As Dr. Schonfeld will explain, the alleged threshold provided by the constant 8 cannot be simultaneously “determined” and “predefined” in the same product.

[REDACTED]

b) Nokia's Testing Evidence Is Conclusory

Nokia contends that its infringement allegations are supported by “testing-based evidence” associated with the Accused Products. Nokia’s assertions are conclusory and insufficient to prove infringement. Dr. Schonfeld will explain that the mere fact that a video decoder is capable of decoding and playing back H.265 video is not evidence that the video decoder complies with the H.265 Standard or otherwise meets each claim element in the asserted claims of the ’701 patent.

2. Nokia's Source Code Analysis Does Not Demonstrate Infringement

Dr. Chrissan presents no infringement position based on the actual structure, function, or operation of the Accused Products through the source code that was made available in this Investigation. His opinions are conclusory, do not map any discussion of source code to the specific limitations recited in the Asserted Claims, and fail to specify how his discussion of code corresponds to his H.265 infringement theories. Specifically, for the Acer, ASUS, and DI products, Dr. Chrissan cited source code from several chipmakers [REDACTED]. Dr. Chrissan also cited source code from [REDACTED] for the Acer and ASUS products, and open-source Android source code for the DI products. Dr. Chrissan’s source code analysis fails for at least the same reasons as described above with respect to the ’321 Patent. *See* Section IV.B.2.

In addition, Nokia’s analysis of the source code for the ’701 patent confirms that the Accused Products (or DI Products) do not meet the claim limitations—for two consistent reasons.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

C. Technical Domestic Industry

Nokia's allegations and evidence regarding why the technical prong of the domestic industry requirement are practiced by the DI products are identical to its infringement allegations. Indeed, Nokia relies on the same parts of the H.265 standard, and analyzes the same source code from some of the same chipmakers. Thus, Nokia has failed to meet the technical domestic industry requirement for the same reasons as set forth above with respect to infringement.

D. Invalidity

The requirements of claims 1 and 6 are very similar to the limitations recited in claims 8 and 13 such that they rise and fall together for invalidity. *See* R-APPX at 11.

1. Marpe in combination with Murashita

A POSITA would have found Claims 1, 6, 8, and 13 of the '701 patent (the "'701 Asserted Claims") to be obvious based on the teachings of U.S. Patent Application Publication No. 2005/0253740 ("Marpe") (JX-0688, RESP1448-00015592) in combination with U.S. Patent

No. 5,650,783 (“Murashita”) (JX-0690, RESP1448-00015686).

a) Motivation to Combine

As Dr. Schonfeld will explain, for at least the following reasons a POSITA would have been motivated to combine Murashita’s threshold comparison feature with Marpe’s coder in order to provide for faster and efficient coding of a video stream.

Marpe and Murashita are analogous references as both are in the same field of video coding schemes (*see* JX-0688 (Marpe), ¶¶ 3, 5, 6, 7, 10, Fig. 12; JX-0690 (Murashita) at 1:15-19, 1:20-62), both references pertain to coding/decoding schemes based on entropy coding methods (JX-0688 (Marpe) at Title, Abstract, ¶¶ 3, 10, 14; JX-0690 (Murashita) Title, Abstract, 5:15–43), and both references also disclose context update and bypass coding (*see* JX-0688 (Marpe), ¶¶ 49-51, Fig. 2; JX-0690 (Murashita) at Figs. 10, 12).

Marpe and Murashita are analogous to the ’701 patent because they are reasonably pertinent to the technical problem allegedly addressed by the claimed invention. Marpe and Murashita are also both directed to improving coding efficiency to achieve overall better performance. Marpe states that “[i]t is the object of the present invention to provide a binarization scheme and a coding scheme, which enable effective compression of data values, such as transform coefficient level values or components of motion vector differences in video signals, with moderate computational overhead.” JX-0688 (Marpe), ¶ 10; *see also id.* at ¶¶ 43, 48. Murashita also seeks to improve processing speed. JX-0690 (Murashita) 5:19–21, 5:36–43, 5:4-10.

A POSITA would have been motivated to combine Marpe and Murashita based on the references’ express teachings. Marpe discloses a desire to increase the speed of an encoding process by means of a simplified coding engine. *See* JX-0688 (Marpe), ¶ 120. Murashita satisfies that desire as it provides “coding/decoding schemes for a coding/decoding method and a device which have a faster processing speed.” *See* JX-0690 (Murashita) 5:11-13.

[REDACTED]

A POSITA would also have been motivated to combine Marpe and Murashita to increase the efficiency of Marpe’s coding scheme by incorporating Murashita’s determining a frequency of occurrence threshold feature. Murashita teaches how to “reduc[e] the number of incrementing operations [for context update] by a significant amount” while minimizing the decrease in “the compression rate caused by the absence of the updating process.” JX-0690 (Murashita) 9:16-21; *see also id.* at 3:49-53, 9:1-6, 12:31-41, 1:51-52. A POSITA, therefore, would be motivated to apply Murashita’s threshold feature to Marpe to achieve high compression ratio and fast processing.

A POSITA would have been motivated to incorporate Murashita’s “coding unit 11”, “context holding/updating unit 12”, and “controlling unit 13” into Marpe’s CABAC engine. A POSITA would have had a reasonable expectation of success in doing so. Murashita’s controlling unit 13 would control switch 113 in Marpe’s CABAC engine to indicate whether to use the regular coding engine path or the bypass coding engine path. This would be straightforward for a POSITA to implement because Murashita’s controlling unit 13 already controls whether to bypass “updat[ing] the context data” by outputting a “low” or “high” signal. *See* JX-0690 (Murashita) 6:40–47, 7:40–57, 8:10–20.

A POSITA would have also found Murashita’s threshold features to be an obvious variation of Marpe’s own use of thresholds as demonstrated by its teaching of probability intervals. *See* JX-0688 (Marpe) ¶¶ 17, 48, 51, 73-77, 82-83.

b) Independent Claim 8

- 1) 8[preamble]: “An apparatus comprising at least one processor and at least one memory including computer program code, the at least one memory and the computer**

program code configured to, with the processor, cause the apparatus to at least:”

This limitation is undisputed. Marpe discloses hardware and/or software based coding methods. JX-0688 (Marpe) ¶ 138. Marpe further discloses that the “present invention also relates to a computer program, which can be stored on a computer-readable medium such as a CD, a disk or any other data carrier” and is therefore “a computer program having a program code which, when executed on a computer, performs the inventive method of encoding or binarizing or the inventive method of decoding or recovering described in connection with the above figures.” *Id.* A POSITA would also have been knowledgeable about basic computer systems and understood that a computer includes a processor that executes computer program code stored in the memory to cause the device to carry out its functionalities.

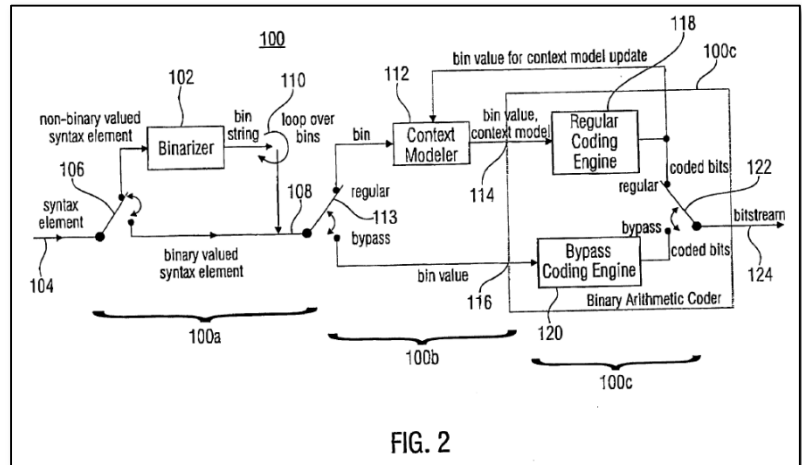
2) 8[a]: “determine a frequency of occurrence threshold based on an expected frequency of occurrence of syntax elements in a bit stream”

Marpe discloses coding schemes directed to syntax elements in a bitstream. Marpe teaches that “[e]ntropy coders map an input bit stream ... to an output bit stream,” “the output bit stream being compressed relative to the input bit stream,” and “data compression is achieved by exploiting the redundancy in the information contained in the input bit stream.” JX-0688 (Marpe) ¶ 5. Marpe discloses the use of syntax elements in a bitstream. Marpe teaches a “picture 10” is grouped “into several slices and for each slice a number of syntax elements are generated which form a coded version of the macroblocks of the slice.” JX-0688 (Marpe) ¶ 37. Marpe states that “precoder 12 transfers the syntax elements to a final coder stage,” wherein “[e]ach syntax element is a data value

having a certain meaning in the video signal bit stream” JX-0688 (Marpe) ¶ 38.

Marpe teaches syntax elements coded with either a context modeler in an CABAC entropy coder, *see* JX-0688 (Marpe) ¶¶ 39-51, 114-120; Fig. 2, or with a bypass coding engine. JX-0688

(Marpe) ¶ 44, Fig. 2. Marpe’s coder has a “switch 106 [] able to pass syntax elements arriving at input 104 to either binarizer 102 or binarization stage output 108, thereby bypassing binarizer 102.” JX-0688 (Marpe) ¶40. The second stage 100b is the



context modeler stage and comprises context modeler 112 and switch 113. JX-0688 (Marpe) ¶ 44. The “function of switch 113 is to pass the bits or bins of the bin string at binarization stage output 108 to either the context modeler 112 or to a bypass coding input terminal 116 of stage 100c, thereby bypassing context modeler 112.” *Id.*

Marpe further discloses coding schemes that rely on an expected frequency of occurrence of syntax elements in a bitstream. Marpe teaches “an effective way of adapting the binarization representation of the data value to the probability distribution of the data values.” JX-0688 (Marpe) ¶ 17. Marpe discloses that “[f]or specific bins . . . conditional probabilities can be used” and that “[t]hese specific bins will be, in general, the most frequently observed bins.” *Id.* Marpe explains that “less frequently observed bins, can be treated using a joint, typically zero-order probability model.” *Id.*

Marpe discloses determining a frequency threshold. Marpe teaches that “[a] suitably selected cut-off value may lead to the least probable data values to be binarized into code words

having equally probable bit values, whereas the most probable data values may be binarized into code words leading to a very effective arithmetic coding bit stream when using adaptive context modeling.” JX-0688 (Marpe) ¶ 17. Marpe explains how its scheme utilizes probability distribution to categorize syntax elements based on a cutoff value S (threshold). *See, e.g.*, JX-0688 (Marpe) Abstract, ¶¶ 14, 48, 58-62, 74, 76, 83, 120; Figs. 2, 4, 8. For example, Marpe states that “[a]s can be seen from FIG. 4, the absolute data value x to be binarized is compared to the cut-off value S at 200 to determine the minimum of x and S.” JX-0688 (Marpe) ¶¶ 58-61.

Marpe discloses updating the threshold based on the values in the bit stream. Marpe discloses a “probability estimation determines the code and its efficiency in the first place . . . and that this probability estimation or context model is kept up-to-date during encoding.” JX-0688 (Marpe) ¶ 48.

Combination with Murashita. Murashita teaches syntax elements in a bitstream. Murashita’s Figure 7A illustrates a “data coding device” that includes “a coding unit 11, a context holding/updating unit 12, and a controlling unit 13.” JX-0690 (Murashita) 6:27-39. Murashita discloses that “coding unit 11 receives input data, and encodes it to generate coded data by using context data stored in the context holding/updating unit 12,” wherein the “context data includes frequency of occurrence, cumulative frequency of

FIG. 4A

ORDER OF FREQUENCY	SYMBOL	FREQUENCY	CUMULATIVE FREQUENCY
0	----	0 0	3 2 7
1	0 0	1 0	3 1 7
2	0 1	7	3 1 0
3	0 2	4	3 0 6
⋮	⋮	⋮	⋮
n - 1	'M'	2	m 2
n	'N'	1	m 1
⋮	⋮	⋮	⋮
x	'A'	1	m 0
⋮	⋮	⋮	⋮
2 5 4	FD	1	3
2 5 5	FE	1	2
2 5 6	FF	1	1
2 5 7	EOF	1	0

occurrence, and an order according to the frequency of occurrence, which are provided for each symbol under given contexts.” *Id.* “[C]ontext holding/updating unit 12 not only stores the context data, but also updates the context data according to the frequency of occurrence of symbols

[REDACTED]

appearing in the input data.” JX-0690 (Murashita) 6:31-39; *see also* JX-0690 (Murashita) 4:6-9 (“symbol appears in the input data”); Fig. 9. For example, Murashita discloses tables, for example, in Figures 1A and 4A, that include a list of symbols that appear in the input data.

Murashita further discloses that an *expected frequency of occurrence of syntax elements* in the input data in a bit stream can be stored, as illustrated in Figures 4A-4C. Murashita states that “frequency and cumulative frequency are assigned to each symbol [syntax element].” JX-0690 (Murashita) 3:66-4:5; *see also* 4:6-14 (“updated frequency of occurrence”); 5:57-59 (“counting frequency of each symbol”). A POSITA would have understood the frequency of occurrence of symbols [third column] and the cumulative frequency of symbols [fourth column] to be expected frequency of occurrence of syntax elements in a bit stream. *See also*, JX-0690 (Murashita) Fig. 1A (“SYMBOL”).

Murashita further discloses *a frequency of occurrence threshold based on the expected frequency of occurrence of syntax elements*. Murashita discloses that “controlling unit 13 controls the context holding/updating unit 12 to update the context data” and “[i]n doing so, the controlling unit 13 compares a predetermined **threshold** value with a cumulative frequency of occurrence for all the symbols registered under a given context.” JX-0690 (Murashita) 6:40-47 (emphasis added). Murashita further states that “[t]hen, only when the cumulative frequency is smaller than the threshold value, the controlling unit 13 controls the context holding/updating unit 12 to update the context data for the given context.” *Id.* POSITAs would have understood comparing a cumulative frequency of symbol occurrences to a threshold involves a frequency of occurrence threshold.

A POSITA would have also found it obvious to compare Murashita’s threshold with the frequency of occurrence for each symbol given that the frequency of occurrence is calculated, updated, and stored in Murashita’s system. To a POSITA, this comparison would be

straightforward to do as taught by Murashita. JX-0690 (Murashita) Fig. 9, 1:49–52, 7:18–39, 5:4–21.

Murashita also discloses a coding device (as illustrated in Figure 9) that includes a “threshold-value holding unit 108”. JX-0690 (Murashita) 7:17-23. “The threshold-value holding unit 108 stores a threshold value which is used in making a decision to stop the updating of the frequency, the cumulative frequency, and the context tree. The comparison unit 109 compares the threshold value stored in the threshold-value holding unit 108 with the cumulative frequency stored in the cumulative-frequency holding unit 103.” JX-0690 (Murashita) 7:39-49. Murashita discloses a flow chart of the operation of Figure 9’s coding device 21 that uses a threshold value. *Id.* 8:32-44; Fig. 10.

A POSITA would have understood that Murashita’s threshold is determined based on the expected frequency of occurrence of syntax elements in a bit stream for several reasons at least under Nokia’s interpretation of the claim. Murashita discloses that different threshold values according to the frequency of occurrence of syntax elements can be used. *Id.*, 12:12-23.

3) 8[b]: “categorizing a plurality of syntax elements ...;”

As explained in limitation 8[a], Marpe teaches determining a cut-off value (*threshold*) for use in the coding scheme, wherein adaptive context modeling is used for the most frequently observed bins, and for the less frequently observed bins, a static (equal) probability model is used based on the cut-off value. JX-0688 (Marpe) ¶¶ 16, 17, 48. Marpe further teaches that the categorized syntax elements are passed to the context modeler path or the bypass path of the encoder, as illustrated in stage 100b of Fig. 2. *See* JX-0688 (Marpe) ¶¶ 74-77. Marpe further explains the “regular coding mode” (context modeler path) and the “bypass coding mode” (bypass path) in Figure 2. *See* JX-0688 (Marpe) ¶ 119 (context modeling mode). JX-0688 (Marpe) ¶ 120 (bypass coding mode).



Combination with Murashita. For the reasons discussed above, it also would have been obvious to combine Marpe with Murashita. Murashita discloses that “controlling unit 13 controls the context holding/updating unit 12 to update the context data” and “[i]n doing so, the controlling unit 13 compares a predetermined threshold value with a cumulative frequency of occurrence for all the symbols registered under a given context.” JX-0690 (Murashita) 6:40-47; Fig. 7A. Murashita states “[t]hen, only when the cumulative frequency is *smaller than* the threshold value, the controlling unit 13 controls the context holding/updating unit 12 to update the context data for the given context.” *Id.* POSITAs would have understood comparing a cumulative frequency of symbol occurrences to a threshold involves a frequency of occurrence threshold.

Murashita also discloses a coding device that includes a “threshold-value holding unit 108”. JX-0690 (Murashita) 7:17-23. “The threshold-value holding unit 108 stores a threshold value which is used in making a decision to stop the updating of the frequency, the cumulative frequency, and the context tree. The comparison unit 109 compares the threshold value stored in the threshold-value holding unit 108 with the cumulative frequency stored in the cumulative-frequency holding unit 103.” JX-0690 (Murashita) 7:39-57; *see also* 8:11-19; Figs. 9, 10.

4) 8[c]: “entropy coding symbols that correspond to the first category of syntax elements and that have been subjected to a context update;”

Marpe and Murashita disclose entropy coding under all proposed constructions because both references disclose entropy encoding.

[REDACTED]

threshold value with a cumulative frequency of occurrence for all the symbols registered under a given context.” JX-0690 (Murashita) 6:40-47; Fig. 7A. Murashita further states that “[t]hen, only when the cumulative frequency is *smaller than* the threshold value, the controlling unit 13 controls the context holding/updating unit 12 to update the context data for the given context.” *Id.*; JX-0690 (Murashita) 7:39-57; *see also* 8:11-19, 8:35-48; Fig. 9.

5) 8[d]: “entropy coding symbols that correspond to the second category of syntax elements and that have bypassed context updating.”

Marpe and Murashita disclose entropy coding under all proposed constructions because both references disclose entropy encoding.

As explained above, Marpe’s Figure 1 discloses entropy coding symbols that correspond to syntax elements. Marpe discloses entropy coding symbols that correspond to the second category of syntax elements and that have bypassed context updating. The second category of syntax elements travels the “bypass coding mode” path through bypass coding engine (120).

Marpe states that the “function of switch 113 is to pass the bits or bins of the bin string at binarization stage output 108 to either the context modeler 112 or to a bypass coding input terminal 116 of stage 100c, thereby bypassing context modeler 112.” JX-0688 (Marpe) ¶¶ 44, 46. The bypass coding engine 120 is for binary arithmetically coding the bin values passed directly from binarization stage output 108 via switch 113 by use of a static predetermined probability distribution estimation and also outputs coded bits.” JX-0688 (Marpe) ¶ 50; *see also id.* at ¶ 51.

A POSITA would understand that in the proposed combination, Murashita’s “second category of syntax elements” would utilize Marpe’s entropy coder and bypass coding path. Murashita discloses that “controlling unit 13 controls the context holding/updating unit 12 to update the context data” and “[i]n doing so, the controlling unit 13 compares a predetermined threshold value with a cumulative frequency of occurrence for all the symbols registered under a

[REDACTED]

given context.” JX-0690 (Murashita) 6:40-47; Fig. 7A. Murashita further states that “[t]hen, only when the cumulative frequency is *smaller than* the threshold value, the controlling unit 13 controls the context holding/updating unit 12 to update the context data for the given context.” *Id.*; *see also* JX-0690 (Murashita) 7:39-57; *see also* 8:11-19, 8:35-48; Fig. 9.

c) Dependent Claim 13

Marpe in combination with Murashita teaches the additional limitation of claim 13 at least under Nokia’s interpretation of the claim limitation. Marpe discloses determining a cut-off value (*threshold*) for use in the probability-based binarization scheme, wherein adaptive context modeling is used for the most frequently observed bins, and for the less frequently observed bins (remaining bins), a static (equal) probability model is used based on the cut-off value. Marpe discloses that the cut-off value S (threshold) can be predefined as the value “9 in the case of motion vector differences and [value] 14 in the case of transform coefficient levels.” *Id.*, ¶ 89.

Murashita also discloses this additional limitation of claim 13. Murashita discloses that “controlling unit 13 controls the context holding/updating unit 12 to update the context data” and “[i]n doing so, the controlling unit 13 compares a predetermined threshold value with a cumulative frequency of occurrence for all the symbols registered under a given context.” JX-0690 (Murashita) 6:40-47; Fig. 7A.

2. Marpe in combination with Peacock

As Dr. Schonfeld will explain, a POSITA would have found Claims 1, 6, 8, and 13 of the ’701 patent (the “’701 Asserted Claims”) to be obvious based on the teachings of Marpe (as above) in combination with U.S. Patent No. 6,919,826 (“Peacock”) (JX-0687, RESP1448-00015367).

a) Motivation to Combine

A POSITA would have been motivated to combine the teachings of Marpe and Peacock to have a more efficient coder and would have had reasonable expectations of success doing so.

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CONFIDENTIAL SOURCE CODE INFORMATION—ATTORNEYS’ EYES ONLY***

Marpe and Peacock are both directed to increasing the efficiency of entropy coding, in which symbols occurring more frequently are preferably assigned to shorter codes. *See* JX-0687 (Peacock) at 8:20-22 (“Symbols which occur more frequently may be assigned codewords with a smaller numbers of bits.”); JX-0688 (Marpe) ¶ 10. Marpe and Peacock are analogous references to the ’701 patent because they are reasonably pertinent to the technical problem allegedly addressed by the claimed invention. Marpe and Peacock are also both directed to improving coding efficiency for overall better performance. *See* JX-0687 (Peacock) at 8:20-22, 1:38-41; JX-0688 (Marpe) ¶ 10, 3, 14, 16, 17.

Marpe and Peacock are analogous references as both are in the same field of video coding schemes. *See, e.g.*, JX-0688 (Marpe) ¶¶ 3, 10, 14, 16, 17; JX-0687 (Peacock) 1:7-10. Indeed, both references pertain to coding/decoding schemes based on known entropy coding methods. *Id.* Peacock is designed for “[t]he transfer of pixel data ... represent[ing] screen displays ... over a low-bandwidth network.” JX-0687 (Peacock) at 1:30-32. Peacock set out to address “a need for a data encoding algorithm to efficiently compress the pixel data during transmission between the server and the thin-client device.” *Id.* at 1:32-35; *see also id.* at 5:63-66 (similar); *id.* at 5:32-37. Bandwidth consideration in transmission is one reason motivating video compression technology. Thus, both Peacock and video compression (as recognized by Marpe) seek to improve the performance of video transmission over limited bandwidth to a device with limited computation power, e.g., a thin-client device. Indeed, Peacock teaches that its compression technique is applicable to “any data types in need of compression” including movies. JX-0687 (Peacock) at 6:4-7. Therefore, Peacock, like Marpe, is applicable to video compression.

A POSITA would have had a reasonable expectation of success in combining the teachings of Marpe and Peacock. It involves nothing more than applying a known technique to obtain a

[REDACTED]

predictable result based on an existing application of the technique. A POSITA would also have been motivated to combine Marpe and Peacock to provide a more efficient and compact encoding scheme by modifying Marpe's coding scheme to incorporate Peacock's determining a frequency of occurrence threshold feature and categorizing based on the frequency of occurrence threshold feature. A POSITA would have been motivated to incorporate Peacock's encoding module 310 into Marpe's CABAC engine. Indeed, a POSITA would have had a reasonable expectation of success in modifying Marpe's context modelling stage to include Peacock's features because Peacock is equipped to switch coding pathways to maximize entropy coding efficiency (e.g., context modeling/bypass coding in Marpe and explicit/implicit coding in Peacock). This would be straightforward for a POSITA to implement.

A POSITA would have also found Peacock's threshold features to be an obvious variation of Marpe's own use of thresholds as demonstrated by its teaching of probability intervals (as discussed in detail below). *See, e.g.*, JX-0688 (Marpe) ¶¶ 17, 48, 51, 73-77, 82-83. A POSITA would have also had a reasonable expectation of success in modifying Marpe to include Peacock's features because coding methods and systems, such as the ones disclosed in Marpe and Peacock, were well-known at the time of the '701 patent as explained above.

b) Independent Claim 8

1) 8[preamble]

This limitation is undisputed. As noted above, Marpe teaches the preamble limitation.

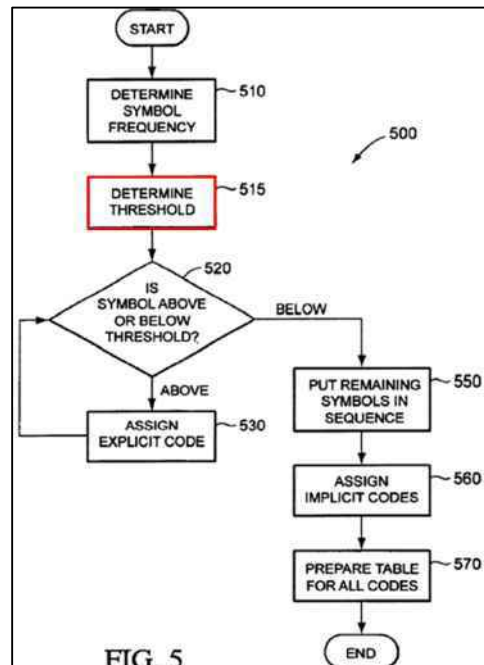
Peacock also discloses an embodiment with at least one processor and at least one memory including computer program code configured to cause the device to execute Peacock's scheme. JX-0687 (Peacock) at 6:8-16, Fig. 2. Specifically, Peacock's compression technique may be embodied in a program running on a thin-client device 110 or a server 120, *id.* at 6:8-13, both are computing systems comprising "a processor or central processing unit (CPU) 210 [and] a memory

220....” *Id.* at 6:57-66; *see id.* at 7:1-18; Fig. 3. Peacock’s program “may be stored in a computer-readable medium ... and executed ... by server 120 or thin-client device 110.” *Id.* at 7:39-43. The program may include an encoding and/or a decoding module. *Id.* at 7:43-48.

2) 8[a] – the determining step

As discussed above, Marpe teaches limitation 8[a] of the ’701 patent.

Combination with Peacock. It also would have been obvious to combine Marpe with Peacock to meet this limitation. Peacock discloses determining a frequency of occurrence threshold. *See* JX-0687 (Peacock) at Abstract, 4:56-65. The frequencies of occurrence of the symbols are determined first, followed by the determination of the threshold. *Id.* A POSITA would have understood this threshold is a frequency of occurrence threshold based on that sequence of steps. Peacock further confirms that “the threshold may be a frequency value” and that it is compared



with the frequencies of occurrence of symbols. *Id.* at 9:26-27, 5:39-42, 5:31-56; Fig. 5, 14:3-6 (“In step 515, a threshold value for switching from explicit to implicit encoding can be determined. **Methods of determining the threshold** have been discussed above and include determining the threshold based on symbol frequency....” (emphasis added)), 13:47-55, 14:3-17.

This threshold is determined based on an expected frequency of occurrence of symbols. Peacock teaches first determining the frequencies of occurrence of symbols. *See id.* at Fig. 5 (step 510); *see also* 7:60-8:47, 9:22-10:58, Table 7. Peacock further teaches that “[i]n some embodiments, the frequency of occurrence may be determined using [1] estimated probabilities for a symbol or [2] a specific analysis of the file.” *Id.* at 13:52-54. The [2] specific analysis of the



file is to analyze the frequencies of occurrence of various symbols in an existing, complete file from which the frequencies of occurrence may be determined by simply counting the number of times each symbol appears and dividing individual counts by the total number of symbols. *See id.* at 1:36-2:36. In contrast, a POSITA would have understood that the [1] estimated probabilities for a symbol measures the expected probabilities of symbols as the they pass through the system--in a stream of symbols. The expected symbols probabilities in such a stream are estimated because the system does not know future symbols.

Relatedly, a stream of digital symbols is equivalent to a bit stream, e.g., when the symbols are encoded into a string of zeros and ones. *See id.* at 4:9-13. Further, a file analyzed under method [1] is also a symbol stream or a string of symbols. *Id.* at 1:40-47, 5:32-37. And the bit stream may represent a video. Peacock illustrates its embodiment using a flow chart “of a method of encoding 500 a file of symbols.” *Id.* at 13:47-49. “[A] screen of pixel data” is an example of such a file of symbols. *Id.* at 5:34-35. Further, Peacock’s invention is designed for a computing environment involving “[t]he transfer of pixel data ... represent[ing] screen displays ... over a low-bandwidth network.” *Id.* at 1:30-32; see also *id.* at 1:32-35, 5:63-66 (similar), 5:32-37. Thus, Peacock’s teaching can be applied to video coding system like Marpe.

3) 8[b] – the categorizing step

As discussed above, Marpe teaches limitation 8[b] of the ’701 patent.

Combination with Peacock. It also would have been obvious to combine Marpe with Peacock to meet this limitation. As explained in limitation 8[a], Peacock discloses determining a frequency of occurrence threshold including by estimating the probabilities of symbols in a bit stream. *Id.* It categorizes the symbols based on their frequencies of occurrence, assigning those that occur with a higher frequency than the threshold to one category and assigning the remaining symbols to another category. Peacock at 5:34-42, 4:56-65, 9:22-10:58, 11:33-47, 12:57-67, 14:39-

15:17, Tables 1, 5, 7, and 10, Fig. 5 (right).

Peacock's scheme categorizes a plurality of symbols, as the iterative loop in Figure 5 indicates. *See id.* at 14:52-55. Peacock's scheme is applicable to syntax elements of video content as noted above.

4) 8[c] – coding the first category step

Marpe and Peacock disclose entropy coding under all proposed constructions because both references disclose entropy encoding. As discussed above, Marpe teaches limitation 8[c] of the '701 patent. Marpe's encoder would perform the entropy coding the in proposed Marpe/Peacock combination. A POSITA would have understood that Peacock's "first category of syntax elements" would utilize Marpe's entropy coder and context modeler path.

5) 8[d] – coding the second category step

Marpe and Peacock disclose entropy coding under all proposed constructions because both references disclose entropy encoding. As discussed above, Marpe teaches limitation 8[d] of the '701 patent. Marpe's encoder would perform the entropy coding the in proposed Marpe/Peacock combination. A POSITA would have understood that Peacock's "secondary category of syntax elements" would utilize Marpe's entropy coder and bypass coding path to improve the efficiency of entropy coding.

c) Dependent claim 13

As discussed above, Marpe teaches the limitation of claim 13 of the '701 patent.

Combination with Peacock. It also would have been obvious to combine Marpe with Peacock to meet this limitation. Peacock discloses determining a frequency of occurrence threshold. *See* Peacock at Abstract. The frequencies of occurrence of the symbols are determined first, followed by the determination of the threshold. *Id.* Peacock further confirms that understanding by disclosing that "the threshold may be a frequency value" and that it is compared

[REDACTED]

with the frequencies of occurrence of symbols. *Id.* at 9:26-27, 5:39-42, Fig. 5; *see also id.* at 14:3-6 (“In step 515, a threshold value for switching from explicit to implicit encoding can be determined. Methods of determining the threshold have been discussed above and include determining the threshold based on symbol frequency....”).

Therefore, for the reasons explained above, a POSITA would have understood that both Marpe and Peacock disclose this additional limitation of claim 13 at least under Nokia’s interpretation of the claim limitation.

3. Secondary Considerations

No evidence of secondary considerations of non-obviousness exists for the ’701 patent.

No Evidence of Commercial Success Tied to the ’701 Patent. No evidence exists linking the sales of Respondents’ products, licenses to Nokia patent portfolio, or alleged widespread adoption of H.265 to the alleged invention of the ’701 patent. Respondents products do not practice the claims of the ’701 patent, so the commercial success of Respondents’ products cannot be attributed to the ’701 patent. For licenses, Nokia has not identified any license that was entered into particularly because of the ’701 patent. Nokia’s inventors admitted that standards like H.264 and H.265 are built upon prior art technologies and encompass hundreds of technical contributions further confirming that any success of these standards is attributable to features other than those allegedly in the ’701 patent. *See* JX-0181C (Lainema 1380 Depo. Tr.) at 87-89; RX-1943C (Hallapuro Depo. Tr.).

No Long-Felt But Unmet Needs Exists Tied to the ’701 Patent. Nokia alleged two IEEE publications reflect long-felt need: JX-0675 (NOK1448_00233484); JX-0674 (NOK1448_00233097). Yet these articles fail to express any “long-felt” need in the industry that is addressed by the ’701 patent.

[REDACTED]

Nokia failed to offer any evidence of the following secondary considerations: Skepticism, Unexpected Results, Failed Attempts of Others, or Copying Tied to the Patented Invention; Industry Recognition or Praise Tied to the Patented Invention.

4. Invalidity Under § 112 – No Written Description or Enablement

Complainant’s interpretation of the claims for purposes of infringement lacks written description support. Nokia’s interprets the limitation “determining a frequency of occurrence threshold based on an expected frequency of occurrence of syntax elements in a bit stream” of claims 1 and 8 to allow for the selection of a fixed value that is not related to the video content of the bitstream being processes.

Nokia also interprets the limitation “categorizing a plurality of syntax elements ...” of claims 1 and 8 to mean that any particular syntax is always categorized into the same category regardless of its relationship to the frequency of occurrence threshold. Nokia contends that coeff_abs_level_greater1_flag is always categorized within the first category, and thus, always entropy coded using context updating, but coeff_abs_level_remaining is always categorized within the second category by the standard and is always bypass encoded. The specification of the ’701 patent lacks any disclosure corresponding to Nokia’s interpretation.

Nokia interprets the “categorizing a plurality of syntax elements” limitation of claims 1 and 8 to allow for categorizing syntax elements into categories regardless of the frequency of occurrence. For example, Nokia appears to contend that a syntax element coeff_abs_level_remaining corresponds to the second category of syntax elements, and regardless of whether its frequency of occurrence is greater than or less than the asserted threshold, it is always bypass encoded. *See, e.g.*, JX-0137 at § 9.3.4.2. The specification for the ’701 patent lacks any written description support for the claim interpretation.

VI. U.S. PATENT NO. 10,536,714

A. Claim Construction

The parties' positions are set forth in the parties' Joint Chart Setting Forth Post-Hearing Claim Constructions. In particular, Respondents proposed that "first spatial motion vector prediction candidate" means "the spatial motion vector prediction candidate that is first for processing." This is supported by Complainants' own words: in distinguishing Nakamura in Complainants' response to an IPR petition, Complainants argued that the "first SMVP candidate" was the first *in an order for processing*. Specifically, Complainants argued, "Petitioner *claims that S1 is the first spatial motion vector prediction candidate*, even though Nakamura discloses that *S1 is derived after S0*, as shown in the figure below, which illustrates *the processing or check order (arrow) that generates S0 (the first candidate) followed by S1 (the second candidate)*." RX-2482 (IPR2024-00604 POPR) at 60 (emphasis added).

B. Infringement

As set forth below, the evidence establishes that Respondents do not infringe the asserted claims of the '714 patent.

1. Nokia's Citations to Standards and Testing Evidence Do Not Demonstrate Infringement

a) The Accused Products Do Not Select a First SMVPC

Claims 1, 9, 15, and 23 of the '714 patent require that an encoder or decoder "select[] a first spatial motion vector prediction candidate." JX-0004 ('714 Pat.). Neither the accused encoders nor decoders of the Accused Products select a first spatial motion vector prediction candidate ("SMVPC").

First, under Respondents’ proposed construction, there is no dispute that the Accused Products do not satisfy the requirement of “selecting a first SMVPC.” Respondents construe “first SMVPC” to mean “the spatial motion vector prediction candidate that is first for processing.”

Under the H.265 standard, the A1 candidate is the first candidate processed. JX-0137 (H.265 Standard) at 8.5.3.2.3. Critically, however, A1—if available—is added directly to the motion vector prediction list without being compared against any other candidate and without being used to determine a subset of candidates. JX-0137 (H.265 Standard) at 8.5.3.2.3. Nokia’s expert expressly acknowledges that the candidate at location A1 “is not compared with another candidate before being added to the merge list,” which forecloses infringement under Respondents’ construction. Further, because under the H.265 standard, no “subset” is ever “determined” for A1, the Accused Products cannot satisfy the asserted limitation.

Second, Nokia’s infringement theory improperly collapses distinct claim steps and mischaracterizes how candidates are processed under the H.265 standard. Nokia’s expert equates “selecting” a first SMVPC with computing availability flags and performing downstream determinations, but the asserted claims separately recite “selecting,” “determining a subset,” and “comparing,” and nothing in the claim language or specification supports rewriting “selecting” to include those additional steps. The ’714 patent instead equates selection with processing order. JX-0004 (’714 Pat.), 22:17-24. The specification confirms that selection refers to which candidate is taken up first, not whether it is later compared or added to a list. Consistent with this disclosure, H.265 processes candidates in a strictly ordered process—A1, B1, B0, A0, and finally B2—not in parallel or in any order. JX-0137 (H.265 Standard) at 8.5.3.2.3. For instance, B2 must check if the other four candidates—A1, B1, B0, and A0—have already been added to the merge list, and therefore must be processed last. JX-0137 (H.265 Standard) at 8.5.3.2.3.

[REDACTED]

Third, Nokia’s expert further asserts that A1 cannot be the first SMVPC and that, for most blocks, B2 would instead be first because it appears earlier in scan order. Under the H.265 standard, A1 is processed first *for purposes of determining whether it may be included in the motion vector prediction list*. JX-0137 (H.265 Standard) at 8.5.3.2.3. Any checks applied to A1 as part of that evaluation initiate its processing and therefore constitute selection within the meaning of the claim. As Dr. Hemami will explain, no reasonable POSITA would seek to compare candidates in scan order. No POSITA would select spatial candidates based on block scan order, which bears no relationship to motion correlation or coding efficiency.

b) The Accused Products Do Not Determine a Subset Based on the Location of the First SMVPC

Claims 1, 9, 15, and 23 of the ’714 patent require that an encoder or decoder “determin[e] a subset of SMVPCs based on the location of the block associated with the first SMVPC.” JX-0004 (’714 Pat.). Neither the accused encoders nor decoders of the Accused Products determine a subset based on the location of the first SMVPC.

First, to establish infringement, Nokia must show that the Accused Products perform a determination step in which location information for the first SMVPC is used as an input to select a subset of candidates. Under the H.265 standard, the processes governing candidate comparison does not consider location information when determining which candidates are compared to one another. JX-0137 (H.265 Standard) at 8.5.3.2.3. No relevant section inputs or evaluates the location of a candidate to dynamically select a subset of SMVPCs. JX-0137 (H.265 Standard) 6.4.2, 8.5.3.2.3. Because the H.265 standard lacks any mechanism that uses the location of the first SMVPC to determine a subset of candidates, the accused encoders and decoders cannot satisfy this limitation.

Second, the H.265 standard does not require an encoder or decoder to determine a subset of SMVPCs at runtime. Instead, the identity of which candidates are compared to which others was fixed by the authors of the standard itself. Critically—the subsets Nokia identifies—such as {A1}, {B1}, {A1}, and {A1, B1}—are not dynamically determined *by any Accused Product*, but are hard-coded into the standard’s predefined comparison logic. JX-0137 (H.265 Standard) at 6.4.2, 8.5.3.2.3.

Nokia’s expert nevertheless asserts that a subset is “determined” whenever a particular candidate is selected. That assertion is internally inconsistent with his earlier statement that the “determining a subset ...’ ... must be started only after the ‘selecting ... to be included’ step is completed.” Those positions cannot be reconciled. More fundamentally, neither the H.265 standard nor the Accused Products perform any operation that determines a subset of SMVPCs based on the location of the first SMVPC. All comparisons are predefined and executed only if the relevant neighboring block exists. No comparison logic is conditioned on the location of the first SMVPC—or any SMVPC at all—foreclosing infringement of this limitation.

Third, even assuming arguendo that a subset is determined at all, it is not determined “based on the *location* of the block *associated with the first SMVPC*,” as the claims require. In Investigation No. 337-TA-1380, the parties disputed which “block” this claim limitation referred to: “the encoded block currently being decoded,” which would be block 900 in Figure 9 of the ’714 patent, or as

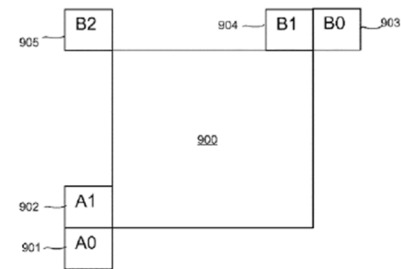
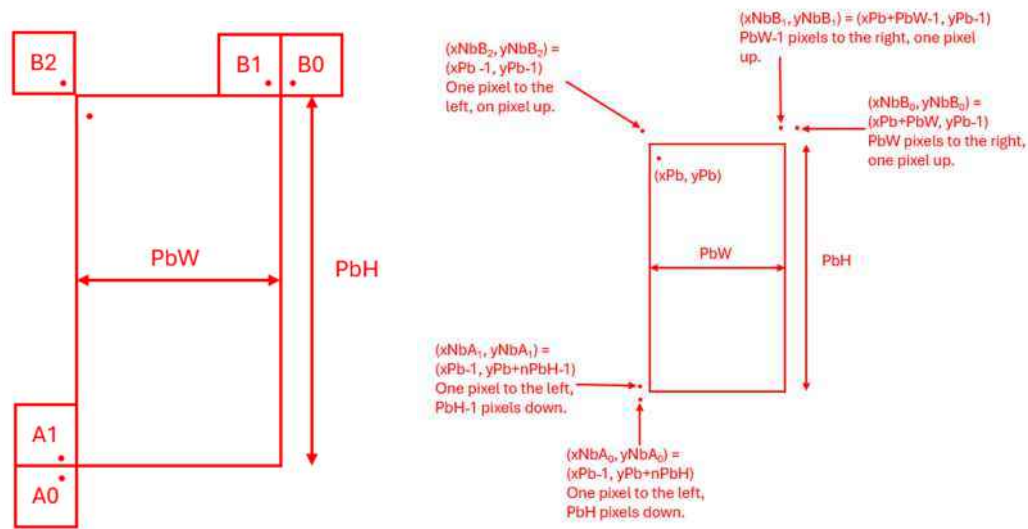


Fig. 9

Nokia argued, the block associated with the first SMVPC, e.g., A1. RX-0466 (337-TA-1380 Initial Determination) at 90-91. ALJ Elliot ultimately sided with Nokia. This distinction is crucial: to the

extent any subset exists, it is identified based on the location of the current block 900, **not** the first SMVPC.

Consider, for example, Nokia's claim that when A_0 is the first SMVPC, the subset is $\{A_1\}$. Below, $\{A_1\}$ is shown in the figure to the left as the block left-adjacent of the current block, corresponding with its position in Figure 9 of the '714 patent. The figure to the right shows how $\{A_1\}$ is defined under the H.265 standard: the block containing pixel location $(xNbA_1, yNbA_1)$. JX-0137 (H.265 Standard) at 8.5.3.2.3.



The subset $\{A_1\}$ is determined based on the equation:

$$(xNbA_1, yNbA_1) = (xPb-1, yPb+nPbH-1)$$

xPb refers to x coordinate of the block currently being encoded or decoded (i.e., block 900 in Figure 9 of the '714 patent). Dr. Hemami will explain that " $xPb-1$ " thus is the pixel to the left of the block currently being encoded or decoded, corresponding with A1 in Figure 9 of the '714 patent. Similarly, yPb refers to the y coordinate of the block currently being encoded or decoded. Thus, " $yPb+nPbH-1$ " refers to the y coordinate of the A1 block ($nPbH$ is the height of the block currently being encoded or decoded). In all instances, the purported "subset" is defined based on

[REDACTED]

the location of the *block currently being encoded or decoded*, not based on the location of *the first SMVPC*.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Nokia claims that the subset is determined based on the first SMVPC, but that is not enough: the claims require that the subset is determined based on the *location of* the first SMVPC. JX-0004 ('714 Pat.). Nokia's theory reads "location of" out of the claims. The only input to calculating the subset is the location of the current block, not the location of the first SMVPC.

c) Remaining Limitations Not Satisfied

For at least the reasons discussed above, the Accused Products do not satisfy the remaining claim limitations requiring comparing, determining to include or exclude, or selecting a SMVPC. Because the Accused Products do not select a "first SMVPC" or determine a "subset" within the meaning of the claims, there can be no comparison between a first SMVPC and another candidate, no determination to include or exclude a first SMVPC based on such a comparison, and no selection of a SMVPC as required by the asserted claims.

d) Complainants' Decoding Testing Does Not Evidence Steps Taken by Encoder

Claims 1 and 15 are encoding claims, but Nokia's case rests largely on VQ Analyzer screenshots that visualize a completed bitstream. VQ Analyzer can display decoder-visible results—syntax elements, motion vectors, indices, and partitioning—but it cannot reveal the encoder's internal decision-making that the claims require (e.g., selecting a "first" SMVPC from a defined set, determining a subset "based on" a particular block's location, performing less-than-

[REDACTED]

all-pairs comparisons, and signaling the chosen candidate). Observing an H.265-compliant end state does not prove the accused encoder executed the claimed sequence of steps to arrive there.

Nokia offered substantially the same argument in Investigation No. 337-TA-1380. RX-0466 (337-TA-1380 Initial Determination) at 82. There, Nokia’s VQ Analyzer–based theory was rejected because screenshots did not show “the heart of the invention”—exclusion through comparisons of less than all candidates. RX-0466 (337-TA-1380 Initial Determination) at 83-85. Dr. Moulin repeats the same output-to-input inference here, without encoder-side evidence (code, logs, traces, or documentation) tying any accused encoder to the claimed steps.

Dr. Hemami also disputes Nokia’s allegations of standard essentiality for the ’714 patent and will further explain that the ’714 patent provided little value to H.265 in light of the prior art that she analyzed. Dr. Hemami will also explain that if the ALJ were to determine that any of Nokia’s asserted decoding claims of the ’714 patent were essential to H.265, then a similar determination should also apply to the asserted encoding claims of the ’714 patent (including encoders that use and implement merge mode and similar processes), given that Nokia declared the ’714 patent family to be essential (RX-2248) and the similarity between its encoding and decoding disclosures. *compare* JX-0097 (’714 patent) at Figs. 5a and 5b, 15:15-16:55 *with id.* at Figs. 8a and 8b, 22:16-23:64; *id.* at 22:16-22, 2:4-11.

2. Nokia’s Source Code Analysis Does Not Show Infringement

Nokia’s source-code theories fail for multiple independent reasons, including its reliance on undifferentiated vendor code that is not properly mapped to the asserted claim limitations and its improper attempt to substitute RTL and Verilog design materials for the computer program code required by the asserted apparatus claims.

First, Nokia’s vendor-code case fails for the same basic reason as its standards and VQ Analyzer theories: it does not tie specific evidence to specific claim requirements. Dr. Moulin

[REDACTED]

largely bulk-cites disparate excerpts of vendor source code and then asserts, without a walk-through, that the cited material satisfies the asserted limitations. He typically does not identify the particular functions or parameters that supposedly perform the claimed steps. Instead, he highlights scattered equality checks and jumps to conclusions, leaving an analytical gap that cannot carry Nokia's burden. [REDACTED]

[REDACTED] Preset comparisons are not a “determination” of a subset, much less a subset determined “based on” the location of the block associated with the first SMVPC. Complainants also rely on their expert's unsupported “representativeness” allegations—asserting that vendor code is representative of the accused products without explaining why, and without establishing that the cited code is actually used in the chipsets shipped in the Accused Products. Complainants' assessment of vendor source code is wholly inadequate to evidence infringement.

Second, the asserted apparatus claims (claims 15 and 23) require “a processor and a memory including computer program code, the memory and the computer program code configured to, with the processor, *cause the apparatus to*” perform the recited operations. JX-0004 ('714 Pat.) (emphasis added). A POSITA would understand this limitation to require software (computer program code stored in memory) that, together with the processor, causes the device to carry out the claimed encoding/decoding steps. Nokia, however, does not identify any accused-product software—any specific executable, driver, firmware routine, function, or parameter stored in the Accused Products' memory—that performs the claimed “first SMVPC,” “subset,” and comparison operations.

Instead, Nokia's proof largely relies on RTL/Verilog materials from third-party chipset vendors (Intel, AMD, NVIDIA, Qualcomm, Amlogic, MediaTek) and similar hardware-



description artifacts. But RTL/Verilog is design-time code used to specify and synthesize hardware. Once a chipset is fabricated, that RTL/Verilog does not reside on the chip, is not stored in product memory as “computer program code,” and plays no operational role at runtime. Nokia’s fallback references to generic “drivers” or Task Manager screenshots do not cure the defect: Nokia still does not identify any concrete software component that performs the claimed steps. Because Nokia’s theory locates the relevant operations in hardware rather than memory-resident program code, the asserted apparatus claims are not infringed.

C. Technical Domestic Industry

Nokia’s allegations and evidence regarding why the technical prong of the domestic industry requirement are practiced by the DI products are identical to its infringement allegations. Indeed, Nokia relies on the same parts of the H.265 standard and analyzes the same source code from some of the same chip makers. Thus, Nokia has failed to meet the technical prong of the domestic industry requirement for the same reasons as set forth above with respect to infringement.

D. Invalidity

The four asserted claims largely overlap, each reciting the same five-step process. Substantively, the claims differ in two material respects: First, claims 1 and 9 are method claims, while claims 15 and 23 are apparatus claims. Second, claims 1 and 15 are directed to encoding, whereas claims 9 and 23 are directed to decoding. The former distinction is reflected in the claims’ preambles; the latter is reflected in the fifth step: the encoder claims recite a “transmit” step, while the decoder claims recite a “receive” step.

		Coding Type	
		Encoder	Decoder
Claim Type	Method	cl. 1	cl. 9
	Apparatus	cl. 15	cl. 23

These differences do not significantly affect the invalidity analysis, and the corresponding limitations of the four independent claims are therefore addressed collectively below, wherein any particular differences are addressed.²

1. Fujibayashi in combination with WD4

A POSITA would have found claims 1, 9, 15, and 23 of the '714 patent to be obvious based on the teachings of JCTVC-F231 ("Fujibayashi") (RX-1965) in combination with JCTVC-F803_d1 ("WD4") (RX-1993).

a) Public Accessibility

Fujibayashi and WD4 were publicly accessible before the '714 patent's November 4, 2011 provisional filing, as confirmed by Frank Bossen's declaration regarding Fujibayashi and WD4 specifically, and by inventor Jani Lainema's testimony that proposals to the H.265 standard were publicly available during the relevant period, rendering these references prior art under at least

² In a co-pending inter partes review, IPR2025-01153, Respondent ASUS has entered a stipulation. To abide by the stipulation, ASUS is not pursuing in this Investigation the specific grounds asserted in inter partes review in IPR2025-01153, or any other ground that could have been reasonably raised in IPR2025-01153 (i.e., any ground that could have been raised under §§ 102 or 103 on the basis of prior art patents or printed publications). ASUS also is not pursuing in this Investigation combinations of the prior art asserted in IPR2025-01153 with unpublished system prior art (or any other type of prior art). Accordingly, the § 103 invalidity grounds asserted herein against the '714 patent are advanced solely by Respondent Acer and not by ASUS.

pre-AIA § 102(a). RX-1995 (Bossen Decl.) ¶¶38-41; RX-2686 (8/21/2025 J. Lainema Dep. Tr.) at 108:03-110:16.

b) Motivation to Combine

A POSITA would be motivated to combine Fujibayashi with WD4 to reduce computational complexity, as WD4's merge-mode process can require up to ten candidate comparisons, whereas Fujibayashi's approach uses a shorter candidate list that substantially reduces the number of required comparisons. RX-1965 (Fujibayashi) at 2; RX-1993 (WD4) § 8.4.2.1.1. Even though Fujibayashi predates WD4's merge mode, a POSITA would recognize that applying Fujibayashi's spatial candidate selection strategy to WD4 would improve efficiency while preserving prediction quality, given the high correlation of motion information among neighboring blocks.

Analogous Prior Art. Fujibayashi and WD4 are analogous prior art because both squarely address HEVC video encoding and decoding—specifically motion vector prediction, candidate derivation, and decoder-side processing—and would have been viewed by a POSITA as pertinent to the same problems addressed by the '714 patent. RX-1965 (Fujibayashi) at 1-2; RX-1993 (WD4) § 7, 8.4.

Predictable Results. Combining both references would have yielded predictable results because they pursue the same goal of improving HEVC coding efficiency, and a POSITA would expect that applying Fujibayashi's simplified spatial candidate selection—already shown to reduce comparisons while preserving predictor quality—within WD4's HEVC framework would produce the anticipated reduction in complexity without adverse effects. RX-1965 (Fujibayashi) at 1-5; RX-1993 (WD4) § Abstract, 0.1.

Complementary References. WD4 provides the HEVC framework—including terminology, syntax, decoding procedures, and candidate-comparison techniques—while Fujibayashi supplies focused improvements for simplifying motion vector prediction, such that a

POSITA would naturally consult each reference to implement the other and integrate efficiency-oriented refinements within the WD4 architecture. RX-1965 (Fujibayashi) at 1; RX-1993 (WD4) §§ 3, 8.

Principle of Operation Unchanged. Combining Fujibayashi with WD4 would not alter the principle of operation of either reference, because both are directed to block-based motion prediction in HEVC and applying Fujibayashi's simplified candidate-selection techniques within WD4 preserves the same purpose, inputs, and outputs for motion vector prediction. RX-1965 (Fujibayashi) at 1, 3-5; RX-1993 (WD4).

Reasonable Expectation of Success. A POSITA would have reasonably expected success in combining Fujibayashi with WD4 because Fujibayashi discloses tested, HEVC-directed improvements to block-based motion vector comparisons—demonstrating minimal performance loss, reduced complexity, and successful experimental results in HM0.9—and expressly recommends adoption into the HEVC working draft. RX-1965 (Fujibayashi) at 1, 3-5; RX-1993 (WD4).

POSITA Capability. Given standard practice within the JCT-VC, a POSITA would have been fully capable of applying Fujibayashi's simplified motion vector prediction techniques within the HEVC framework described by WD4—or consulting WD4 to integrate Fujibayashi's proposal—particularly where Fujibayashi was expressly directed to improving implementation and demonstrated reduced complexity with essentially no performance loss. RX-1965 (Fujibayashi) at 1; RX-1993 (WD4).

c) [1pre]/[9pre]/[15pre]/[23pre] – Preambles

Complainants do not dispute that the preambles are met by Fujibayashi in combination with WD4.



The preambles of claims 1 and 9 recite: “a method comprising.” Fujibayashi discloses a method that is a “CE9 3.2d Simplified Motion vector prediction.” RX-1965 (Fujibayashi) at 1.

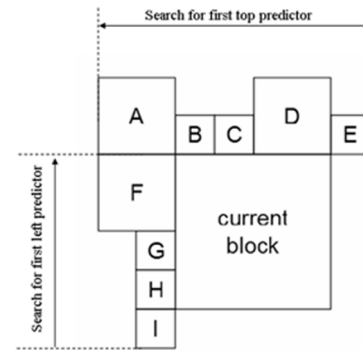
The preambles of claims 15 and 23 recite “An apparatus comprising a processor and a memory including computer program code, the memory and the computer program code configured to, with the processor, cause the apparatus to.” Each of these preambles are met by (or rendered obvious by) Fujibayashi in combination with WD4 by describing software-implemented video encoding and decoding performed on conventional computing hardware, i.e., a processor executing computer program code stored in memory to carry out the claimed operations, as would have been understood by a POSITA. RX-1965 (Fujibayashi) at 3-4; RX-1993 (WD4) § Annex A.

d) [1a]/[9a]/[15a]/[23a] – Selecting Step

Complainants do not dispute that the selecting step is met by Fujibayashi in combination with WD4.

Claims 1, 9, 15, and 23 of the ’714 patent require “[select/selecting] a first [SMVPC] from a set of [SMVPCs] for [a block/an encoded block] of pixels as a potential [SMVPC] to be included in a motion vector prediction list for a prediction unit of [the block/the encoded block] of pixels, where the motion vector prediction list comprises motion information of the [SMVPCs] [and is utilized to identify motion vector prediction candidates of which one spatial motion vector prediction candidate from the motion vector prediction list is signaled as the motion information for the prediction unit.]” As discussed above, the parties have offered differing constructions for the claim term “first spatial motion vector prediction candidate.”

Fujibayashi discloses selecting a first SMVPC from a defined set of candidates and therefore teaches the “selecting a first SMVPC” step. RX-1965 (Fujibayashi) at 2. Fujibayashi forms a list of motion vector prediction candidates from neighboring blocks and reduces that list to up to three predictors—left, top, and collocated. RX-1965 (Fujibayashi) at 2. In Fujibayashi’s Figure 1 (right), the set includes blocks A–I. RX-1965 (Fujibayashi) at 2. If available, Fujibayashi selects as the top predictor the first SMVPC candidate E. RX-1965 (Fujibayashi) at 2.



Complainants argue that the specific text of Fujibayashi describes, in linear order, determining the left predictor (F, G, H, or I) before the top predictor (A, B, C, D, or E). However, as Dr. Hemami will explain, a POSITA would understand that the disclosed processing order is not rigid and that the top predictor (i.e., the first SMVPC) could just as readily be selected before determining the left predictor (i.e., the subset) without changing the resulting list or comparison behavior. Accordingly, Fujibayashi teaches selecting a first SMVPC from a set of spatial motion vector prediction candidates, and it would have been obvious to implement that selection as the first step in the claimed process.

e) [1b]/[9b]/[15b]/[23b] – Determining a Subset Step

Claims 1, 9, 15, and 23 of the '714 patent require “[determine/determining] a subset of [SMVPCs] based on the location of the block associated with the first [SMVPC].” Fujibayashi teaches determining a subset based on the location the first SMVPC.

In Fujibayashi, the first spatial candidate selected is E (if available), a “top predictor” located above the current block. RX-1965 (Fujibayashi) at 2. Because E is a top neighbor, Fujibayashi determines the subset SMVPC from the left side of the current block, selecting the first available left-side motion vector from a defined group of left neighbors. RX-1965

[REDACTED]

(Fujibayashi) at 2. Thus, the relevant subset for comparison is drawn from the left-neighbor candidates.

Complainants contend that this subset is determined solely based on availability rather than the location of the first SMVPC. That argument mischaracterizes Fujibayashi's process. Because the first SMVPC (i.e., E) is located on the top of the current block, Fujibayashi looks to the left neighbors for the subset SMVPC, thereby determining the subset based on the location of the first SMVPC. RX-1965 (Fujibayashi) at 2. A POSITA would understand that this location-driven selection of left-versus-top candidates satisfies the claimed requirement of determining a subset based on the location of the block associated with the first SMVPC. RX-1965 (Fujibayashi) at 2.

f) [1c]/[9c]/[15c]/[23c] – Comparing Step

Claims 1, 9, 15, and 23 of the '714 patent require "[compare/comparing] motion information of the first [SMVPC] with motion information of [the/another] [SMVPC] in the [determined subset/set] of [SMVPCs] without making a comparison of each possible candidate pair from the set of [SMVPCs]." WD4 provides a basic framework for the compare operation: comparing, for example, A0 to B1 in the case of a horizontal partition (2NxN), or comparing A0 to A1 in the case of a vertical partition (Nx2N). RX-1993 (WD4) §§ 8.4.2.1.1. WD4's compare operation alone is non-exhaustive and satisfies the claimed compare step. Fujibayashi improves on this technique, teaching the claimed comparison step by comparing the motion information of the first SMVPC to the motion information of an SMVPC in a determined subset, without exhaustively comparing all possible candidate pairs. As discussed above, Fujibayashi's set of spatial motion vector prediction candidates includes multiple neighboring blocks (I, H, G, F, E, D, C, B, A). RX-1965 (Fujibayashi) at 2, Fig. 1. After selecting E as the first SMVPC, Fujibayashi compares the motion information of E only to the left predictor, and not to every candidate in the set. RX-1965 (Fujibayashi) at 2. Specifically, Fujibayashi explains that if the motion vector of one



predictor is identical to that of the other, it is deemed unavailable and the search continues, which necessarily entails a comparison between E and the left predictor. RX-1965 (Fujibayashi) at 2, Fig. 1.

Complainants argue that because the only two predictors (top, left) are compared, the comparison is exhaustive. That argument incorrectly defines the relevant “set.” The proper set is the full group of spatial candidates disclosed by Fujibayashi, not merely the two candidates ultimately compared. RX-1965 (Fujibayashi) at 2, Fig. 1. Comparing E to only the left predictor—rather than to all candidates in the set—satisfies the requirement of avoiding comparisons of each possible candidate pair. Moreover, Complainants’ position is internally inconsistent with their infringement theory, which likewise treats the set as including all neighboring candidates while relying on a single comparison to satisfy the claim.

g) [1d]/[9d]/[15d]/[23d] – Determining to Include or Exclude Step

Complainants do not dispute that the determining to include or exclude step is met by Fujibayashi in combination with WD4.

Claims 1, 9, 15, and 23 of the ’714 patent require “[determine/determining] to include or exclude the first [SMVPC] in the motion vector prediction list based on [the comparing/comparison of the motion information of the first [SMVPC] with motion information of the [SMVPC]].” Fujibayashi teaches determining whether to include or exclude the first SMVPC based on the comparison. Fujibayashi explains that the top predictor E is excluded if its motion vector is identical to the left predictor, and if not excluded, E is added to the list of candidates. RX-1965 (Fujibayashi) at 2. Thus, inclusion or exclusion of the first SMVPC is expressly determined based on the comparison outcome. RX-1965 (Fujibayashi) at 2.

h) [1e]/[9e]/[15e]/[23e] – Transmit/Receive Step

Complainants do not dispute that the transmit/receive steps are met by Fujibayashi in combination with WD4.

Claims 1 and 15, directed at encoders, recite “[cause/causing] information identifying the one [SMVPC] from the motion vector prediction list to be transmitted to a decoder or to be stored.” Fujibayashi and WD4 teach the final transmit limitation. WD4 defines a syntax element, `merge_idx`, that identifies the selected candidate from the merge list for each prediction unit and is written into the bitstream when merge mode is used. RX-1993 (WD4) § 7.4.7, 8.4.2.1.1. That index is transmitted to, or stored for, the decoder, which parses `merge_idx` and applies the corresponding candidate, as a POSITA would understand in conventional HEVC operation. RX-1993 (WD4) § 0.2, 3.11, 3.12, 3.34, 3.38, 7.3.7, 7.4.7, 8.4.2.1.1.

Claims 9 and 23, directed at decoders, recite “[select/selecting] a spatial motion vector prediction candidate from the motion vector prediction list for use in decoding the encoded block of pixels, wherein the spatial motion vector prediction candidate is selected from the motion vector prediction list using information that was received identifying a respective spatial motion vector prediction candidate from the motion vector prediction list constructed by an encoder.” Fujibayashi and WD4 disclose the decoder-side receive limitation. WD4 teaches that the encoder constructs a motion vector prediction list (`mergeCandList`) and signals, via the syntax element `merge_idx`, which spatial motion vector prediction candidate was selected. RX-1993 (WD4) § 7.4.7, 8.4.2.1.1. During decoding, the decoder receives `merge_idx` from the encoded bitstream and uses it to select the corresponding candidate from `mergeCandList` for motion prediction of the current block, including its motion vectors, reference indices, and prediction flags, as a POSITA would understand in conventional HEVC decoding. RX-1993 (WD4) § 0.2, 3.11, 3.12, 3.34, 3.38, 7.3.7, 7.4.7, 8.4.2.1.1.

2. Rusert in combination with Karczewicz

The combination of “Rusert” (RX-1976, U.S. Patent App. Pub. No. 2011/0194609) and “Karczewicz 721” (RX-1977, U.S. Patent App. Pub. No. 2011/0249721) renders obvious the asserted ’714 Patent claims.³ Rusert teaches selecting Prediction Motion Vector (“PMV”) candidates for motion vector prediction in video encoding and decoding. RX-1976 at ¶¶ 12-13, 35-37, 70-73, 88-99. Karczewicz 721 teaches techniques for encoding and decoding related to the “emerging HEVC standard,” which became H.265. RX-1977 at Abstract, ¶¶ 32-35, 59. The combination pairs Rusert’s building of a motion vector prediction list (“PMV_CANDS”) and signaling of a chosen candidate with the “prediction units” (“PUs”) of the emerging HEVC standard, as taught by Karczewicz 721. RX-1976 at ¶¶ 1-4, 6, 8-9, 11-15, 23-26, 34-44, 88, 116; RX-1994 at 3-4; RX-1977 at ¶¶ 32, 35, 37, 65-66, 71; RX-1032; RX-1034.

a) Motivation to Combine Rusert and Karczewicz 721

A POSITA would be motivated to combine Rusert with Karczewicz 721 because both references are similar and analogous to the ’714 Patent and the combination (1) utilizes known techniques to improve similar devices and methods in the same way; (2) combines known prior art elements according to known methods; (3) involves the simple substitution of one known element for another; (4) would not have altered the principle of operation for either Rusert or Karczewicz 721; (5) applies teachings from each reference in a conventional manner and according to their known purposes; (6) would have predictable results; (7) provides numerous advantages and was within the knowledge of a POSITA; and (8) the teachings in Karczewicz 721 would not

³ Rusert is prior art to the ’714 Patent because it was filed in the U.S. Patent Office on February 7, 2011 and published on August 11, 2011. RX-1976. Karczewicz 721 is prior art to the ’714 Patent because it was filed in the U.S. Patent Office on April 11, 2011 and published on October 13, 2011. RX-1977 (Karczewicz 721).

have discouraged a POSITA from combining them with Rusert. RX-1976 at ¶¶ 1-11, 36, 41, 43, 67, 77, 114, 116; RX-1977 at ¶¶ Abstract, 2-6, 32-38, 64-66, 73. Rusert explains its teachings not only apply to the H.264/AVC standard, but “can also be applied to an MPEG2 system, other coding standard, and indeed any coding system which uses predicted motion vectors”—including the emerging HEVC standard. RX-1976 at ¶ 116.

Nokia and Dr. Richardson argue that Rusert cannot be combined with Karczewicz 721 because PUs in H.265 can be subdivided. This argument fails for multiple reasons. RX-1976 at ¶¶ 1-10, 22, 36, 92-95, 116; RX-1944 at 88:3-89:21. *First*, none of the asserted ’714 Patent claims require PUs to be subdivided. *Second*, H.264 supported subdivision into square and non-square blocks, teaching “[p]icture partitioning into macroblocks and smaller partitions.” RX-1936 (H.264, 3/2005) at 3, 5, 25, Figs. 6-9 (allowable H.264 partitions); R-APPX at 21 (Fig. 6-9, yellow). H.264 also defined a scanning process where the decoder (and encoder) traversed any given collection of partitions in the same order. RX-1936 at §§ 6.4.2, 6.4.2.1, 6.4.2.2. H.264 further defined a process for predicting motion vectors from defined neighbors, which operated over and accounted for partitions in neighboring blocks. RX-1936 at §§ 6.4.8, 6.4.8.5, Fig. 6-14; *see also* RX-1033 at 1697-1700, Fig. 4. In fact, the emerging HEVC standard used the term “prediction unit” in the context of inter-coded frames to correspond to H.264’s partitions. RX-1032 at 64, Table 7-8. Thus, while H.264 illustrated locations using a regular grid to provide a general example of relative positions, it was not limited to square blocks given its numerous partition schemes. *See* RX-1936 at 29, Figs. 6-14, 6-9, § 6.4.8; R-APPX at 21 (Figs. 6-9, 6-14, annotated). As such, a POSITA would understand that Rusert’s applicability to H.264 applies to the motion estimation and compensation process with all of its allowable partitions. *Third*, a POSITA would understand that Rusert’s concepts of distance, ordering, and position were fully applicable to H.264, and not just

limited to using square blocks uniformly across the entire frame, particularly given its sophisticated scan patterns as illustrated in Figures 3a-3n. RX-1976 at ¶¶ 51-66, 79.⁴

b) [1pre]/[9pre]/[15pre]/[23pre] - Preambles

The preambles of claims 1 and 9 recite, “a method comprising,” while the preambles of claims 15 and 23 recite, “An apparatus comprising...cause the apparatus to.” Rusert discloses the preambles because it teaches “a method of selecting PMV candidates,” “a video encoding apparatus,” “decoding apparatus,” “computer-readable medium,” and “a processor,” that “causes said computer logic to carry out any of the methods disclosed herein.” RX-1976 at ¶¶ 1, 11, 26, 114, 116, claims 17-19. It also would have been obvious for a video encoder and decoder to include the computing architecture claimed by the ’714 Patent, at least because it has existed for decades.

c) [1a]/[9a]/[15a]/[23a] – Selecting Step

Rusert discloses these limitations under at least Nokia’s and Staff’s proposed constructions of “first spatial motion vector prediction candidate.” Rusert’s “PMV candidates” are the claimed “spatial motion vector prediction candidates” and Rusert’s “PMV_CANDS” is the claimed “motion vector prediction list.” RX-1976 at ¶¶ 3-6, 11-12, 15, 24-25, 39, 59, 79, 113, Fig. 3g, Fig. 6. Rusert teaches “an outwards going scan may be performed around the current block to obtain motion vectors” (*i.e.*, PMV candidates) for inclusion in its motion vector prediction list (*i.e.*, PMV_CANDS). As illustrated in Figures 3a-3n, motion vector candidates are selected in the sequence of search patterns taught by Rusert, beginning with the first candidate labeled “1” and traversing through the candidates in numeric and then alphabetical order. RX-1976 at ¶¶ 2-5, 30,

⁴ Contrary to Nokia’s arguments, Dr. Hemami will also explain that the ’714 Patent’s specification and claims are not limited to a “merge coding mode,” Nokia’s inventors knew how to claim a “merge list” but elected not to do so in the ’714 Patent despite earlier patents within the family reciting a “merge list,” and the disclosures of Rusert are “substantially similar” to the ’714 Patent. See RX-1976 at ¶¶ 3, 22, 36, 92-95.

34-39, 41-44, 50-67, 91-94, 100, 106, 116; Figs. 1, 3a-n (denoting the current block for prediction as “.”). Once visited along a pattern, a motion vector is selected to be included in PMV_CANDS. *Id.* The encoder/decoder in Rusert “follow the same rules for creating and modifying the set of PMV candidates.” RX-1976 at ¶ 35.

Rusert also discloses the claimed “motion vector prediction list for a prediction unit of the block of pixels.” Rusert’s PMV_CANDS satisfies this limitation and Rusert further teaches a motion vector is provided for each sub-block, of which Rusert gives an example as an “8x8 pixel block.” Dr. Hemami will further explain that the Rusert combination teaches this claimed requirement because it applies Rusert’s motion vector teachings related to “blocks” in the H.264 context to PUs (another type of block) in the emerging HEVC standard.⁵ RX-1977 at ¶¶ 33-36, 50, 64, 66.

PMV_CANDS also “comprises motion information of the spatial motion vector prediction candidates” as claimed. PMV_CANDS is a “list of PMV candidates” in which “each PMV candidate corresponds to a motion vector used for coding of a previous block.” RX-1976 at ¶¶ 11, 24-25, 37, 39, 41, 91-94, 100, 106. Dr. Hemami will also explain how it would have been obvious for a POSITA to incorporate “data defining a motion vector for the PU” as taught by Karczewicz 721 into PMV_CANDS. RX-1977 at ¶ 35.

Rusert and its PMV_CANDS are also “utilized to identify motion vector prediction candidates of which one spatial motion vector prediction candidate from the motion vector prediction list is signaled as the motion information for the prediction unit,” the final requirement

⁵ Stated differently, Rusert’s motion vector teachings are applied to blocks in the H.264 context (*see, e.g.*, RX-1976 at ¶¶ 2-5, ¶ 36, ¶ 43). Karczewicz 721, in turn, explains that in the emerging HEVC standard, a PU is a type of block and motion vectors are assigned to PUs. RX-1977 at ¶ 33-36, 64, 66.

[REDACTED]

of 15[a]/1[a]. Not only was this concept previously known, but Rusert teaches an index is used to signal a PMV candidate from PMV_CANDS as the “predicted motion vector (PMV)” for a block. RX-1976 at ¶¶ 35-37, 75, 88-102, Table 1, Figs. 2a-2b. For example, in Figures 2a and 2b, “index 250” signals “PMV_2 242” from PMV_CANDS, which includes a list of PMV candidates. *See id.*; R-APPX at 22 (Figs. 2a and 2b annotated).

d) [1b]/[9b]/[15b]/[23b] – Determining a Subset Step

Rusert discloses 1[b], 9[b], 15[b], and 23[b]. RX-1976 at ¶¶ 4-5, 11-13, 15-17, 24-25, 36-41, 43-49, 51-66, 107, 113, Figs. 2a-2b, 3a-3n, 6. *First*, Rusert “determine[s] a subset of spatial motion vector prediction candidates.” Rusert expressly teaches “selecting a set of PMV candidates as a subset of the set of previously coded motion vectors that were used for previous blocks.” RX-1976 at ¶¶ 11-12 (“selecting a subset of the motion vectors previously used for previous blocks”), ¶¶ 24-25 (similar).

Rusert’s determined subset of PMV candidates consists of the previously coded PMV candidates obtained from blocks in previous locations in a scan order. RX-1976 at ¶¶ 4-5, 11-12, 15, 24-25, 36-39, 43-44, 51-66, Figs. 3a-3n. Looking to Figure 3n as an example, when Rusert selects candidate “3” (blue), the subset of PMV candidates consists of PMV candidates obtained from blocks “1” and “2” (green).⁶ R-APPX at 22.

Second, Rusert’s subset is “based on the location of the block associated with the first spatial motion vector prediction candidate” (*i.e.*, the block of pixels corresponding to the first spatial motion vector prediction candidate). That is because Rusert’s determined subset, in most instances, can only include candidates that are at a substantially similar or smaller distance from

⁶ Rusert also teaches that its scan may be terminated under certain conditions, such as “once a certain distance has been reached.” *See* RX-1976 at ¶¶ 37-41, 44-49, 51-66, 107.



the block of pixels being encoded or decoded. RX-1976 at ¶¶ 44, 51-59, 64-66, Figs. 3a, 3b, 3d, 3e, 3f, 3g, 3n. For example, in Figure 3a, Rusert illustrates all block locations at constant distances and illustrates those same locations with an imposed order in Figure 3b. R-APPX at 22. Ordered constant distances correspond to locations and that same logic extends to the scan patterns in Figs. 3c-3n.⁷

These teachings align with Nokia's H.265 infringement read. For example, Nokia asserts that when certain candidates are selected (such as A0 and B1), the determined subset for those candidates is A1. Notably, when those candidates are allegedly selected for processing, A1 has already been moved onto the alleged motion vector prediction list such that the motion vector prediction list and determined subset consist of A1.

Nokia and Dr. Richardson argue that Rusert does not disclose these limitations because “the makeup of PMV_CANDS ... has already been determined” before Rusert selects a PMV candidate. That argument, however, completely undermines Nokia's infringement read. In fact, Dr. Moulin agreed that the alleged subsets in H.265 “ha[ve] been determined a long time ago” before any Accused Product ever selected a candidate for processing, thus refuting the temporal restriction that Nokia now seeks to impose on the claims. Further still, both of Nokia's '714 experts agreed that the claim language “based on the location” did not mean “solely” on location, and could include the consideration of other factors.

⁷ Rusert also discloses these limitations assuming “the block” refers to the previously-recited “block of pixels” being encoded or decoded. This is because Rusert's subset of PMV candidates is determined based on “an outwards going scan ... around the current block.” RX-1976 at ¶¶ 43-44. Rusert also teaches its subset of PMV candidates is determined based on an “allowed distance from the current block and an allowed position” and blocks that do not have an “allowed position” or are outside of the “allowed distance” are not scanned even if they are within the set. *See id.* at ¶¶ 11, 13, 15-17, 24-25, 43-44, 47, 51-66, 113, Figs. 3a-3n.

e) [1c]/[9c]/[15c]/[23c] – Comparing Step

Rusert “compare[s] motion information ... in the determined subset of spatial motion vector prediction candidates,” as required by 1[c]/9[c]/15[c]/23[c]. RX-1976 at ¶¶ 2-3, 11-13, 15-16, 21, 36-37, 44-48, 62, 64-65, 70-72, 75, 84-98, 107, 113, Figs. 3m-3n. Rusert discloses at least two exemplary comparisons that are performed to determine whether a selected PMV candidate is included in PMV_CANDS. *See id.* *First*, Rusert excludes the PMV candidate if it is a duplicate of candidates in the subset. RX-1976 at ¶¶ 21, 62, 71. *Second*, Rusert determines whether candidates are within a threshold distance of an existing PMV candidate in the determined subset, comparing x and y information of the candidate motion vectors.⁸ *Id.* at ¶¶ 21, 72, 87. Rusert teaches these comparisons can be performed when evaluating whether PMV_CANDS is updated with a PMV candidate.

Rusert also discloses the requirement of “without making a comparison of each possible candidate pair from the set of spatial motion vector prediction candidates.” In each of Rusert’s comparisons, a comparison is not made of each possible candidate pair from the set of PMV candidates.⁹ *See* RX-1976 at ¶¶ 11-13, 15-16, 21, 71, 113.

In arguing that this limitation is not disclosed by Rusert, Nokia and Dr. Richardson misleadingly confuse Rusert’s “subset” with “set.” The set of candidates in Rusert is either (a) all previously coded motion vectors for a particular frame or (b) all PMV candidates within a particular scan order. Under either formulation, Rusert does not make a comparison of each possible candidate pair and thus discloses limitations 1[c]/9[c]/15[c]/23[c].

⁸ A third example considers whether a PMV candidate would ever be used because at least one alternative candidate allows motion vectors to be coded using fewer bits. RX-1976 at ¶¶ 91-95.

⁹ Rusert also teaches scan patterns within an allowed distance and terminating the scan under certain conditions. RX-1976 at ¶¶ 44-48, 64-65, 107.

f) [1d]/[9d]/[15d]/[23d] – Determining to Include or Exclude Step

Rusert discloses 1[d], 9[d], 15[d], and 23[d]. RX-1976 at ¶¶ 20-22, 39, 44, 71-72, 87, 90. Rusert performs the aforementioned comparisons of a PMV candidate's motion information with information of the subset in PMV_CANDS. Rusert then determines to include or exclude the selected candidate in PMV_CANDS based on these comparisons. *See id.*

g) [1e]/[9e]/[15e]/[23e] – Transmit/Receive Step

Rusert discloses 1[e]/15[e], which recite “[cause/causing] information...to be transmitted to a decoder or to be stored.” RX-1976 at ¶¶ 34-37, 75, 88-102, Figs. 1, 2a-2b. Rusert teaches an index that is used to select a candidate from PMV_CANDS and is “sent” to and used by the decoder. RX-1976 at ¶¶ 34-37, 75, 91-92, Figs. 2a-b. This index is “information identifying the one spatial motion vector prediction candidate” as claimed. *Id.* at ¶¶ 34-37, 88-102, Fig. 1 (sending “encoded video stream,” including the index, to a transmitter that passes it to a decoder); ¶ 91 (exemplary index codes). Rusert teaches “the respective lists of PMV candidates” are “stored in the encoder and decoder.” *Id.* at ¶ 35.

Rusert also discloses 9[e]/23[e], which recite “[select/selecting] a [SMVPC]...from the motion vector prediction list constructed by the encoder.” In Rusert, a PMV candidate is selected from PMV_CANDS through an index. The decoder builds PMV_CANDS “follow[ing] the same rules” as the encoder, and uses the index “signaled from the encoder” to “select a particular PMV candidate” from PMV_CANDS to reconstruct the motion vector for the current block. RX-1976 at ¶¶ 23, 34-37, 39, 88-95, Figs. 1, 2a-b.

3. Nakamura in combination with WD4

A POSITA would have found claims 1, 9, 15, and 23 of the '714 patent to be obvious based on the teachings of JVTVC-F419 (RX-1969), JVTVC-F419_presentation (RX-1970), and

JVTVC-F419_Proposal1_WD (RX-1972) (collectively “Nakamura”) in combination with JCTVC-F803_d1 (“WD4”) (RX-1993).

a) Public Accessibility

Nakamura and WD4 were publicly accessible before the ’714 patent’s November 4, 2011 provisional filing, as confirmed by Frank Bossen’s declaration regarding Nakamura and WD4 specifically, and by inventor Jani Lainema’s testimony that proposals to the H.265 standard were publicly available during the relevant period, rendering these references prior art under at least pre-AIA § 102(a). RX-1995 (Bossen Decl.); RX-2686 (8/21/2025 J. Lainema Dep. Tr.) at 108:03-110:16.

b) Motivation to Combine

A POSITA would have been motivated to combine Nakamura with WD4 because Nakamura was expressly proposed at the JCT-VC to simplify and improve HEVC Working Draft 3 for integration into subsequent drafts, and WD4 in fact incorporated Nakamura’s spatial merge candidate unification, confirming both the technical fit and the expectation that Nakamura’s teachings would be combined with the WD4 framework. RX-1969 (Nakamura Proposal) Abstract, Introduction, § 6; RX-1993 (WD4) Abstract, 1.

c) [1pre]/[9pre]/[15pre]/[23pre] – Preambles

Complainants do not dispute that the preambles are met by Nakamura in combination with WD4. Nakamura and WD4 teach the preambles of claims 15 and 23 because both disclose software-implemented HEVC encoding and decoding techniques executed on conventional computing hardware—i.e., a processor operating on memory storing program code that, when executed, causes the apparatus to perform the claimed functions. RX-1969 (Nakamura Proposal) Abstract, § 1, § 2.1, § 2.3.1., § 3.3.3 Fig. 1, Tables 5-12; RX-1993 (WD4) Annex A, § 0.5, 3.37.

d) [1a]/[9a]/[15a]/[23a] – Selecting Step

Complainants do not dispute that the selecting step is met by Nakamura in combination with WD4. Nakamura discloses these limitations under at least Nokia’s and Staff’s proposed constructions of “first spatial motion vector prediction candidate.” Nakamura and WD4 teach this limitation by disclosing selection of a spatial motion-vector prediction candidate from a defined set of neighboring blocks for inclusion in a motion-vector prediction list associated with a prediction unit. Nakamura selects a first spatial candidates S1 from neighboring positions and places it into a merge candidate list whose entries carry motion information, with one candidate ultimately chosen for the prediction unit. WD4 provides the HEVC framework confirming that such spatial candidates are selected from a neighbor set, added to a mergeCandList comprising motion information, and used to signal the motion information for the block. RX-1969 (Nakamura Proposal) §§ 1, 2.2.1, Tables 2-4, Figs. 1; RX-1970 (Nakamura Presentation) 8, 10, 12-14; RX-1993 (WD4) §§ 6.3, 8.4.2.1.1-.2.

e) [1b]/[9b]/[15b]/[23b] – Determining a Subset Step

Nakamura and WD4 teach this limitation by determining a subset of SMVPCs based on the location of the block from which the first spatial candidate is derived. Nakamura selects an initial spatial candidate (S0) from a specific neighboring block location (A–E), after which only candidates from location-defined neighboring blocks are considered for inclusion as S1, with redundancy checks performed relative to S0. Thus, once the first spatial candidate is chosen from a particular source block, the remaining candidates evaluated—and therefore the operative subset—are determined by that candidate’s block location, satisfying the claim requirement. RX-1969 (Nakamura Proposal) Abstract, §§ 1, 2.2.1, Tables 2-4, Figs. 1; RX-1970 (Nakamura Presentation) 8, 10, 12-14; RX-1993 (WD4) §§ 6.3, 8.4.2.1.1-.2.

f) [1c]/[9c]/[15c]/[23c] – Comparing Step

Nakamura and WD4 teach this limitation by comparing the motion information of a newly selected spatial candidate only to the motion information of the spatial candidate(s) already admitted to a reduced working list, rather than comparing all possible candidate pairs from the original neighbor set. The first SMVPC (S1) is selected. The subset (S0) is determined. The first SMVPC (S1) is compared to subset (S0), implementing the claimed comparison. By restricting the merge list to a small number of spatial candidates and removing duplicates based on those limited comparisons, Nakamura and WD4 avoid the exhaustive all-pairs comparison and therefore satisfy the “without making a comparison of each possible candidate pair” requirement. RX-1969 (Nakamura Proposal) §§ 1, 2.2.1, Tables 2-4, Figs. 1; RX-1970 (Nakamura Presentation) 8, 10, 12-14; RX-1993 (WD4) §§ 6.3, 8.4.2.1.1-.2.

g) [1d]/[9d]/[15d]/[23d] – Determining to Include or Exclude Step

Nakamura and WD4 teach this limitation by determining whether to include or exclude an SMVPC based on a comparison of its motion information to that of another candidate already in the list. As both references explain, when two candidates have identical motion vectors and reference indices, the later-ordered candidate is excluded to eliminate redundancy, while the earlier-ordered candidate is retained. Conversely, when the motion information differs, the candidate is included in the motion vector prediction list as a non-redundant entry. RX-1969 (Nakamura Proposal) §§ 1, 2.2.1, Tables 2-4, Figs. 1; RX-1970 (Nakamura Presentation) 8, 10, 12-14; RX-1993 (WD4) §§ 6.3, 8.4.2.1.1-.2.

h) [1e]/[9e]/[15e]/[23e] – Transmit/Receive Step

Complainants do not dispute that the transmit/receive steps are met by Nakamura in combination with WD4. Nakamura and WD4 teach this limitation by causing information identifying the selected spatial motion vector prediction candidate to be transmitted to the decoder

[REDACTED]

or stored with the coded video, and being received by the decoder. WD4 specifies the syntax element `merge_idx`, which identifies the selected candidate in the merging candidate list and is encoded in the bitstream for each prediction unit operating in merge mode, allowing the decoder to retrieve and apply the same candidate during decoding. Nakamura confirms this conventional HEVC practice by implementing merge mode in the reference software and using the signaled candidate index in both encoding and decoding simulations. RX-1969 (Nakamura Proposal) §§ 1, 2.2.1, Tables 5-8, 11-12; RX-1970 (Nakamura Presentation) 16-18; RX-1993 (WD4) §§ 0.2, 3.11, 3.12, 3.34, 3.38, 7.3.7, 7.4.7, 8.4.2.1.1.

4. Secondary Considerations

No commercial success tied to the invention of the '714 Patent. Nokia fails to show a nexus between the asserted subset-based comparison process and product demand, and those features are not marketed as drivers of sales. The commercial success of the accused products is more plausibly attributable to unrelated factors such as brand, price, and non-video features. Inventor testimony further confirms that H.265 incorporates many pre-existing technologies and that no particular Nokia invention—including the '714 patent—was identified as a significant or essential contributor to the standard. RX-1944 (Lainema 1379/1380 Tr.) 53:11-55:7, 87:18-89:21; RX-1943 (Hallapuro 1379/1380 Tr.) 101:6-129:20, 142:1-143:16.

The invention of the '714 Patent did not address any long-felt but unmet needs. Indeed, inventor Jani Lainema acknowledged that Nakamura addressed the same problem as the '714 patent. RX-1944 (Lainema 1379/1380 Tr.) 300:10-302:10. Nokia's additional reliance on alleged skepticism, unexpected results, or failed attempts likewise fails, as Nokia identified no supporting evidence and Lainema could not articulate any differences or improvements of the '714 patent over Nakamura. RX-1944 (Lainema 1379/1380 Tr.) 305:11-14, 305:18-306:1.

No industry recognition nor praise tied to the invention of the '714 patent. Although H.264 and H.265 standards received awards, the inventors testified those awards were not attributable to the '714 patent, nor were they aware of any praise for it outside Nokia. RX-1943 (Hallapuro 1379/1380 Tr.) 81:3-82:8; RX-1944 (Lainema 1379/1380 Tr.) 57:2-10, 58:1-9, 309:3-5. Nokia's reliance on books praising HEVC is also unavailing because it does not link that praise to the '714 patent, and in any event includes chapters authored by the patent's own inventors, which does not constitute independent industry praise. RX-1944 (Lainema 1379/1380 Tr.) 147:15-149:1.

No evidence of copying of the invention of the '714 patent. The mere fact that industry participants implement H.265-compliant codecs reflects adherence to an industry standard, not copying or technical superiority of the '714 patent's specific features.

No evidence of any licenses entered into because of the '714 patent. *See* JX-0021C (Dixit) at 113:1–114:9.

5. The '714 Patent Is Invalid Under Section 101

The claims of the '714 patent are patent-ineligible because they: (1) cover the abstract idea of performing fewer than exhaustive comparisons between items in a set; and (2) lack an “inventive concept.” *Alice Corp. Pty v. CLS Bank Int'l*, 573 U.S. 208, 217-18 (2014).

Claim 15 of the '714 Patent is representative. The four asserted independent claims of the '714 patent do not “differ in any manner that is material to the patent-eligibility inquiry” and are directed to the same abstract idea. Therefore, Claim 15 of the '714 patent is representative of the claims of the '714 patent. *Mortgage Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314, 1324 n.6 (Fed. Cir. 2016).

Alice, Step One: The claims of the '714 Patent are directed to the abstract idea of performing fewer than exhaustive comparisons between items in a set. The video coding

[REDACTED]

functions recited by the '714 patent were well-known in the prior art long before the priority date of the '714 patent. It was widely known to generate sets of spatial motion vector prediction candidates, construct candidate lists, and signal a selected candidate to the decoder via an index for use in decoding the current block. RX-2686 (Lainema Tr.) 261:5-10, 262:18-263:7, 266:5-22, 272:4-17, 272:19-273:7, 275:6-14, 292:2-293:7, 296:9-12, Ex. 4. The prior art further taught it was useful and beneficial to remove duplicate candidates. *Id.* The abstract idea of comparing an option to fewer than all other options has wide applicability beyond the field of video coding. For example, a customer does not typically compare a bottle of wine to each and every other bottle of wine in the store; rather, they might compare it to a few of the nearby bottles of wine, which are likely similar in price, style, or origin. Similarly, a shopper likely doesn't compare a shoe to every other shoe for sale in a shoe store; instead they might compare it to just the nearby shoes because they are similar in price and purpose (e.g., running shoes or basketball shoes).

Nokia contends that the '714 patent represents a technological improvement in video coding, but that assertion is unsupported. The '714 patent expressly acknowledges merge mode as prior art and did not invent or alter the fundamental merge-mode and similar processes, which both before and after the '714 patent required signaling a selected merge candidate (typically by index) and rebuilding the same candidate list at the decoder. Nor does the '714 patent reduce the volume of transmitted information. To the extent the patent allegedly reduces computational effort by limiting comparisons among spatial motion vector candidates, any such reduction reflects only performing fewer comparisons than earlier HEVC proposals—not a substantive improvement to video coding or computer technology itself.

Alice, Step Two: The claims of the '714 Patent lack an inventive concept. The asserted claims of the '714 patent recite video coding functions and components that were well-known,

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routine and conventional, regardless of whether one considers the recited components individually or as an ordered combination.

The “processor,” “memory,” and “computer program code” recited in the asserted claims of the ’714 patent are generic computer components performing generic video-coding functions. The specification expressly confirms that the disclosed processors may be any suitable type, including general-purpose computers, special-purpose computers, microprocessors, DSPs, or multicore processors, and that the memory may be implemented using any conventional storage technology. JX-0004 (’714 Pat.) 24:59-64, 24:38-59. The patent further states that the claimed functionality may be implemented in software, hardware, or a combination of both, reinforcing that the computer program code is likewise generic rather than specialized. JX-0004 (’714 Pat.) 24:59-64, 24:38-59.

Accordingly, the asserted claims do not recite any unconventional or specialized computing architecture. Instead, they rely on standard processors, memory, and software arrangements that were widely known and routinely used in the art at the time.

VII. U.S. PATENT NO. 11,805,267

A. Claim Construction

The parties’ proposed constructions for “precision” are set forth in the Joint Post-Markman Hearing Claim Construction Chart. Respondents’ proposed construction for “precision” (*i.e.*, “number of bits needed to represent possible values”) should be adopted for numerous reasons. *First*, Respondents’ construction is strongly supported by the intrinsic record, including the language of the dependent claims, specification, file history, and Nokia’s prior IPR admissions. *Second*, Nokia and Staff have no intrinsic support for their new requirements (*i.e.*, “number of distinct alternatives from which a value can be determined” and “each possible distinct alternative”), which if adopted, would violate claim differentiation principles by causing

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“precision” in the independent claims to have a narrower scope than its meaning in dependent claims. JX-0007 (’267 Patent) at claims 6, 12, 18, 24, 30, 36. *Third*, Nokia’s proposed construction (and related arguments) would exclude the ’267 Patent’s left-shifting embodiment, despite the claims and specification teaching that predictions can be obtained at a higher precision through left-shifting. JX-0007 (’267 Patent) at claims 4, 10, 16, 22, 28, 34, 14:4-10.

B. Infringement

1. Non-Infringement of Asserted Decoding Claims 20 and 26

The Accused Products do not infringe the asserted decoding claims (or encoding claims) because they do not “[1] decrease a precision of said combined prediction [2] by shifting bits of the combined prediction to the right,” as required by the claims.

There are generally two approaches to binary number representation: unsigned representation (representing only positive integers) and signed representation (representing positive and negative integers). *Id.* at ¶¶ 32-48. The H.265 Standard and AV1 Specification use signed integer representation. *See* RX-2078 (H.265 04/2013) at 14; RX-2226 (AV1) at 18. Dr. Moulin opines that the “precision” of a signed representation in H.265 and AV1 decreases after performing an arithmetic right shift. This is incorrect: instead, the length of a signed representation remains the same before and after an arithmetic right shift operation. In signed representations, the computer system looks to the most significant bit (“MSB” or “sign bit”) to determine whether the number represented by the binary string is positive or negative to calculate its overall value.

Nokia’s and Dr. Moulin’s own examples show why “precision” does not decrease under Complainants’ and Staff’s proposed constructions, which requires demonstrating the number of bits “required to represent each possible distinct alternative.” As illustrated in the Appendix (*see* R-APPX at 23, “Register Size Maintained After Shift”), Dr. Moulin illustrates a binary string 11101010 (yellow) after it has been arithmetically shifted to the right by one bit (11110101



(orange)) and shifted to the right by yet another bit (11010101 (gray)). Contrary to his assertions, the precision of each binary string has not changed because each is a (1) possible distinct alternative for a pixel or prediction value in an H.265 or AV1 implementation and (2) eight bits are required to represent each distinct alternative. A computer receiving any of these values requires all eight bits of information in each string to identify the MSB (here, “1”) and determine signage of the number being represented (here, “negative”). Applying Respondents’ proposed construction of “precision” leads to the same conclusion.

Dr. Moulin speculates that a programmer or computer designer may be able to use fewer bits to represent a binary string after an arithmetic shift. But computers do not work like this. Instead, as Dr. Schoenfeld will explain, a computer system does not ignore the MSB that results from an arithmetic shift. In signed representations, the computer system still requires the predefined MSB in the register to determine the sign bit and the overall decimal value being represented.

As further examples of its obfuscations, Nokia and Dr. Moulin assert there is no difference between storing the number 25 as the unsigned representation 11001 or 11001000. That is wrong: Dr. Schonfeld will explain that a computer understands the unsigned representation 11001 to be the decimal number 25 and 11001000 to be the decimal number 200 (*i.e.*, the former string left-shifted by three bits (25 multiplied by 2^3)). Dr. Schonfeld will also explain why Nokia’s “ruler” analogies are inapt because when using signed representation, precision remains unchanged because it is equivalent to using a ruler with a fixed number of notches.¹⁰

¹⁰ There are additional deficiencies in Nokia’s standards-based infringement arguments, including its failure to map multiple claim elements to the H.265 standard and AV1 specification (such as the “first precision” for the “current block,” “first reference block,” and “second reference block,”

2. No Infringement Under Doctrine of Equivalents

Dr. Moulin speculates that truncation operations are the “same concept” as right shifting operations and infringe under the doctrine of equivalents. These assertions are insufficient as a matter of law because Dr. Moulin has failed to provide any particularized testimony or linking argument to show equivalence. *See, e.g., NexStep, Inc. v. Comcast Cable Commc’ns, LLC*, 119 F.4th 1355, 1374 (Fed. Cir. 2024) (“An expert’s ‘offhand and conclusory statements’ that the purported equivalent ‘functions like’ the claim limitation is insufficient.”); *VLSI Tech. LLC v. Intel Corp.*, 87 F.4th 1332, 1344-45 (Fed. Cir. 2023) (similar).

Dr. Schonfeld will testify that truncation and other similar operations are not equivalent and are significantly different from an arithmetic right shift because the latter must maintain the MSB to preserve the sign of a signed integer representation and an arithmetic right shift could produce a string of bits substantially different from a string of bits that has been truncated. There are also substantial differences in the way truncation and arithmetic right shift operations are performed, especially depending on whether the operations are implemented on a general-purpose computer or dedicated hardware.

3. Non-Infringement of Asserted Encoding Claims 2 and 8

Dr. Moulin relies on improper evidence (primarily VQ Analyzer screenshots) to assert that the Accused Products infringe the encoding claims of the ’267 Patent. But VQ Analyzer screenshots provide no insight into whether the *encoders* of the Accused Products perform the recited operations in claims 2 and 8, including the “first precision,” “second precision,” “first

as well as the “first prediction” and “second prediction”). And Dr. Schonfeld will further explain that to comply with H.265 and AV1, a device need only produce decoded pictures identical to those created by the procedures outlined in H.265 and AV1, not adhere the exact instructions of those documents by chapter and verse. *See* JX-0137 (H.265) at 11, 117; JX-0138 (AV1) at 195.

[REDACTED]

prediction,” “second prediction,” decrease of precision through right shifting, and other requirements built upon these elements.¹¹

Nokia cannot show infringement of the encoding and decoding apparatus claims for an additional reason: these claims require a software implementation (*i.e.*, “computer program code configure to” cause the apparatus to perform the recited operations) but Nokia relies on only hardware consisting of vendor chipsets—not software—to perform the recited operations.

Dr. Schonfeld also disputes Nokia’s allegations of standard essentiality for the ’267 patent and will explain that the ’267 patent provides minimal value to H.265 or AV1 because it is a minor change to bi-directional prediction. Dr. Schonfeld will also explain that if the ALJ were to determine that any of Nokia’s asserted decoding claims of the ’267 patent were essential to H.265 (or infringed by AV1), then a similar determination should also apply to the asserted encoding claims of the ’267 patent (including encoders that use and implement bi-directional prediction processes), given that Nokia declared the ’267 patent family to be essential (RX-2298) and the similarity between its encoding and decoding disclosures. JX-0007 (’267 patent) at 7:22-24, Fig. 5 and related disclosures, Fig. 11, 12:41-15:10, 15:14-15, 2:1-8; *compare id.* at claims 1-18 *with id.* at claims 19-36.

4. No Infringement Under Nokia’s Vendor Source Code Analysis

Nokia’s reliance on Verilog code fails for all the reasons discussed previously with the ’714 Patent and is otherwise generally deficient.¹² Dr. Schonfeld will explain how Dr. Moulin’s

¹¹ Dr. Moulin has also failed to show his cited testing is representative. *See Certain LED Lighting Devices, LED Power Supplies, & Components Thereof*, Inv. No. 337-TA-1081, Comm’n Op. at 9-16 (July 23, 2019) (finding complainants failed to show any product was representative of any other product where complainants relied upon conclusory expert testimony).

¹² Global deficiencies in that regard include (1) not mapping the cited source code to the claim limitations; (2) not showing the cited code is present in any Accused Products or was used to



C. Technical Domestic Industry

Nokia's allegations and evidence regarding why the technical prong of the domestic industry requirement are practiced by the DI products are identical to its infringement allegations. Indeed, Nokia relies on the same parts of the H.265 standard and AV1 specification, and analyzes the same source code from some of the same chipmakers. Thus, Nokia has failed to meet the technical domestic industry requirement for the same reasons as set forth above with respect to infringement.

D. Invalidity

1. Walker + Srinivasan

“Walker” (RX-2018, U.S. Patent Application Publication No. 2005/0281334),¹³ alone or in combination with “Srinivasan” (RX-2024, U.S. Patent No. 7,620,109)¹⁴ renders obvious the asserted claims of the '267 patent. Walker teaches “multiple weighted bi-directional encoding schemes” for encoders and decoders. RX-2018 at ¶ 8. Srinivasan teaches sub-pixel interpolation techniques applicable to bi-prediction. RX-2024 at Figs. 9-11, 18:8-20:38, Fig. 14, 21:22-52.

In the 1380 Investigation, ALJ Elliot found that Walker rendered obvious claims 7, 25, and 26 of the '267 patent, but found insufficient evidence regarding the level of ordinary skill in the art to render obvious claims 8, 9, and 27. RX-1945 (1380 ID) at 139-40. In this Investigation, Respondents have bolstered the analysis of Walker and combined its disclosures with those of Srinivasan as a further avenue to invalidate the asserted claims of the '267 patent.

a) Motivation to Combine Walker and Srinivasan

¹³ Walker is prior art to the '267 Patent because it was published on December 22, 2005, and was filed as application 11/120,513 on May 2, 2005. RX-2018 (Walker).

¹⁴ Srinivasan is prior art to the '267 Patent because it was filed on April 10, 2002, published on October 30, 2003. RX-2024 (Srinivasan).

[REDACTED]

Dr. Schonfeld will testify that a POSITA would have been motivated to combine Walker's encoding and decoding teachings because those processes are complimentary of and used in conjunction with each other. RX-2018 at ¶¶ 1, 3, 8, 25-26, 29, 34-35, 45-72, 92, 101, 104, 110-112, 114, Figs. 1, 5 and 8-9. It also would have been obvious for a POSITA to combine Walker with Srinivasan to improve bi-directional efficiency and reduce prediction error; and also because both are analogous references in the same field and are directed to video coding techniques disclosed in and applicable to analogous video coding standards. *Compare* RX-2018 at ¶¶ 3, 30-35, 47-94, 111, 114, Figs. 8-9 *with* RX-2024 at Abstract, 1:27-5:12, 12:6-59, Figs. 9-11, 18:8-20:38, Fig. 14, 21:22-52, 6:46-51, 5:47-50, 16:65-17:16, 9:26-49.

A POSITA would have been knowledgeable about sub-pixel interpolation (as evidenced by the '267 patent, Nokia's inventors, Walker, and Srinivasan).¹⁵ A POSITA also would have had a reasonable expectation of success with combining Srinivasan's interpolation methods with Walker because it was well-known for encoders and decoders to create a prediction having a higher bit-depth to increase accuracy and reduce rounding errors, and also because Srinivasan's interpolation teachings are similar to and compatible with those of Walker and the '267 patent. RX-2024 at 1:52-58, 9:4-10, 9:26-32, 20:33-38, 22:60-23:7.

b) Encoding Claim Elements 7[pre] and 1[pre]

It is undisputed that Walker teaches an apparatus and method for encoding a block of pixels. *See, e.g.*, RX-2018 at ¶¶ 3, 25, 30, 34, 60, 111, Fig. 1; RX-1945 (1380 ID) at 139-40; RX-1071 at 11-21; RX-1074 at 11-21.

¹⁵ JX-0007 ('267 patent) at 2:60-3:11; RX-1944 (Lainema 1380 Depo. Tr.) at 69:11-70:3, 73:4-6, 78:10-13, 180:2-182:5, 182:12-184:1; RX-1943 (Hallapuro 1380 Depo. Tr.) at 105:2-106:10, 129:6-20, 245:12-246:13, 215:10-216:1; RX-2018 at ¶¶ 005, 101, 104, 114; RX-2024 at 1:52-58, 9:4-10, 9:26-32, 20:33-38, 22:60-23:7, Figs. 4 and 5.

c) Encoding Claim Element 7[a]

It is also undisputed that Walker discloses implementing its encoding and decoding methods using a processor and memory that includes computer program code (*e.g.*, a software module).¹⁶ RX-2018 at ¶¶ 122-123.

d) Encoding Claim Elements 7[b] and 1[a]

Walker determines, for a current block (*e.g.*, Walker’s “current macroblock” 515), a first reference block (*e.g.*, “best matching macroblock” 520 in previous reference picture 510) based on a first motion vector (*e.g.*, motion vector 525) and a second reference block (*e.g.*, “best matching macroblock” 580 in subsequent reference picture 575) based on a second motion vector (*e.g.*, motion vector 585). RX-2018 at ¶¶ 28-29, 32, 34, Fig. 5; R-APPX at 26. Walker determines both reference blocks for the current macroblock based on their corresponding motion vectors. JX-0007 (’267 patent) at 2:20-34, 3:12-18; RX-2018 at ¶¶ 32, 34, Fig. 5.

Walker’s first precision is 8 bits. RX-2018 (Walker) ¶ 30 (“Pixels can be defined by an 8-bit luminance value (Y) and two 8-bit chrominance values (Cr and Cb).”), ¶ 60 (“pred0 and pred1[] are 8-bit luminance and chrominance...samples”); RX-1945 at 134. These disclosures satisfy each proposed construction of “precision,” because Walker discloses that 8 bits (*i.e.*, 256 distinct alternatives) are needed to represent the possible pixel values in the reference blocks.

Nokia and Dr. Richardson argue that when Walker’s motion vectors point to a sub-pixel, Walker’s best matching macroblocks 520 and 580 are not pixels and instead are the result of interpolation. That is incorrect. As Dr. Schonfeld explained, when Walker’s motion vectors point to a sub-pixel, there would still be first and second reference blocks consisting of immediately

¹⁶ It also would have been obvious for a POSITA to implement Walker’s teachings in the claimed computer architecture because that architecture has been conventional for decades. RX-1944 at 91:2-12, 213:8-214:14.

neighboring pixels that are interpolated to arrive at the sub-pixel value (see, for example, the round pixels in Figure 9 of Walker, which are interpolated to arrive at the square sub-pixel positions).¹⁷

RX-2018 at Fig. 5, 9, ¶¶ 30, 34-35, 60, 114.

e) Encoding Claim Elements 7[c] and 1[b]

Walker’s encoder uses the first reference block (*e.g.*, a “prediction block” from a past frame) to obtain a first prediction (*e.g.*, “(pred0)w0” or “pred0” when interpolated). RX-2018 at ¶¶ 59, 66-68; R-APPX at 26-27 (green elements in Equation 13 and Table 2). Walker’s “(pred0)w0” is a first prediction because it is the product of a pixel value (*e.g.*, pred0) from a reference block multiplied with a scaling factor (*e.g.*, weight w0), which is used for motion prediction. RX-2018 at ¶¶ 34, 60, 68-69, Table 1. Walker also teaches that 16 bits are needed to represent the first prediction (*e.g.*, “(pred0)w0”), which is a higher number of bits than the first precision (*e.g.*, 8 bits), exactly as Judge Elliot found in the 1380 ID. RX-2018 at ¶ 34, 84, Equation 13, Table 2; R-APPX at 26-27 (Table 2 – 16 bits for Op. 1); RX-1945 at 135-36.

Nokia and Dr. Richardson argue that “pred0(w0)” and “pred1(w1)” are not predictions. They are wrong for several reasons: (1) ALJ Elliot and the PTAB already rejected this argument (RX-1945 at 136; RX-1071 at 13-17; RX-1074 at 13-17); (2) the ’267 claims only require “using” reference blocks to obtain predictions and do not preclude weighted prediction; (3) Nokia increasingly broadened the manner by which predictions are obtained in the ’267 patent family (RX-2462; RX-2464; RX-2466; RX-2468; RX-2470); (4) the ’267 patent includes embodiments where predictions are calculated by performing mathematical operations on pixel values in reference blocks (including weights) (JX-0007 (’267 patent) at 12:41-13:18, 13:19-42, 14:11-22);

¹⁷ Notably, when Walker’s motion vectors point to integer pixels, Walker’s best matching macroblocks 520 and 580 do in fact consist of pixels.

[REDACTED]

(5) the '267 patent teaches that predictions can be obtained through left-shifting, which is equivalent to multiplying by powers of 2 (*i.e.*, weights) (RX-2019 (Srinivasan-935), ¶¶ 91, 116, 124, 129, 131; RX-2022 (Kirchhoffer-158) at ¶¶ 67, 84-85, 103; JX-0007 ('267 patent) at 14:5-10, claims 4, 10, 16, 22, 28, and 34; and (6) during prosecution, Nokia did not dispute that weighted predictions are first and second predictions.

Walker teaches the “second precision” under each proposed construction because it expressly discloses that 16 bits are needed to represent the possible values of its predictions (*e.g.*, “(pred0)w0” and “(pred1)w1”), consistent with Judge Elliot’s 1380 ID. RX-1945 at 135-36. Dr. Schonfeld will also explain that Walker multiplies 8-bit pixels with variable 8-bit weights, thus resulting in more alternatives.¹⁸ Dr. Schonfeld will also explain that obtaining Walker’s pred0 and/or pred1 samples using Srinivasan’s high precision interpolation teachings (*i.e.*, obtaining predictions at a bit-depth of $x+1$ or higher, discussed *infra*) would satisfy each proposed construction of “precision” because the “number of distinct alternatives” for prediction values would further expand.

Nokia and Dr. Richardson also ignore the alternate invalidity theory explained by Dr. Schonfeld in his reports and deposition. In particular, when Walker’s motion vectors point to sub-pixel positions, Dr. Schonfeld explains that the pred0 and pred1 samples are obtained by interpolating values of their respective reference blocks. RX-2018 at ¶¶ 30, 34-35, 60, 114, Fig. 5. As such, Walker’s pred0 and pred1 samples would be at a higher precision than 8 bits because they would have been obtained using an interpolation filter (*e.g.*, 2-tap filter) that increases precision for subpixel resolution, and satisfies the “second precision” under each proposed

¹⁸ RX-2018 at Abstract, ¶¶ 6-8, ¶¶ 25-26, ¶¶ 34-49, ¶ 44, ¶ 52, ¶¶ 66-70, Table 1, ¶¶ 72-73, ¶¶ 84-89 & Tables 2 and 3, ¶¶ 92-94 & Table 4, ¶¶ 95-109, Figure 8 and ¶¶ 110-13, ¶¶ 115-19.

construction. RX-2018 at Fig. 9. Multiplying pred0 and pred1 by variable weights w0 and w1 would lead to higher precision. *Id.*

f) Encoding Claim Elements 7[d] and 1[c]

Walker uses the second reference block (*e.g.*, a “prediction block” from a future frame) to obtain a second prediction (*e.g.*, “(pred1)w1” or “pred1” when interpolated), which has a second precision of at least 16 bits for all the reasons previously explained in 7[c] and 1[b]. R-APPX at 26-27 (blue elements in Equation 13 and Table 2); RX-2018 at ¶¶ 34, 60, 67-69, 84, Equation 13, Table 2, Fig. 9.

g) Encoding Claim Elements 7[e] and 1[d]

Walker teaches limitation 7[e] and 1[d]. RX-2018 at ¶¶ 67-68, 84 Table 2; R-APPX at 27 (purple element in Table 2). Walker’s combined prediction is “(pred0)w0+(pred1)w1+2^{logWD}” (as seen in Equation 13 of Walker, or Operations 3 and 4 in Table 2) and is based on the first prediction (*e.g.*, “(pred0)w0”), second prediction (*e.g.*, “(pred1)w1”), and a rounding offset (*e.g.*, 2^{LWD-1} or 2^{logWD}, which are equivalents). *See id.*

h) Encoding Claim Elements 7[f] and 1[e]

Walker teaches limitation 7[f] and 1[e] under each proposed construction. RX-2018 at ¶ 34, 67-68, 84; R-APPX at 26-27, Equation 13, Table 2. Walker explains that “>>” is a logical right bit-shift. RX-2018 at ¶¶ 46, 68. As illustrated in Operation 4 of Table 2 (*e.g.*, “>>(logWD+1)”), Walker applies a logical right shift to the combined prediction, specifically teaching that the number of bits needed to represent the combined prediction decreases from 16 to 10. RX-2018 at ¶¶ 46, 68, 84, Equation 13, Table 2.

i) Encoding Claim Elements 7[g] and 1[f]

Walker teaches 7[g] and 1[f] at least based on Nokia’s reading of the claims onto H.265’s “8.5.3.3.4.2 Default weighted sample prediction process,” which contains a clipping operation,

[REDACTED]

much like Walker's Operation No. 6 in Equation 13. RX-2018 at ¶¶ 30, 32, 34, 60, 69, 84; R-APPX at 26-27. Walker further teaches encoding the residual data in a bitstream. RX-2018 at ¶¶ 28, 34, Fig. 2B; R-APPX at 26-27.

j) Dependent Encoding Claims 8 and 2

Walker's encoder uses motion vectors to point to a subpixel (*e.g.*, an "interpolated pixel") and further teaches pixel interpolation (*e.g.*, half pixel, quarter pixel, eighth pixel) to obtain predictions. RX-2018 at ¶¶ 111, 114, Figs. 8-9, ¶ 18. This mirrors the '267 patent's subpixel teachings. JX-0007 ('267 patent) at Fig. 12, 12:56-63; R-APPX at 27. Walker uses a 2-tap filter for interpolation, teaching that other methods could also be used, as interpolation had generally been known since the 1990s. RX-1945 at 138.

To the extent not expressly disclosed, it would have been obvious to combine Walker's encoder with its interpolation teachings or alternatively with Srinivasan's multi-stage interpolation processes which are significantly similar to the '267 patent. RX-2024 at Abstract, 12:6-28, 12:46-52, 18:8-20:5, Figs. 9-11; JX-0007 ('267 patent) at 7:25-26, 12:33-50, Fig. 12. Srinivasan uses "the highest possible accuracy at every stage" of interpolation and discloses multi-stage interpolation processes, including Figure 14, in which the bit-depth of input, intermediate, and output interpolation values "can be extended arbitrarily" or otherwise "have dynamic ranges of bit depth." RX-2024 at 19:13-20:5 and 20:6-38. In Figure 14, Srinivasan teaches keeping the number of bits greater than the input bit depth throughout interpolation and right shifting to result in an output value at a higher bit depth (*i.e.*, "x+1") than the input bit depth (*i.e.*, "x"). RX-2024 at 19:55-57, 20:6-38, 21:22-52, Fig. 14; R-APPX at 28. But as Dr. Schonfeld makes clear, and Nokia's expert does not dispute, this is only an "example," and Srinivasan's interpolation outputs can take on even higher bit-depths. RX-2024 at 20:6-38.

[REDACTED]

It would have been obvious to a POSITA to apply Srinivasan's interpolation teachings so that Walker's "pred0" and "pred1" samples are obtained by Srinivasan's high-precision interpolation at 9 bits or higher bit depths. Any such implementation would satisfy the parties' proposed constructions of "precision," because Walker requires 16 bits to represent its weighted predictions, and increasing the bit depth of pred0 and pred1 would correspondingly increase the number of distinct alternatives.

k) Decoding Claim Elements 25[pre] and 19[pre]

It is undisputed that Walker teaches an apparatus and method for decoding a block of pixels. RX-2018 at ¶¶ 3, 8, 17, 21, 25-26, 30, 34-35, 60, 110-111, Figs. 1, 8.

l) Decoding Claim Element 25[a]

It is also undisputed that Walker discloses implementing its encoding and decoding methods using a processor and memory that includes computer program code (*e.g.*, a software module). RX-2018 at ¶¶ 72, 94, 122-123; RX-1944: 91:2-12, 213:8-214:14.

m) Decoding Claim Elements 25[b] and 19[a]

Walker's decoder determines, for a current block (*e.g.*, Walker's "current macroblock"), a first reference block (*e.g.*, "the already reconstructed best matching macroblock 565 in previous reference picture 510") based on a first motion vector (*e.g.*, motion vector 525) and a second reference block (*e.g.*, "the already reconstructed best matching macroblock 590 in subsequent reference picture 575") based on a second motion vector (*e.g.*, motion vector 585). RX-2018 at ¶¶ 17, 28, 35, 110-111, Fig. 1. As explained above for 7[b] and 1[a], the pixels of the current block, first reference block, and second reference block have values with a first precision of 8 bits. Walker Analysis of 7[b] and 1[a], *supra*; RX-2018 at ¶¶ 30, 52, 57, 60, 93, Table 4.

n) Decoding Claim Elements 25[c] and 19[b]

Walker's decoder uses the first reference block (*e.g.*, reconstructed best matching macroblock in previous reference picture) to obtain a first prediction (*e.g.*, “((pred0)wA)>>6” or “pred0” when interpolated). RX-2018 at ¶¶ 8, 35, 47-49, 50-55, 56-57, 58-70, 72, 74, 85-86, 90-93, 111, 116, Equation 18, Table 4, Fig. 8, Fig. 10; R-APPX at 28 (blue elements in Equation 18 and Table 4). Dr. Schonfeld will explain that Walker's “((pred0)wA)>>6” is a first prediction because it is the product of a pixel value (*e.g.*, pred0) from a first reference block multiplied with a scaling factor (*e.g.*, weight wA) and shifted to the right by 6 bits, which is used for motion prediction. RX-2018 at ¶¶ 35, 60, 93, 111, 116, Fig. 8, Fig. 10. Walker teaches that 17 bits are needed to represent the first prediction (*e.g.*, “((pred0)wA)>>6”) which is a higher number of bits than the first precision (*e.g.*, 8 bits), as Judge Elliot found in the 1380 ID. RX-2018 at ¶¶ 35, 93, 111, Table 4; RX-1945 at 135-36. As explained above with respect to encoding claim elements 7[c] and 1[b], these disclosures satisfy each proposed construction of “precision,” Nokia's contrary arguments fail, and “pred0” and “pred1,” when interpolated, can also serve as the first and second predictions at a higher precision.¹⁹ Walker Analysis of encoding claim elements 7[c] and 1[b], *supra*; RX-2018 at ¶¶ 6-8, 25-26, 34-39, 44, 52, 66-70 & Table 1, 72-73, 84-89 & Tables 2 and 3, 92-94, Equation 18, Table 4, 95-109, Fig. 8 and 110-13, 115-19; R-APPX at 26-27.

o) Decoding Claim Elements 25[d] and 19[c]

Walker uses the second reference block (*e.g.*, the reconstructed best matching macroblock in the subsequent reference picture) to obtain a second precision (*e.g.*, “((pred1)wB)>>6”), which has a second prediction of at least 17 bits for all the reasons previously explained in 25[c] and

¹⁹ In Figure 8, Walker specifically teaches that the weight parameters are received by the decoder and then are subsequently modified depending upon the implementation. RX-2018 at Fig. 8; ¶ 112. The variable nature of these weights is also amplified by the fact that Walker's encoder also uses 8-bit variable weights. RX-2018 at Abstract, ¶¶ 6-8, 25-26, 34-39, 44, 52, 66-70 & Table 1, 72-73, 84-89 & Tables 2 and 3, 92-94 & Table 4, 95-109, Figure 8 and 109-13, 115-19.

[REDACTED]

19[b]. Walker Analysis of encoding claim elements 7[d] and 1[c], *supra*; RX-2018 at ¶¶ 35, 60, 92-93, 111, 116, Equation 18, Table 4, Figs. 8-10; R-APPX at 28 (orange elements in Equation 18 and Table 4).

p) Decoding Claim Elements 25[e] and 19[d]

Walker teaches limitation 25[e] and 19[d]. RX-2018 at ¶¶ 35, 92-93, 111, Table 4; R-APPX at 28. Walker's combined prediction is $((\text{pred0})wA) \gg 6 + ((\text{pred1})wB) \gg 6 + 2^7$) (as seen in Equation 18 of Walker, or Operation 2 in Table 4) and is based on the first prediction (*e.g.*, “ $((\text{pred0})wA) \gg 6$ ”), second prediction (*e.g.*, “ $((\text{pred1})wB) \gg 6$ ”), as well as the rounding offset (*e.g.*, 2^7). *See id.*

q) Decoding Claim Elements 25[f] and 19[e]

Walker teaches limitation 25[f] and 19[e] under each proposed construction. RX-2018 at ¶¶ 35, 46, 66, 92-93, 111, Equation 18, Table 4; R-APPX at 28. Walker explains that the symbol “ $\gg$ ” is a logical right bit-shift. RX-2018 at ¶¶ 46, 66, 92-93, 111, Table 4. As illustrated in Operation 3 of Table 4 (*e.g.*, “ $\gg 8$ ”), Walker applies a logical right shift to the combined prediction, specifically teaching that the number of bits needed to represent the combined prediction decreases from 19 to 11. RX-2018 at ¶¶ 66, 92-93, 111, Equation 18, Table 4.

r) Decoding Claim Elements 25[g] and 19[f]

Walker teaches reconstructing the block of pixels (*e.g.*, reconstructed macroblock) based on the combined prediction (*e.g.*, “combined weighted prediction”) for each pixel of the current block using a weighted bi-directional prediction method and reference block pixel values, and it was well known that determining such per-pixel combined predictions collectively forms a combined weighted prediction macroblock. RX-2018 at ¶¶ 30, 35, 60, 111, Equation 18, Table 4. As explained above, Walker discloses forming a combined weighted prediction macroblock, which is added to the decoded residual error to reconstruct the macroblock or output picture. *See id.*

s) Dependent Decoding Claims 26 and 20

As already explained, Walker's motion vectors point to subpixels and Walker's decoder specifically performs interpolation using pixel values of the reference block. RX-2018 at ¶¶ 18, 111, 114, Fig. 9, Fig. 8 (item 835: "Pixel Interpolation"); RX-1945 at 138. Alternatively, as explained for claims 2 and 8, it would have been obvious to combine Walker with Srinivasan's multi-stage interpolation teachings to obtain pred0 and pred 1 at a precision of 9 bits or higher, satisfying each proposed construction. *See* Walker Analysis of dependent encoding claims 8 and 2, *supra*; RX-2024 at Abstract, 12:6-20, 12:21-28, 12:46-52; 18:8-20:38, 21:22-52, Figs. 9-11, 14.

2. Karcewicz + Karcewicz

The combination of "Karcewicz '799" (RX-2021, U.S. Patent App. Pub. No. 2011/0007799) and "Karcewicz '499" (RX-2029, U.S. Patent App. Pub. No. 2009/0257499) invalidates the asserted '267 Patent claims.²⁰ Karcewicz '799 teaches calculating bi-directional predictions for H.264 by averaging predictions based on two reference blocks, which may be calculated using sub-pixel interpolation. RX-2021 at ¶¶ 7-8, 35-37, 41, 44-46, 55-60, 62, 64. Karcewicz '499 teaches improvements to interpolation by delaying rounding and keeping precision high. RX-2029 at ¶¶ 2, 10, 39, 46-47, 53, 59, 82, 88, 93-103, 108, Tables 1-6.

Karcewicz '799 teaches the following equation for bi-directional prediction: $\text{pred}(i,j) = (\text{pred0}(i,j) + \text{pred1}(i,j) + 1) \gg 1$, in which $\text{pred0}(i,j)$ and $\text{pred1}(i,j)$ are predictions obtained from two reference blocks. RX-2021 at ¶¶ 55, 60. Karcewicz '499 teaches obtaining predictions by interpolation according to a two-step process (which can be further modified for other sub-pixel

²⁰ Karcewicz '799 is prior art to the '267 Patent because it was filed in the U.S. Patent Office on July 9, 2009 and published on January 13, 2011. RX-2021. Karcewicz '499 is prior art to the '267 Patent because it was filed in the U.S. Patent Office on April 8, 2009 and published on October 15, 2009. RX-2029.

positions): (1) calculating a non-rounded sub-pixel prediction (*e.g.*, non-rounded “b1” or “h1”) based on neighboring pixel values and (2) right-shifting the non-rounded prediction to produce a rounded result (*e.g.*, rounded “b” and “h”). RX-2029 at ¶¶ 70, 74, 93-97, Figs. 4A-4C; R-APPX at 24-25. Karczewicz ’499 improves these processes by “keep[ing] the highest possible precision through the intermediate steps” and avoiding “any shifting, rounding and clipping operations[] until the very last step of the interpolation process.” RX-2029 at ¶ 10, 39, 53, 59, 96-97, 99, 102. Combining both references yields the following bi-directional improvements (which apply when both motion vectors point to half pixel positions):

$$\text{pred}(i,j)=(\text{non-rounded}(\text{pred0}(i,j))+\text{non-rounded}(\text{pred1}(i,j))+32)>>6$$

This Karczewicz combination teaches the limitations of the asserted claims of the ’267 patent.²¹ RX-2021 at ¶¶ 41, 55-60; RX-2029 at ¶¶ 10, 39, 53, 56-59, 70, 74, 93-103, Figs. 4A, 4B (annotated), 4C, 4D, Tables 2, 4, 6.

a) Motivation to Combine Karczewicz ’799 and Karczewicz ’499

A POSITA would have been motivated to combine the two Karczewicz references for numerous reasons: (1) both are Qualcomm patent applications that involve the same inventors and common video coding architectures; (2) both are in the same field of endeavor as the ’267 Patent and provide complementary teachings that solve similar problems related to bi-directional prediction; (3) both combine prior art elements according to known methods; (4) the combination would not have changed the principle of operation of either reference; and (5) a POSITA would have had a reasonable expectation of success because the combination involve mathematical computations with known outputs. RX-2021 at ¶¶ 2, 16, 29-76, 89, Figs. 1-2, 4; RX-2029 at ¶¶ 2,

²¹ It was also well-known to use higher bit depth intermediate values for video-coding computations. Sch.Karcz.App’x at ¶ 21; RX-2422 at Abstract; RX-2026 at 7:4-19, 16:22-17:36; RX-2016 at 5; RX-2017 at ¶¶ 61-62.

8, 10, 17, 20-24, 31, 35-37, 39-63, 93-108, 163-66, Figs. 1-3, 4D. VCEG-AI33 (co-authored by Marta Karczewicz and incorporated by reference into Karczewicz '799) likewise teaches maintaining interpolated predictions at a high precision and deferring shifting and rounding until the last step. RX-2021 at ¶ 37 (incorporating VCEG-AI33); RX-2029 at ¶¶ 99-102.

Nokia and Dr. Richardson do not dispute that the Karczewicz combination teaches all elements of the asserted claims. They instead argue the '267 patent is nonobvious because Marta Karczewicz is a person of extraordinary skill who did not articulate the asserted combination in a single publication. But no evidence supports Nokia's assertion, and it is irrelevant to the obviousness determination, which is judged from the perspective of a hypothetical POSITA. *See Ebay Inc. v. Kelora Sys., LLC*, 2012 WL 1835722, at *10 (N.D. Cal. May 21, 2012). Here, a POSITA could have easily arrived at the Karczewicz combination given the teachings of Karczewicz '799 and '499, VCEG-AI33, and its own indisputable knowledge regarding interpolation.

Nokia and Dr. Richardson also mischaracterize the Karczewicz combination as being based upon "motion vectors that point to centre-pixel positions." That is not true. The Karczewicz combination is based on motion vectors pointing to *half-pixel positions*. Nokia and Dr. Richardson also contend that the Karczewicz combination does not account for all sub-pixel positions. That too is irrelevant because "[i]t is enough that the combination would sometimes perform all the [claimed] steps." *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1002 (Fed. Cir. 2016); *Hewlett-Packard Co. v. Mustek Sys., Inc.*, 340 F.3d 1315, 1326 (Fed. Cir. 2003).

b) Encoding Claim Elements 7[pre], 1[pre] and 7[a]

It is undisputed that Karczewicz '799 and '499 disclose encoders and encoding processes using the computer architecture that is claimed (processor, memory (*e.g.*, computer readable medium), computer code (*e.g.*, software)). RX-2021 at ¶¶ 2, 8-9, 22, 29-30, 32, 39-40, 51-76, 99-

100, Fig. 2; RX-2029 at ¶¶ Abstract, 2, 4, 12, 14, 25, 27, 35, 38, 40-41, 43, 48-50, 54-62, 98, 118-20, Figs. 1-2.

c) Encoding Claim Elements 7[b] and 1[a]

Both Karczewicz '799 and Karczewicz '499 teach using inter-coding to encode a block of pixels, which includes motion estimation and compensation. RX-2021 at ¶¶ 4, 51, 53, Fig. 2; RX-2029 at ¶¶ 4, 6, 54, 56, Fig. 2. These processes determine reference blocks based on motion vectors for a current block, exactly as claimed. RX-2021 at ¶¶ 7, 53, 54; RX-2029 at ¶¶ 4, 56, 58, 73. Karczewicz '799 teaches that bi-directional prediction uses two lists of reference data to predict a current block. RX-2021 at ¶¶ 5, 6, 22, 42, 54.

Karczewicz '499 also teaches that 8 bits (i.e., first precision) are needed to represent possible integer pixel values, which would apply to the current block and first and second reference blocks in the combination. RX-2029 at ¶ 103, Table 5 (“8u” for “integer pixel x”), R-APPX at 25 (Table 5, yellow). RX-2021 at ¶ 7.

d) Encoding Claim Elements 7[c] and 1[b]

The Karczewicz combination uses the first reference block (*e.g.*, block from list 0) to obtain a second prediction (*e.g.*, non-rounded $\text{pred0}(i,j)$). RX-2021 at ¶¶ 7, 24, 44, 48, 53-55, 58, 60; RX-2029 at ¶¶ 60, 97, 101, Tables 2-4; R-APPX at 25. Karczewicz '499 teaches the non-rounded half-pixel predictions (*e.g.*, b_l , h_l) require a 15-bits (*i.e.*, “15s”) to represent these values. RX-2029 at ¶ 103, Table 6; R-APPX at 26 (Table 6, blue). This prediction is obtained through interpolation using P-tap filters, increasing the number of distinct alternatives, consistent with Dr. Richardson's admissions that interpolation results in higher precision. CX-6861 at ¶¶ 93, 114-19.²²

²² Nokia's arguments that the combination does not disclose the claimed invention ignores statements in Karczewicz '799 and '499 that discuss using motion vectors in bidirectional

e) Encoding Claim Elements 7[d] and 1[c]

The Karczewicz combination also uses the second reference block (*e.g.*, block from list 1) to obtain a second prediction (*e.g.*, non-rounded $\text{pred1}(i,j)$), with a second precision (*e.g.*, 15 bits). RX-2021 at ¶¶ 7, 53-54, 58.

f) Encoding Claim Elements 7[e] and 1[d]

In the Karczewicz combination, **non-rounded**($\text{pred0}(i,j)$)+**non-rounded**($\text{pred1}(i,j)$)+32 is the combined prediction. It meets 7[e]/1[d] because it is based on the first prediction (*e.g.*, non-rounded($\text{pred0}(i,j)$)), the second prediction (*e.g.*, non-rounded($\text{pred1}(i,j)$)), and an offset (*e.g.*, 32). RX-2029 at ¶¶ 97, 101, 103, Tables 2, 4, 6; RX-2021 at ¶ 60; R-APPX at 26 (Table 6, blue).

g) Encoding Claim Elements 7[f] and 1[e]

Karczewicz '799 and '499 teach that “>>” is a right shifting operation. RX-2021 at ¶¶ 55, 57, 60; RX-2029 at ¶ 94, 97, 101, 103, Tables 2, 4, 6. Karczewicz '499's right shifting decreases a precision of the combined prediction. In Table 6, operation “ $r1=r1+32$ ” calculates the combined prediction, which has possible values represented by 16-bits (*e.g.*, “16s”). R-APPX at 26 (Table 6, red). The operation “ $r1=r1>>6$ ” in Table 6 shifts the combined prediction 6 bits to the right, with the result having possible values represented by 11-bits (*e.g.*, “11s”). R-APPX at 26 (Table 6, red).

h) Encoding Claim Elements 7[g] and 1[f]

Karczewicz '799 and '499 teach determining residual data (*e.g.*, a residual video block) based on a difference between the combined prediction (*e.g.*, prediction data) and the block of pixels (*e.g.*, original video block). Karczewicz '799 also teaches encoding residual data in a bitstream. RX-2021 at ¶¶ 7, 73-75, 84, 89 Fig. 2; RX-2029 at ¶¶ 4-6, 35, 50, 58, 60-61, 73, 110,

prediction and Karczewicz '499's teachings that “half-pixel values ... may be unrounded values.” RX-2021 at ¶¶ 5-7, 22, 42, 53-54; RX-2029 at ¶¶ 4, 56, 89, 102-03, 106, Table 5.

Fig. 2.

i) Dependent Encoding Claims 8 and 2

These dependent claims are met because Karczewicz '499 teaches obtaining predictions by interpolation using pixel values of reference blocks when motion vectors point to subpixels. RX-2029 at ¶¶ 7, 10, 19, 42, 66-72, 74, 93, Figs. 4A-D.

j) Decoding Claim Elements 25[pre-f] and 19[pre-e]

Decoding claim elements 25[pre] through 25[f] and 19[pre] through 19[e] share commonality with the encoding claim elements discussed above and are disclosed for similar reasons. Additional support for the decoding claim limitations is detailed in the chart below.

Decoding Claim	Analogous Encoding Claim	Additional Decoding Evidence
25[pre]/19[pre]/25[a]	7[pre]/1[pre]/ 7[a]	RX-2021 at ¶¶ 3, 29-30, 33, 39-40, 83-86, 99-100, Figs. 1, 4; RX-2029 at ¶¶ 3, 12, 15, 17, 22-23, 25, 27, 38, 40-41, 44, 48, 50, 63-66, 98, 118-20 Figs. 1, 3.
25[b]/19[a]	7[b]/1[a]	RX-2021 at ¶¶ 5-8, 22, 42, 53-54, 83, 85, 88-89, Figs. 4, 6; RX-2029 at ¶¶ 4, 6, 56, 63, 103, Fig. 3, Table 5; R-APPX at 24-26.
25[c]/19[b]	7[c]/1[b]	RX-2021 at ¶¶ 7, 24-, 44, 48, 53-55, 58, 60; RX-2029 at ¶¶ 103, Table 6; R-APPX at 24-26; CXM-0018 at ¶¶ 93, 114-19.
25[d]/19[c]	7[d]/1[c]	RX-2021 at ¶¶ 7, 53-54, 58.
25[e]/19[d]	7[e]/1[d]	RX-2021 at ¶ 60; RX-2029 at ¶ 103, Table 6.
25[f]/19[e]	7[f]/1[e]	RX-2021 at ¶¶ 55-60; RX-2029 at ¶¶ 94, 103, Table 6; R-APPX at 24-26.

k) Decoding Claim Elements 25[g] and 19[f]

As discussed above, the combination teaches reconstructing the block of pixels based on the combined prediction. Karczewicz '799 teaches the decoder “may invoke adder 79 to combine weighted prediction data (*e.g.*, a prediction block) with residual video data (*e.g.*, a residual block) ... to generate a reconstruction of the video data (*e.g.*, a reconstructed video block).” RX-2021 at ¶¶ 86, 89; Figs. 4, 6; RX-2029 at ¶¶ 6, 65, 111, Figs. 3, 6.

[REDACTED]

l) Dependent Decoding Claims 26 and 20

The combination teaches this additional limitation for the reasons discussed for claims 2 and 8. RX-2029 at ¶¶ 7, 10, 42, 66-72, 74, 93, Figs. 4A-D.

3. RealVideo 9

[REDACTED]

a) Encoding Claim Elements 7[pre], 1[pre] and 7[a]

[REDACTED]

b) Encoding Claim Elements 7[b] and 1[a]

[REDACTED]

[REDACTED]

c) Encoding Claim Elements 7[c] and 1[b]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

d) Encoding Claim Elements 7[d] and 1[c]

[REDACTED]

e) Encoding Claim Elements 7[e] and 1[d]

[REDACTED]

[REDACTED]

f) Encoding Claim Elements 7[f] and 1[e]

[REDACTED]

g) Encoding Claim Elements 7[g] and 1[f]

[REDACTED]

h) Dependent Encoding Claims 8 and 2

[REDACTED]

[REDACTED]

i) Decoding Claim Elements 25[pre-f] and 19[pre-e]

Decoding claim elements 25[pre] through 25[f] and 19[pre] through 19[e] share commonality with the encoding claim elements discussed above and are rendered obvious by RealVideo 9 for similar reasons. Additional support for the decoding claim limitations is detailed in the chart below. Nokia’s expert, Dr. Richardson, argues simply that “Dr. Schonfeld’s opinions with respect to the challenged independent decoding claims of the ’267 Patent recite the same general theory as his opinions with respect to the independent encoding claims ... and fail for the same reasons....” This boilerplate fails for the reasons discussed above in with respect to claims 1 and 7.

[REDACTED]

j) Decoding Claim Elements 25[g] and 19[f]

[REDACTED]

k) Dependent Decoding Claims 26 and 20

[REDACTED]

4. No Secondary Considerations of Non-Obviousness

The ALJ should reject Nokia’s alleged secondary considerations of non-obviousness (commercial success, adoption into the H.265 standard, initial skepticism, unexpected results, failed attempts of others, long-felt but unresolved need, industry recognition and praise, and copying by others). Nokia has provided no evidence supporting these allegations and they have no nexus to the alleged invention of the ’267 Patent.

Nokia offers no evidence that adoption of H.265/AV1 or sales of Respondents’ Accused

[REDACTED]

Products is connected to the '267 Patent. Consumers buy the Accused Products for unrelated reasons, including brand loyalty, price, and customer service. The '267 Patent's lack of commercial success and industry recognition is supported by testimony from Nokia's inventors. RX-1944 at 57:2-10, 58:1-9, 88:3-89:21, 308:21-309:11; RX-1943 at 80:10-81:15, 101:6-129:20. Nokia relies on an HEVC book (RX-0026), but that is not industry praise because the chapters in question were authored by Nokia's own inventors. JX-0025C (Lainema Dep. Tr.) at 146:23-150:21; *In re Cree, Inc.*, 818 F.3d 694, 702 (Fed. Cir. 2016) ("self-serving statements...about their own work" not reliable as industry praise). Another book that Dr. Richardson relies on (CX-6298) fares even worse because it does not even mention the '267 Patent.

Nokia also provided no evidence of initial skepticism, unexpected results, or failed attempts of others. Nor is there any evidence the '267 Patent addressed any long-felt need not already addressed by the prior art. *See, e.g., ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1374 (Fed. Cir. 2018) (no unsolved need where there are minimal differences between prior art and claimed invention).

5. The '267 Patent Is Invalid Under Section 101

The claims of the '267 patent are patent-ineligible because they: (1) cover the abstract idea of deferring rounding until the end of a mathematical operation; and (2) lack an "inventive concept." *Alice Corp.*, 573 U.S. at 217-18.

Claim 2 of the '267 Patent is representative. The four independent claims of the '267 patent may be addressed collectively because they do not "differ in any manner that is material to the patent-eligibility inquiry." *Mortgage Grader*, 811 F.3d at 1324 n.6. All four independent claims recite substantially the same critical limitations, with the remainder of the limitations being conventional. JX-0007, cls. 1, 7, 19, 25. The asserted dependent claims of the '267 patent recite

conventional interpolation functionality. JX-0007, cls. 2, 8, 20, 26. Thus, claim 2 of the '267 patent is representative.

Alice, Step One: The claims of the '267 Patent are directed to the abstract idea of **deferring rounding until the end of a mathematical operation**. The '267 patent makes clear that its alleged improvement over the prior art is waiting to reduce “precision” until after multiple predictions have been combined into a combined prediction. *E.g.*, JX-0007 at 13:43-55, Figs. 10, 11; *Solutran, Inc v. Elavon, Inc.*, 931 F.3d 1161, 1168 (Fed. Cir. 2019) (noting the *Alice* step 1 inquiry focuses on “what the patent asserts to be the focus of the claimed advance over the prior art”). The '267 patent further explains that delaying precision reduction makes “possible rounding errors have a smaller effect to the prediction signal compared to existing methods” JX-0007 at 13:52-55. The '267 patent asserted claims are therefore directed to the abstract idea of deferring rounding until the end of a mathematical operation, which is a fundamental mathematical concept. JX-0007 at 3:50-55, 7:31-8:17, 8:52-9:2, Figs. 3, 4a; JX-0187; *In re Gitlin*, 775 F.App’x 689, 691 (Fed. Cir. 2019) (“The Supreme Court has established that a mathematical concept without more does not constitute patent-eligible subject matter.” (citing *Parker v. Flook*, 437 U.S. 584, 587-96 (1981))); *Burnett v. Panasonic Corp*, 741 F.App’x 777, 780-83 (Fed. Cir. 2018) (finding claims patent-ineligible when directed to the mathematical methodology of “using a formula to convert geospatial coordinates into natural numbers”).

Nokia’s expert, Dr. Richardson, argues that Dr. Schonfeld’s characterization of the claims “oversimplifies them and ignores their context” because, in his view, they recite non-abstract bi-prediction functionality. However, the remainder of the '267 patents’ claims are directed to generic video encoding and decoding, which is itself abstract. *RecogniCorp, LLC v. Nintendo Co., Ltd.*, 855 F.3d 1322, 1323-28 (Fed. Cir. 2017) (concluding addition of a mathematical formula to claims

[REDACTED]

directed to “standard encoding and decoding” does not render claims non-abstract). Further, “limit[ing] the abstract idea to a particular environment [*i.e.*, bi-prediction] . . . does not make the claims any less abstract for the step 1 analysis.” *In re TLI Commc’ns LLC Pat. Lit.*, 823 F.3d 607, 613 (Fed. Cir. 2016). Moreover, Dr. Richardson provides no explanation as to how the ’267 patent improves computer function. Even if the ’267 patent’s methods were to improve a user’s viewing experience, such an improvement is insufficient to make the claims non-abstract. *See, e.g., Customedia Techs., LLC v. Dish Ntwk. Corp.*, 951 F.3d 1359, 1365 (Fed. Cir. 2020) (“We have also held that improving a user's experience while using a computer application is not, without more, sufficient to render the claims directed to an improvement in computer functionality.”).

Alice, Step Two: The claims of the ’267 Patent lack an inventive concept. The asserted claims of the ’267 patent recite video coding functions and components that were well-known, routine and conventional, both individually and as an ordered combination. The asserted claims recite the following conventional features/steps: (1) processor, (2) memory, (3) computer program code, (4) determining reference blocks using motion vectors, (5) using reference blocks to obtain predictions, (6) obtaining combined predictions, (7) decreasing precision of combined predictions by shifting bits to the right, (8) encoding residual data, (9) reconstructing a block of pixels, and (10) subpixel interpolation. JX-0007 at 1:52-59, 2:1-12, 2:60-3:11, 4:29-35, 13:43-55, 17:14-18:12, Figs. 10, 11, cls. 1, 2, 7, 8, 19, 20, 25, 26; JX-0181C at 163:7-166:9, 181:22-182:5, 207:3-5, 207:16-18; 207:19-22, 236:16-237:9; JX-0187, RX-2024 at 16:54-17:17. The prior art further shows that these features/steps are conventional. *See* Walker + Srinivasan, Karczewicz + Karczewicz, RealVideo 9 grounds, *supra*. These generic elements do not add an “inventive concept” to the claims, either individually or as an ordered combination.

[REDACTED]

Dr. Richardson does not dispute that the aforementioned elements are conventional, instead arguing that the '267 patent is a “notable departure from routine and conventional practices,” which “limit the steps performed at higher precision.” In essence, Dr. Richardson argues that deferring rounding until the end of the bi-prediction process—the abstract idea—supplies an “inventive concept.” However, the law is clear that an abstract idea cannot provide an “inventive concept.” *See, e.g., Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 967 F.3d 1285, 1299 (Fed. Cir. 2020) (collecting cases).

VIII. THE ASUS AND ACER REDESIGN PRODUCTS DO NOT INFRINGE

The evidence will demonstrate that the ASUS and Acer redesigned products do not infringe the asserted claims.

As an initial matter, it is important to note Nokia has not accused all encoding and decoding of H264, H265, and AV1. Rather, Nokia has accuses only *hardware accelerated* encoding and decoding of H264, H265, and AV1. Put differently, Nokia has not accused non-hardware accelerated encoding and decoding of H264, H265, and AV1.

The ASUS and Acer redesign products disable the accused hardware accelerated encoding and decoding of H264, H265, and AV1 such that any encoding and decoding of H264, H265, and AV1 would not be hardware accelerated. The ASUS and Acer redesigns use the same approach to disabling hardware accelerated encoding and decoding of H264, H265, and AV1. [REDACTED]

[REDACTED] ASUS made the following redesign products available for inspection:

[REDACTED]

For Acer, the following samples were made available for inspection:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

■ In this way, the redesign configures the Accused Products to disable the accused hardware accelerated encode and decoding of H264, H265, and AV1.

Critically, Nokia does not dispute that ASUS's and Acer's redesigns successfully disable the accused hardware accelerated encoding and decoding of H264, H265, and AV1. Rather, Nokia contends that the redesign around could be easily reversed, making the redesign products reasonably capable of infringement. Nokia's position, however, is not supported by the record evidence.

First, Nokia's failed attempts at reversing the redesign products demonstrate that they are not reasonably capable of infringement. In total, Nokia contends that it successfully reversed four ASUS redesign machines and one Acer redesign machine. ASUS and Acer, however, made *fourteen* redesign machines available for inspection. And Nokia ignores that it took a total of six days of inspection (three days each for ASUS and Acer) to reverse the machines that it did. These facts, no matter how they are considered (e.g., five of fourteen successfully reversed in total or four of eleven successfully reversed or three days effort to reverse four machines), demonstrate that the redesign machines are not reasonably capable of infringement.

Second, Nokia's attempts of reversing the redesign products involved *significant modification* of the redesign products. Based on screenshots of Nokia's attempts, [REDACTED]

[REDACTED] The modifications Nokia attempted, however, are not trivial and may lead to system errors. RX-2235 – RX-2241. For

[REDACTED]

example, both ASUS and Acer warns against the modifications attempted by Nokia. *Id.* Moreover, modifications by Nokia yielded errors in the system. *Id.*

Third, Nokia’s arguments about deactivating the redesign ignore the claims-at-issue and what is required under the law. Notably, the accused apparatus claims recite the requirement “computer program code configured to.” It is well established Federal Circuit precedent that “configured to” or “adapted to” require more than mere capability. *Aspex Eyewear, Inc.*, 672 F.3d at 1349 (distinguishing between “configured to” and “having the capacity to,” and between “configured to” and “capable of”); *Sta-Rite Indus., LLC v. ITT Corp.*, 682 F. Supp. 2d 738, 753 (E.D. Tex. 2010) (“[T]he Court construes the term ‘adapted to’ to mean ‘*designed or configured to*’” (emphasis added)); *Boston Sci. Corp. v. Cordis Corp.*, No. C 02-1474, 2006 WL 3782840 at *2 (N.D. Cal. 2006) (“A widely accepted dictionary definition of the word ‘configure’ means ‘[t]o design, arrange, set up, or shape with a view to specific applications or uses.’”). In arguing that the redesigns are “reasonably capable” of infringement after they have been modified by having different software (i.e., computer program code) installed, Nokia changes the scope of the claims and flouts what is required under the law.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Fifth, Nokia is wrong to argue that future updates from the processor suppliers could revert the redesign. [REDACTED]

[REDACTED]

Sixth, it is notable that Nokia is *relying on* the redesign being effective in its RAND and public interest analysis. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

IX. ECONOMIC PRONG – DOMESTIC INDUSTRY

A. Legal Standards

The economic prong of the domestic industry requirement is met when complainant can show—with respect to articles protected by the patent—any of the following: (A) significant investment in plant and equipment; (B) significant employment of labor or capital; or (C) substantial investment in its exploitation, including engineering, research and development, or licensing. 19 U.S.C. § 1337(a)(3); *Certain Integrated Circuits, Chipsets and Prods. Containing*

[REDACTED]

Same, Inv. No. 337-TA-428, Order No. 10 (May 4, 2000). For subprongs (A) and (B), the focus is on domestic investments for articles protected by the patent. 19 U.S.C. § 1337(a)(3). For subprong (C), the complainant must show a nexus between the claimed investment and asserted patent. *Certain Integrated Circuit Chips and Prods. Containing the Same*, Inv. No. 337-TA-859, Comm’n Op. at 38, 48 (Aug. 22, 2014) (“*Integrated Circuit Chips*”).

“The purpose of the domestic industry requirement is to prevent the ITC from becoming a forum for resolving disputes brought by foreign complainants whose only connection with the United States is ownership of a U.S. patent.” *Certain Battery-Powered Ride-On Toy Vehicles*, Inv. No. 337-TA-314, USITC Pub. No. 2420, ID. at 21 (Aug. 1991). The Commission counts only certain activities to ensure its strong trade remedy is only issued to protect domestic industries and not entities that are mere paper patent holders. *See* H.R. Rep. No. 40, 100th Cong., 1st Sess., at 157-58 (1987). It is the complainant’s burden to show by a preponderance of the evidence that the domestic industry requirement is met. *See, e.g., Certain Multimedia Display and Navigation Devices and Systems, Components Thereof and Prods. Containing Same*, Inv. No. 337-TA-694, Corrected Comm’n Op. at 5 (Aug. 8, 2011).

Not all domestic investments count toward the domestic industry requirement—they must be made “with respect to” the articles protected by the patent or patents at issue in the Investigation. Investments that are too attenuated from the domestic industry product or that are not directly attributable to the domestic industry products cannot be used to satisfy the economic prong of the domestic industry requirement. *See, e.g., Certain Subsea Telecoms. Sys. and Components Thereof*, Inv. No. 337-TA-1098, Comm’n Op. at 41 (Oct. 21, 2019) (“*Subsea Telecoms.*”); *Certain Video Game Systems and Wireless Controller and Components Thereof*, Inv. No. 337-TA-770, Comm’n Op. at 56-57 (Oct. 28, 2013) (“*Video Game Systems*”).

[REDACTED]

The Commission examines whether the alleged domestic activities and investments “are important to the articles protected by the asserted patents in the context of the company’s operations, the marketplace, or the industry.” *Certain Network Devices, Related Software and Components Thereof (II)*, Inv. No. 337-TA-945, ID at 279-80 (Jan. 9, 2017). “The word ‘significant’ denote[s] ‘an assessment of the relative importance of the domestic activities. *Lelo Inc. v. ITC*, 786 F.3d 879, 883-884 (Fed. Cir. 2015) (quoting *Certain Concealed Cabinet Hinges and Mounting Plates*, Inv. No. 337-TA-289, Comm’n Op. at 11 (Jan. 8, 1990)); see also *Certain Carburetors and Prods. Containing Such Carburetors*, Inv. No. 337-TA-1123, Comm’n Op. at 17 (Oct. 28, 2019) (“*Carburetors*”) (finding significance may not be established by absolute values and requires assessing relative importance of domestic activities). In evaluating significance, the Commission considers a wide variety of factors, such as the value added by domestic activities, a comparison of domestic and foreign investments, and comparison of domestic industry investments to sales of domestic industry products. *Carburetors*, Inv. No. 337-TA-1123, Comm’n Op. at 17-20.

B. Summary of Nokia’s Domestic Industry Allegations

Because Nokia has no patent-practicing products or investments of its own, it relies on alleged activities of its licensees, Microsoft and Samsung, to satisfy the economic prong under both subsection (A) (plant and equipment) and subsection (B) (labor and capital). But Nokia does not rely on activities specifically related to the video coding standards and technologies at issue in this investigation or to chipsets or software that enable this technology. Instead, Nokia relies on its licensees’ investments in downstream, multi-function products—certain Samsung Galaxy products (“Samsung DI Products”) and certain Microsoft Surface products and certain Microsoft Xbox video game consoles (“Microsoft DI Products”). For example, Mr. Herrington is expected

[REDACTED]

to testify that from 2020-2025 Microsoft expended over [REDACTED] in domestic plant and equipment and over [REDACTED] in domestic R&D labor related to the Microsoft DI Products. Similarly, Mr. Herrington is expected to testify that from 2021-2025 Samsung expended approximately [REDACTED] in domestic plant and equipment and [REDACTED] in domestic labor relating to the Samsung DI Products.

The problem for Nokia is that these admittedly large sums are irrelevant, because Nokia has focused on the wrong products. Recent Commission precedent demonstrates that Microsoft's and Samsung's investments in downstream products that happen to utilize the patented technology are not cognizable to satisfy the economic prong. Neither the patented technology here nor the components that enable such technology to be used in the Microsoft and Samsung DI Products was developed or manufactured by Microsoft or Samsung. Rather, the articles alleged to practice the Asserted Patents here are chipsets and software (the Android OS) that were designed, developed, and sold by other companies—Intel, AMD, NVIDIA, Qualcomm, MediaTek, and Allwinner for the chipsets, and Google for the Android OS. Microsoft and Samsung merely purchase or acquire these alleged patent-practicing articles and incorporate them into downstream products. (Unsurprisingly, Microsoft and Samsung have not produced any source code relating to these chipsets or the Android OS.)

Nokia's efforts to maximize the royalty base for its SEP licenses and extract maximum holdup value from the industry means that it refuses to offer licenses to chipset providers, instead choosing to license only end products.²³ Thus, Nokia is not able to rely on any of these companies' investments in these chipsets or the Android OS. [REDACTED]

²³ See, e.g., Brief of Amicus Curiae Nokia Techs. Oy in *FTC v. Qualcomm Inc.*, No. 19-16122, Dkt. No. 98 (Aug. 30, 2019).

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] As explained below, under the facts here, that approach is foreclosed by Commission precedent.

C. The Alleged DI Products Are Not the Appropriate Article of Commerce

Indeed, *none* of the alleged DI Products here is the appropriate article of commerce under Commission precedent. The Commission examines the domestic industry from the standpoint of whether the relevant investments “relate to” or are “with respect to” the articles protected by the asserted patents. This inquiry is a fact-specific, case-by-case determination and depends upon how the complainant’s domestic investments are connected to the articles that are protected by the asserted patents in the context of the realities of the marketplace.

The Commission has set forth three factors to consider in determining whether the realities of the marketplace support finding that investments other than in the patented technology or patented article may be considered investments “with respect to articles protected by the patent”: (1) whether the patented technology is sold as a separate entity or article of commerce; (2) whether it is an essential component of the downstream product; and (3) whether the domestic industry activities have a direct relationship to exploitation of the patented technology. *Certain Active Matrix Organic Light-Emitting Diode Display Panels and Modules for Mobile Devices, and Components Thereof*, Inv. No. 337-TA-1351, Comm’n Op. (Remand) at 18 (Apr. 9, 2025) (“*Certain AMOLED Panels*”). “In sum, the Commission has credited domestic investments when they are made with respect to an ‘essential,’ necessary,’ and/or ‘integral’ part of the article covered by the patent claims and/or is ‘central to enabling’ exploitation of the article covered by the patent claims.” *Certain Magnetic Tape Cartridges & Components Thereof*, Inv. No. 337-TA-1058,

[REDACTED]

Comm’n Op. at 50 (Apr. 9, 2019) (“*Magnetic Tape Cartridges*”). Commission precedent expanding the domestic industry to include investments in downstream products involves circumstances under which exploitation of the patented technology can be achieved *only* through sales of the downstream product. *Magnetic Tape Cartridges*, Inv. No. 337-TA-1058, Comm’n Op. at 56; *Certain Sleep-Disordered Breathing Treatment Sys. and Components Thereof*, Inv. No. 337-TA-890, ID at 149 (Aug. 21, 2014) (“*Sleep-Disordered Breathing Treatment*”); *Certain Personal Computers and Components Thereof*, Inv. No. 337-TA-140, USTIC Pub. 1504, Comm’n Op. at 41 (Mar. 9, 1984) (“*Personal Computers*”).

As explained below, applying these factors, the domestic industry should be limited to the alleged patent-practicing articles of the chipsets and the Android OS, and Nokia’s attempt to expand domestic industry to include the downstream products should be rejected.

1. Factor 1

The first factor relates to whether the patent-practicing article is sold as a separate article of commerce. Here, as Respondents’ expert Dr. Seth will explain, the patent-practicing chipsets and Android OS are third-party products available for sale or free acquisition in the market from third parties Intel, AMD, NVIDIA, Qualcomm, MediaTek, and Allwinner (for the chipsets) and Google (for the Android OS).²⁴ And as explained above, they are merely purchased by Microsoft and Samsung, who incorporate these products into DI Products to provide consumers with video coding functionality (among other things), showing that the “degree of connection between the patented technology and the downstream [] DI products is not as strong.” *Certain AMOLED Panels*, Comm’n Op. at 25 (finding that this factor weighed against considering investments in the downstream DI products as investments “with respect to articles protected by the patents”).

²⁴ See, e.g., Ex. RX-1544; RX-1512; RX-1561; RX-1524.

[REDACTED]

Mr. Herrington is expected to testify that the first factor favors Nokia, because neither Nokia, Microsoft, nor Samsung sells the chipsets or Android OS to the end consumer.” But under the first factor, the relevant inquiry is not whether *Nokia and/or its licensees* specifically sell these components as separate articles of commerce; rather, it is whether these components are separately sold or provided in commerce *by anyone*—which they are. As noted above, these components are each designed, developed, and sold by entities other than Microsoft or Samsung. Indeed, in the 1380 investigation, the ALJ found that “the chipsets in the Surface and Galaxy DI products are most decidedly separate articles of commerce” because there, “the evidence show[ed] that Microsoft and Samsung purchase pre-designed and commercially available patent-practicing chipsets from non-parties Intel, AMD, NVIDIA, and Qualcomm.” *Certain Video Capable Electronic Devices, Including Computers, Streaming Devices, Televisions, and Components and Modules Thereof*, Inv. No. 337-TA-1380, ID at 159 (Dec. 20, 2024).

Mr. Herrington is also expected to testify that this factor favors Nokia because the components purchased from third parties do not encode or decode video without incorporation into an end user device, such as the DI Products. But while it may be *technically* correct that these components do not function until incorporated into an end-user device, that unremarkable fact does not support Nokia. Indeed, the Commission rejected a similar function-based argument asserted by the complainants in *Certain AMOLED Panels*. See *Certain AMOLED Panels*, Comm’n Op. at 22-23, 26 (rejecting Complainant’s argument that “this factor favors inclusion of investments in the Galaxy DI Products because the ‘Galaxy DI Products provide the *only* avenue for the AMOLED DI Products to operate properly and exploit the benefits of the Asserted Patents.’”).

Finally, Mr. Herrington is expected to testify that the first factor favors Nokia because the components are not intended to be removeable or replaced by an end user, and that they are

[REDACTED]

“customized” for Microsoft and Samsung. Mr. Herrington’s opinion on this issue misses the point for several reasons.

First, the first factor concerns whether the patented technology is sold as a separate article of commerce, *not* whether it is permanently or removably attached to a downstream device. As explained above, there is no dispute that the chipsets and software allegedly containing the patented technology are sold and provided separately by third parties.

Second, Mr. Herrington’s customization arguments are undermined by the Commission’s recent precedent in *AMOLED Panels and Modules*. There, the Commission noted that the customization work at issue was “not unique” and that the complainant “perform[ed] similar customization work for other OEM customers.” *Id.* at 23. The alleged customization-related activities in *AMOLED Panels* were unrelated to the functionality embodied in the asserted patents. So too here.

For example, Mr. Herrington is expected to rely on alleged customization work that AMD, Intel, and Qualcomm perform in collaboration with Microsoft for the Microsoft DI Products. But such work is neither unique nor relates to the functionality of the Asserted Patents. For example, Dr. Seth will testify that AMD performs customization work not only for Microsoft DI Product Xbox, as alleged by Mr. Herrington, but *also* for Sony’s PlayStation 4 gaming consoles.²⁵ She will also explain that AMD has built a “semi-custom SoC” to power a gaming PC and console in China²⁶ and that AMD’s Annual Form 10-K filings emphasize that their alleged customization and/or collaboration with Microsoft is not limited to the Microsoft Xbox DI Product, and is instead broadly used with many customers for various products, including the Sony PlayStation 5 and

²⁵ See also Ex. RX-1513.

²⁶ See also Ex. RX-1511.



Valve Steam Deck PC (which are both non-DI Products), among others. The components for many of the Microsoft Surface DI Products on which Nokia relies are also sold by Intel to other OEMs and also readily available for purchase, including on websites such as Amazon.com. While Mr. Herrington and Nokia rely on the notion that the Microsoft SQ[®] 3 processor incorporated in the Surface Pro 9 5G was “built in partnership with Qualcomm,”²⁷ Respondents’ experts will explain that there is no evidence that creating this “custom processor” involved customization of the video-coding technology related to the Asserted Patents. *See also Certain Video Capable Electronic Devices*, ID at 162 (“Moreover, according to Nokia, what modifications Samsung does make are not related to the encoding/decoding techniques of the Asserted Claims.”). Indeed, Dr. Hemami will explain that because the H.264 and H.265 standards have been there for so long, one must use third-party software to encode according to the standard, and the hardware implementation is like a “commodity.” Any assertion that the customization activities on which Nokia and Mr. Herrington rely has to do with video coding technology is not supported by the record.

Mr. Herrington is also expected to testify that many Samsung devices include custom-made Qualcomm chips, but the evidence will show that Qualcomm sells these chips to many other non-Samsung entities for use in their phones. And Mr. Herrington’s reliance on certain license agreement between Qualcomm and Samsung as evidence of customization fares no better. As Dr. Seth will explain, there is no indication that the work being contemplated in the agreements is related in any way to customization of specific chips used in any of the Samsung Galaxy products or that the purpose of the agreements relate to any Samsung DI Products. While Mr. Herrington also attempts to rely on the alleged customization of the Android OS by Samsung, Android OS is

²⁷ Ex. RX-1589.

[REDACTED]

customized by not only Samsung, but also many other smartphone makers. Indeed, Android OS is publicly accessible open-source software that is commonly modified by various phone manufacturers. Dr. Schonfeld and Dr. Seth will also explain the particularly relevant fact that the AV1 and VP9 video-coding technology that comes with Android cannot be modified.

Mr. Herrington is also expected to rely alleged customization between Samsung and Google, insofar as Samsung may conduct testing related to the ability to stream video on SEA mobile devices.” But Dr. Schonfeld will explain that testing the *ability to stream* is neither the same as customizing a component nor is such testing related to the features allegedly enabled by the Asserted Patents.

At bottom, there is no indication that any of customization work cited by Mr. Herrington is related in any way to the functionalities described in the Asserted Patents, which is what is required by Commission precedent emphasizing that the focus on the *Magnetic Tapes* analysis “must remain on the patented technologies,” including with respect to any alleged customization. *See, e.g., Certain AMOLED Panels*, Comm’n Op. at 26 (“the focus of the second factor must remain on the patented technologies *like the first factor*”) (emphasis added).

2. Factor 2

The second factor is generally characterized as whether the patent-practicing article is “essential” to the downstream product, but as the Commission recently clarified in *Certain AMOLED Panels*, the factor is focused on whether the downstream product is necessary for exploitation of the patented technology and whether there is an “exclusive operational relationship” between the patent-practicing article and the downstream product.

Dr. Schonfeld, Dr. Hemami, and Dr. Seth will explain that the components here (the chipsets and Android OS) are not necessary for the exploitation of the patented technology and that there is no exclusive operational relationship between those components and the DI Products.

[REDACTED]

Specifically, Dr. Schonfeld and Dr. Hemami will explain that while the DI Products *do* need *some* type of chipset or software to provide video-coding technology, they *do not* need the *specific* third-party chipsets or software at issue here. Indeed, the video-coding technology could be offered through different chipsets or software, and the DI Products could be readily modified to use these other components.

Moreover, the relevant question based on Commission precedent is whether the patent-practicing article and downstream product are part of a proprietary and exclusive system such that the patent-practicing article could not and would not be exploited without the downstream product. *Magnetic Tape Cartridges*, Comm’n Op. at 56; *see also Personal Computers*, Comm’n Action and Order at 41; *Sleep-Disordered Breathing Treatment*, ID at 149-50. Respondents’ experts will explain that laptops, tablets, gaming consoles, and smartphones need processors and OS to operate in the same way that such products need other components, like hard drives, RAM, power sources, and displays, and neither the chipsets nor the Android OS has an exclusive operational relationship with the downstream Microsoft and Samsung DI Products. Furthermore, Respondents’ experts will explain that incorporating these components into the DI Products is not the exclusive means for exploitation of the Asserted Patents, as the video-coding technology at issue can also be implemented via that is not accused in this Investigation. And as explained above, even if the Components are customized in some instances, the required exclusive operational relationship is missing because: (1) there is no evidence that the custom component relates to the functionality of the Asserted Patents and (2) the custom Component is not the exclusive means for exploitation of the Asserted Patents.

Indeed, Nokia’s expert Mr. Herrington has not—because he cannot—opined that an exclusive operational relationship exists between the Components and the alleged DI Products.

[REDACTED]

Instead, he is expected to bases his factor two analysis primarily on his opinion that (1) the chipsets and Android OS need a downstream product to function and the DI products need these components to function, and (2) consumers widely demand the ability to encode and decode video in a wide variety of formats, including the standards accused in this Investigation. But both of these arguments were roundly rejected by the Commission just last year in *Certain AMOLED Panels*. First, the mere fact that the DI products “cannot function” without the type of component is not relevant—they likewise could not function without a power cord or a display screen. *See Certain AMOLED Panels*, Comm’n Op. at 25-26 (“The ID found this factor favored including SEA’s investments in the Galaxy DI Products because the AMOLED DI Products are “essential components” of the Galaxy DI Products and because the phones cannot function without the AMOLED DI Products. . . We disagree with the ID’s assessment of this factor.”). The focus is whether the *particular* components are essential—and as explained above, they are not. Additionally, the mere fact that the patented inventions are in demand from consumers or “provide benefits especially valuable for mobile devices” is not enough, because here, as in *Certain AMOLED Panels*, “the record shows the patented technologies are also used in consumer products other than” the DI Products. *Id.* at 23-24 (“Thus, the evidence shows that while the patented technology is useful for smartphones, the technology can also be used, and there is a market for, the patented technology in consumer products other than smartphones.”) Respondents’ experts will explain that video-coding technology is used in a wide variety of products far beyond those relied on by Nokia for DI purposes. Factor two thus favors Respondents.

3. Factor 3

The third and final factor relates to whether the domestic activities have a direct relationship to the exploitation of the patented technology. *Magnetic Tape Cartridges*, Comm’n Op. at 50. Nokia fails to demonstrate that there is any relationship—let alone a “direct” one—

[REDACTED]

between the domestic activities for which it calculates investments and exploitation of the patented technology, which relates to minor features of the H.264, H.265, and AV1 standards. Nokia makes no effort to allocate investments in either the Microsoft DI Products or the Samsung DI Products to integration of the patent-practicing articles in the downstream products or implementation of these minor features.

As Respondents' experts will explain, the facts surrounding this factor—like factors 1 and 2 above—weigh against defining the domestic industry to include investments in the Microsoft or Samsung DI Products because Nokia's claimed investments are not directly related to the exploitation of the patented technology. *Certain AMOLED Panels*, Comm'n Op. at 29 (rejecting complainant's argument that the ID erred in requiring that the specific DI investments "be necessary to exploit the patented technology in order to find that investments in the [] DI Products are part of the domestic industry" and explaining that "Commission precedent supports looking at the relationship between domestic activities and investments and the articles protected by the patent"). Respondents' experts will also explain that the patented technology can be exploited in products other than the Microsoft or Samsung DI Products (such as the Sony PlayStation and/or Valve Steam Deck PC, for example). *Id.* at 29-30 (finding the relied-upon activities to "have no connection to the patented display technologies" and noting that the complainant "can and does commercially exploit its patents in smartphones and consumer products other than the [] DI Products."). Indeed, Respondents' experts will explain that Nokia's assertion that the patented technology is standard-essential further suggests that the claimed investments in the downstream DI Products—which rely on these third-party components for the standard-essential functionality—are unrelated to the patented technology. *See also Certain Video Capable Electronic Devices*, ID at 163-64 ("As discussed at length above, the technology of the Asserted

[REDACTED]

Patents involves specific techniques to improve a computer’s ability to encode and decode video streams. Nokia does not even allege that Microsoft or Samsung perform R&D or other work into this functionality. Nor would they. Nokia’s theme of the investigation is that these techniques are settled in standards utilized by the industry as a whole”).

Mr. Herrington is expected to testify that because the entire DI Products as a whole practice the claims of the Asserted Patents, all “qualifying” activities associated with the DI Products would *necessarily* have a relationship to the exploitation of the patented technology under this factor. Furthermore, Mr. Herrington is expected to testify that certain collaboration activities between Microsoft and Qualcomm and certain Android-related activities from Samsung support his view that factor 3 weighs in favor of the Microsoft and Samsung DI Products being the appropriate articles of commerce. But neither Mr. Herrington nor Nokia will be able to present any evidence that the Microsoft-Qualcomm collaboration, the Samsung Android customization, or any other quantifiable investments from Microsoft or Samsung had any relationship with H.264, H.265, or AV1 video coding, let alone the specific the functionality allegedly enabled by the Asserted Patents. And Mr. Herrington makes no effort to allocate expenditures in the Microsoft or Samsung DI Products specifically related to the customization or integration of the third-party chipsets into the downstream products, instead relying on and counting investments that far exceed any such activities.

Again, the Commission’s recent opinion in *Certain AMOLED Panels* is instructive. There, the Commission determined that the evidence did not specifically show significant investments relating to “customization” of components “to ensure compatibility with” the downstream products, and instead improperly included investments that did not specifically relate to the “incorporation of the display into the phone.” *Id.* at 28. Here, as in *Certain AMOLED Panels*, the

[REDACTED]

domestic activities relating to the downstream products are too “far removed from the patented technologies,” meaning that the third factor “weighs against broadening the investments in domestic industry to include the [] DI Products.” *Id.*

4. Conclusion Regarding Article of Commerce

The facts of this Investigation bear a striking resemblance to those in *Certain AMOLED Panels*, where the complainant was found to have focused on the wrong domestic industry product and therefore failed to carry its burden on the economic prong. The same result should occur here. Nokia took no discovery into and does not identify investments by Microsoft or Samsung related to the actual patent-practicing articles. As Respondents’ experts will testify, Nokia’s experts present no evidence that adding the hardware or software for supporting H.264, H.265, and/or AV1 required any special effort from Microsoft or Samsung engineers. And Nokia’s experts will present no evidence that adding or supporting these video coding standards takes anything beyond what would have been required to integrate any other hardware or software features of the third-party chipsets or Android OS.

Based on the realities of the marketplace in this Investigation, the domestic industry should be limited investments in the proper patent-practicing articles of commerce—here, the third-party chipsets or Android OS. To the extent Nokia is permitted to rely on *any* investments by Microsoft and Samsung, they should be limited to investments necessary for and directly related to the exploitation of the patented technology (for example, incorporation of these chipsets and the Android OS into the DI Products).

Because Nokia did not even attempt to meet its burden to show a domestic industry related to the actual patent-practicing articles, the ALJ should find that it does not satisfy the economic prong.



D. Nokia Fails to Appropriately Allocate or Connect Its Licensees' Expenses to DI Products

The portion of Section 337 addressing the domestic industry requirement mandates that the relied-upon activities and investments are “relating to” and are made “with respect to” the articles protected by the patent. 19 U.S.C. § 1337(a)(2)-(3). Even beyond the issues outlined above concerned the article of commerce, Nokia fails in its burden to satisfy the economic prong of the domestic industry requirement with respect to its own definition of the DI Products because it fails to properly allocate or establish a connection between the corpus of alleged DI investments and the DI Products.

For example, Dr. Seth will explain that Mr. Herrington fails to establish a connection between the DI Products and the claimed expenditures. In particular, it appears that a significant amount of claimed expenditures are likely not for the DI Products themselves, but for *future* products not on the market during the DI Period. This is particularly stark for the Microsoft Surface DI Products—as Dr. Seth will explain, the Microsoft R&D expenditures on which Mr. Herrington relies are for the development of future products and not for DI Products currently on the market. By definition, these expenditures do not relate to “articles protected by the patents.” Moreover, several DI Products from both Microsoft and Samsung were released near the start of the DI Period and/or are updated versions of products that were released many years before. This means that much of the R&D expenditures associated with these DI Products were incurred prior to the DI Period, and the DI expenditures Mr. Herrington claims likely inappropriately include development costs for future products that are not “articles protected by the patent.”

Dr. Seth will also explain that Mr. Herrington’s allocation methodology is flawed and inappropriate under the facts and circumstances of this case. Mr. Herrington uses a sales revenue-based allocation to allocate the alleged Microsoft and SEA R&D related expenditures, 

[REDACTED]

[REDACTED] related expenditures, and [REDACTED] related expenditures.

Dr. Seth will testify that such a sales revenue-based allocation methodology is improper here for two reasons. First, due to the temporal offset between R&D related expenditures and sales revenues, many of the expenses Mr. Herrington is allocating to the DI Products were likely not made “with respect to” the DI Products. Second, the different R&D activities may contribute differently to the generation of sales revenues—*i.e.*, Mr. Herrington has not established that the connection between R&D activities and sales revenues is sufficiently direct to use sales revenue as an allocator for R&D activities. These errors mean that Mr. Herrington overstates the DI expenses (in some cases in excess of 50%) and renders his analysis unreliable.

Furthermore, Dr. Seth will testify that Mr. Herrington does not rely upon sufficient documentation to substantiate the amounts across many categories of expenses included within his calculations. [REDACTED]

[REDACTED] Mr. Herrington is also expected to testify that [REDACTED] [REDACTED] is primarily involved in significant R&D and product management associated with Samsung mobile product functionalities such as [REDACTED] and the [REDACTED] store. But Dr. Seth will explain that contrary to this testimony, the underlying data produced by Samsung itself indicates that majority of the work conducted by this group is related to [REDACTED] [REDACTED]—a different line of business for SEA—and that expenditures related to [REDACTED] have actually been negative in recent years.

E. Nokia Fails to Establish Significance of Its Alleged DI Investments

Finally, even assuming that Nokia has appropriately allocated the alleged domestic industry investments to the proper domestic industry products—which, as outlined above, it has not done—Nokia must show that the alleged domestic industry investments are qualitatively and

[REDACTED]

quantitatively significant. *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm’n Op. at 26 (Feb. 17, 2011) (“*Imaging Devices*”). Quantitative significance requires assessing the relative importance of the domestic activities, such as by considering the value add from domestic activities, comparing domestic and foreign investments, and comparing domestic industry investments to sales of domestic industry products. *Carburetors*, Comm’n Op. at 17-20. The Commission further considers “the nature of complainant’s activities to determine whether they are directed to the practice of one or more claims of the asserted patent.” *Imaging Devices*, Inv. No. 337-TA-690, Comm’n Op. at 28 (no evidence of “whether complainant’s undertakings had a direct bearing on the practice of the patent”); *Concealed Cabinet Hinges*, Comm’n Op., 1990 ITC LEXIS 3, at *23 (“Because of the indirect bearing on the patented features of the [product],” the Commission gave less weight to complainant’s investments relating to adding an optional dowel to the imported product); *Certain Plastic Encapsulated Integrated Circuits*, Inv. No. 337-TA-315, ID at 90 (Nov. 1992) (significance inquiry included whether activities relate to something covered by the patent).

Nokia cannot show that any alleged domestic industry investments in the Samsung or Microsoft DI Products are directed to *any* aspect of the Asserted Patents, let alone show that they are qualitatively significant. The domestic plant and equipment and labor and capital investments identified by Nokia have nothing to do with video coding and no domestic activities required by any claim limitation or directed to practice of the claims of any Asserted Patent.

1. Microsoft

Mr. Herrington is expected to testify that Microsoft’s domestic R&D investments led to the launch of the Microsoft Xbox DI Products and the Microsoft Surface DI Products, which would not exist without such investments. But Dr. Seth will explain that the Microsoft Xbox X and S series first launched many years ago, just a few months into the start of the Microsoft DI Period—

[REDACTED]

indicating that the vast majority of such investments occurred *prior to* the Microsoft DI Period. So too for the Microsoft Surface DI Products, the first generation of which was launched as early as 2013. Mr. Herrington fails to evaluate how these years-old commercial innovations of Microsoft are qualitatively significant during the limited DI Period at issue here. Moreover, Mr. Herrington also overlooks Mr. Christopoulos’s testimony that the R&D investments on which he relies do not relate to the DI Products themselves and instead to the development of future products, showing that they are not “qualitatively significant” to the Microsoft DI Products.

Regarding quantitative significance, because the DI investments on which Mr. Herrington relies are vastly overstated for the reasons above, his analysis is necessarily unreliable. But even taking his numbers at face value, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

2. Samsung

Mr. Herrington is expected to attempt to establish the qualitative significance of Samsung activities on which he relies on by citing alleged “value-add activities” such as evaluating Samsung’s mobile products to determine features and functionalities of those products that influence consumer demand and getting feedback from Samsung teams.” Dr. Seth will explain that Mr. Herrington has not considered or evaluated whether these activities contribute anything meaningful to the DI Products, particularly as compared to Samsung’s foreign R&D and production activities. Mr. Herrington is also expected to testify that Samsung’s locations near Google and mobile network carriers allow for better collaboration in the customization of Android

[REDACTED]

OS. But as discussed above, Android is an open-source software, Samsung is not unique in collaborating with Google to customize Android, and any such customization is minor and does not affect the video coding functionality at issue here.

As with Microsoft, Mr. Herrington’s quantitative significance analysis is necessarily unreliable because he relies on vastly overstated amounts of expenditures. But again, even assuming his calculations are correct, his own analysis shows the relative insignificance of these investments in the context of other Samsung investments in the DI Products. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

X. REMEDY AND BONDING

A. Limited Exclusion Order

Nokia cannot meet its burden to show that it is entitled to an LEO or to show that its requested LEO is necessary or appropriate. Nokia requests a permanent LEO directed to “Respondents, or their parents, subsidiaries, or other affiliates,” but Nokia has identified no reason or support for directing an LEO to entities not covered under the Commission’s standard language for LEOs. Any relief in this Investigation should only directed only to products manufactured by or on behalf of Respondents that infringe any claim as to which a violation is found.

The Asserted Patents are directed to certain aspects of “video coding technologies” that, even if practiced—which Nokia has not shown—represent a fraction of the functionalities available within the accused products. The Accused Products are multi-component, multi-

functional products, whereas the Asserted Patents, at most, relate only to narrow functionalities. Nor does Nokia identify any incremental value to Nokia of the exclusion of the Accused Products.

1. Any Remedy Should be Properly Tailored

If the Commission finds a remedy is warranted, the remedy—whether an LEO or CDO—should be narrowly and expressly tailored, as explained below. *See Certain Baseband Processor Chips and Chipsets, Transmitter and Receiver (Radio) Chips, Power Control Chips, and Products Containing Same, Including Cellular Telephone Handsets*, Inv. No. 337-TA-543, Comm’n Op. at 44 (June 19, 2007) (Commission “has broad discretion in selecting the *form, scope, and extent* of the remedy”) (emphasis in original) (internal citations omitted).

Service, repair, and replacement exception. Any remedial order should include a service and repair exception, to allow Respondents to continue to service and repair products sold before the remedy’s effective date. *See Certain Mobile Devices, Associated Software, and Components Thereof*, Inv. No. 337-TA-744, Comm’n Op. at 36 (May 18, 2012).

The Accused Products include a warranty. *See, e.g.,* RX-1131, RX-1150, RX-4022-RX-4030. Respondents’ customers have an expectation based on their warranty that their product will be replaced, repaired, or serviced. Any remedy against Respondents should include a carve out for service, repair, and replacement for any warranty obligations that existed as of the date of the remedial orders to ensure no disruption to U.S. consumers or to Respondents’ obligations under their warranty. Should an exclusion order issue, a carve-out should be granted.

Certification provision. To aid Customs in its enforcement efforts and protect legitimate commerce, any LEO should also include a certification provision whereby Respondents can certify that certain of their imported products are not subject to exclusion. *See Certain Laser Bar Code Scanner & Scan Engines*, Inv. No. 337-TA-551, Comm’n Op. at 23 (June 14, 2007).

No downstream relief. Whether analyzed under the traditional nonexclusive EPROMs factors concerning downstream relief or under a common-sense balancing of the parties' conflicting interests, Nokia's requested relief is overbroad and unwarranted as to downstream products. *See Hyundai Elec. Indus. Co. v. ITC*, 899 F.2d 1204, 1209 (Fed. Cir. 1990); *Certain Erasable Programmable Read-Only Memories, Components Thereof, Prods. Containing such Memories, and Processes for Making Such Memories*, Inv. No. 337-TA-276, USITC Pub. No. 2196 (May 1989) ("EPROMs"). There is no benefit to Nokia from an exclusion order against downstream products. Nokia's requested remedy is unnecessary, will adversely impact Respondents, non-parties, customers, and have no value to Nokia apart from hold-up. The CPU and GPU chips represent a small and minor component of the downstream Accused Products, which are complex, multi-functional products. The value of Respondents' products is significantly higher than the value of the narrow, accused functionality incorporated into the CPU and/or GPU chips incorporated therein. Compared to the cost of the CPU and GPU chips, Respondents' products cost significantly more. *See Certain EPROM, EEPROM, Flash Memory, and Flash Microcontroller Semiconductor Devices and Prods. Containing Same*, Inv. No. 337-TA-395, Comm'n Op. at 82 (Dec. 11, 2000) (value of flash memory chips was "quite small" compared to the \$200 downstream computer motherboards). The exclusion of these downstream products would impose significant burden to both Respondents and third parties. The broad downstream relief sought by Nokia in this Investigation will adversely affect Respondents, their employees, and their customers. It will also impede on Respondents' ability to continue to create innovative consumer products. Accordingly, no exclusion order should be issued in this Investigation as to Respondents' downstream products.

2. Delayed Implementation



To alleviate the harm to consumers, any remedy in this Investigation should also be delayed allowing Respondents to develop and/or implement non-infringing alternatives. This would ensure that customers are able to purchase products from Respondents (their preferred vendors) and keep prices from surging, which would negatively affect customers. Additionally, for entities that have long procurement processes and are not able to easily change brands, such as educational, governmental, and enterprise entities, there should be a delay to allow these entities to be able to switch brands seamlessly.

B. Cease-and-Desist Order

Acer and ASUS have entered into a stipulation with Nokia regarding cease and desist order in the event that there is a violation in this Investigation.

C. Bond

The purpose of a bond during Presidential Review is to prevent injury to the Complainant, 19 U.S.C. § 1337(j)(3), and the complainant bears the burden of showing both the necessity for and amount of any bond. Nokia has not provided evidence that Respondents' sale of Accused Products during the presidential review period ("PRP") would affect Nokia's ability to compete. *See Magnetic Tape Cartridges*, Comm'n Op., 2019 WL 2635509 at *45 (Apr. 9, 2019) (no bond during PRP where complainant failed to show bond was warranted). Nokia fails to meet its burden of establishing that a bond is necessary during the PRP. Nokia is not entitled to a 100 percent bond. Nokia does not directly compete with Respondents and Nokia "presents no evidence of a competing product that needs protection from injury during the [PRP]." *Certain Mobile Electronic Devices, Including Wireless Communication Devices, Portable Music and Data Processing Devices, and Tablet Computers*, Inv. No. 337-TA-794, Comm'n Op. at 118- 119 (July 5, 2013). For these reasons, the bond rate should be set at zero, or no more than a reasonable royalty (*i.e.* a RAND rate).

XI. PUBLIC INTEREST AND OTHER DEFENSES

A. Statutory Public Interest

No remedy should issue because Nokia's requested remedial orders would cause significant harm to the public interest. At a minimum, delay of enforcement to mitigate harm to the public interest is required. *See Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof*, Inv. No. 337-TA-1065, ID at 189-191 (Oct. 19, 2018) (recommending no relief issue); *Certain Integrated Circuits and Prods. Containing the Same*, Inv. No. 337-TA-1148, ID at 191-192 (May 22, 2020) (recommending remedy be delayed for twelve months to mitigate harm).

1. Protection of the Public Interest Is Paramount

Before issuing any remedial order, the Commission must "consider[] the effect of such [an order] upon the public health and welfare, competition conditions in the United States economy, the production of like or directly competitive articles in the United States, and United States consumers." 19 U.S.C. §§ 1337(d)(1), (f)(1). When public interest considerations are present in an investigation, "the public health and welfare and the assurance of competitive conditions in the United States economy must be the *overriding considerations* in the administration of this statute." *Trade Reform Act of 1974*, Report of the Committee on Finance United States Senate Together with Additional Views on H.R. 10710, November 26, 1974, at 197 (emphasis added); *see also* S. Rep. 93-1298 ("The Committee feels that the public interest must be paramount in the administration of the statute."); H.R. Rep. No. 93-1644, 1974 WL 11697 at *7391 (1974).

If the Commission finds that an exclusion order would have a greater adverse impact on the public interest than would be gained by protecting the patent holder, then no remedy should be issued. *Certain Inclined-Field Acceleration Tubes and Components Thereof*, Inv. No. 337-TA-67, Comm'n Op. at 21-22 (Dec. 1980) (relief denied due to overriding public interest in continuing

[REDACTED]

basic atomic research using imported acceleration tubes which were of higher quality than domestic product); *Certain Automatic Crankpin Grinders*, Comm’n Op. at 17-21 (relief denied due to overriding public interest in fuel efficient automobiles using imported crankpin grinders where domestic industry could not meet demand); *Certain Fluidized Supporting Apparatus and Components Thereof*, Inv. No. 337-TA-182/188, Comm’n Op. at 23-25 (Oct. 1984) (relief denied due to overriding public interest in specialized hospital beds for burn patients where domestic industry could not meet demand within reasonable time and no therapeutically comparable substitute was available); *see also* USTR Disapproval Letter (Presidential disapproval of exclusion order in 337-TA-794 barring import of Apple iPhone and iPad models found to infringe a standard essential patent, citing public interest factors and finding adverse effect on competitive conditions in U.S. economy and U.S. consumers). Of paramount importance in the balancing test is whether “inadequate supply within the United States—by both the patentee and domestic licensees—mean[s] that an exclusion order would deprive the public of products necessary for some important health or welfare need.” *Spansion, Inc. v. ITC*, 629 F.3d 1331, 1359 (Fed. Cir. 2010).

When excluding the accused devices would have an adverse impact on the public interest, it is also within the Commission’s discretion to tailor a remedy to minimize that harm. *See Certain Baseband Processor Chips and Chipsets*, Comm’n Op. at 152-53 (exemption warranted for previously imported models of 3G wireless communication devices as “necessary to reduce the burdens imposed on third parties and consumers particularly in light of the limited availability of alternative devices that do not contain infringing chips or chipsets”); *Certain Mobile Devices, Associated Software, and Components Thereof*, Inv. No. 337-TA-744, Comm’n Op. at 22 (May 18, 2012) (finding public interest warrants exemption from any exclusion order for the importation of parts and components used in the maintenance, service, repair, or replacement of respondent’s

[REDACTED]

products previously sold in the U.S.); *Certain Sortation Systems, Parts Thereof, and Prods. Containing Same*, Inv. No. 337-TA-460, Notice of Violation of Section 337, 68 Fed. Reg. 5047 (Jan 31, 2003); *Certain Lithium Ion Batteries*, Inv. No. 377-TA-1159, Comm’n Op. (March 4, 2021) (issuing a limited exclusion order tailored for public interest considerations); *Certain Microfluidic Devices*, Inv. No. 377-TA-1068, Comm’n Op. (Jan. 10, 2020); *see also Certain Integrated Circuits and Prods. Containing the Same*, Inv. No. 337-TA-1148, ID at 188–89, 193–94 (May 22, 2020) (finding no violation and recommending that, if the finding of no violation were reversed, any remedy should be delayed for twelve months to mitigate the consequent harm to the public).

This Investigation presents overriding public interest considerations with no countervailing benefit to Nokia. Here, the requested relief will have adverse effects on the public health and welfare, competitive conditions, and U.S. consumers. Any marginal interest in enforcing Nokia’s patents is far outweighed by the significant harm that an exclusion order would inflict on the public interest. For at least the reasons set forth in detail below, and described in the preceding sections, the Commission should deny any relief.

2. Nokia’s Request for Exclusionary Relief on RAND-Encumbered SEPs Is Contrary to the Public Interest

This Investigation presents unusually strong public interest considerations because Nokia seeks exclusionary relief on patents it contends are SEPs subject to RAND obligations. Nokia contends that certain asserted patents have claims that are standard-essential. To the extent Respondents’ arguments relate to SEPs, they are presented in the alternative should Nokia carry its burden to prove essentiality. But if the Commission finds that any asserted patent is an SEP encumbered by RAND obligations, Nokia’s requested relief is contrary to the public interest.

Allowing Nokia to secure remedial orders on patents it asserts to be SEPs would undermine the entire scheme that permits the creation of industry standards and would hurt U.S. industry.

Government agencies²⁸ and courts²⁹ have made clear that injunctive relief based on RAND-encumbered patents undermines the public interest by reducing investment in standard-compliant products, raising prices, reducing choice, and decreasing investment into technology complementing these standards. An FTC Chair and an FTC Commissioner have urged the ITC not to issue an exclusion order in such circumstances because “[w]hen a District Court can make a complainant whole . . . even a limited exclusion order is not in the public interest.”³⁰

Nokia itself recognizes and have argued that issuing an exclusion order related to RAND-encumbered patents is “antithetical”³¹ to the RAND commitment and would “allow holders of essential patents to repudiate RAND commitments at will when it suits their purpose to utilize the leverage of an ITC action.”³² Nokia acknowledges that issuing exclusion orders in such circumstances risks “irreparably undermin[ing] the enforceability of RAND commitments,” which carries with it deleterious public interest effects including reduced investment in standard compliant products, increased consumer product costs, and reduced consumer choice.³³ An

²⁸ *Certain Mobile Elec. Devices, Including Wireless Commc’n Devices*, Inv. No. 337-TA- 794, Letter from United States Trade Representative, Ambassador Michael B. G. Froman Disapproving Commission Determination at 2-3 (Aug. 3, 2013) (“USTR Disapproval Letter”); *Certain UMTS and LTE Cellular Communication Modules and Products Containing the Same*, Inv. No. 337-TA-1240, FTC Chair Khan and Commissioner Slaughter’s Written Submission on the Public Interest (May 16, 2022) (“1240 FTC Commissioner Statement”); *Certain Wireless Commc’n Devices, Portable Music & Data Processing Devices, Computers & Components Thereof*, Inv. No. 337-TA-745, Third Party United States Federal Trade Commission’s Statement on Public Interest at 1 (June 6, 2012).

²⁹ *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1332 (Fed. Cir. 2014) (noting that “[a] patentee subject to RAND commitments may have difficulty establishing irreparable harm” to obtain an injunction); *Microsoft Corp. v. Motorola, Inc.*, 696 F.3d 872, 884 (9th Cir. 2012) (similar).

³⁰ 1240 FTC Commissioner Statement at 6.

³¹ 868 Nokia PI Statement at 2.

³² *Certain Gaming and Entertainment Consoles, Related Software, and Components Thereof*, Inv. No. 337-TA-752, Nokia Public Interest Statement at 1 (June 8, 2012) (“752 Nokia PI Statement”).

³³ 752 Nokia PI Statement at 1.

[REDACTED]

exclusion order would harm competitive conditions in the U.S. economy and U.S. consumers, and these substantial public interest harms compel denial of any exclusionary relief.

a) Nokia's Requested Relief Would Harm Competitive Conditions in the U.S. Economy

Nokia is obligated to license its SEPs on RAND terms. Allowing Nokia to obtain exclusionary relief on SEPs would undermine the framework that enables the development of industry standards and would harm U.S. industry. *See* 1240 FTC Commissioner Statement at 3 (“[B]ecause developing and implementing a standard requires significant resources, firms would be much less likely to invest in either if there were a significant risk that SEP owners would opportunistically withhold licenses to block them from commercializing standard-compliant products: *id.* at 5 (“An inappropriate exclusion order . . . harms consumers in the longer run through reduced innovation, competition, quality, and choice if firms choose to reduce investment in standardized products.”). Innovators such as Acer and ASUS rely on industry standards because they are assured that SEPs will be licensed on RAND terms. Issuing an exclusion order on RAND-encumbered SEPs would disrupt the research and development investments, and innovation leading to fewer choices for U.S. consumers. *See, e.g.,* Nokia PI Statement in Inv. No. 337-TA-868 at 3 (“[I]f FRAND is not enforced, the multiple of benefits that society has reaped from the collaboration of erstwhile competitors will be lost”).

Moreover, RAND obligations provide critical assurances to standards developers and implementers that the patents necessary to practice a standard will be available for license on fair, reasonable, and non-discriminatory terms. Adherence to these obligations is essential to the creation, adoption, and proliferation of standards that promote competition and innovation. An exclusion order here would undermine those assurances. As Drs. Simcoe and Seth will explain, Nokia's requested relief creates substantial anticompetitive risks and would harm competitive

[REDACTED]

conditions in light of the economic rationale for standardization, the purposes of SSO intellectual property policies, and the role of disclosure rules and RAND commitments, all of which are designed to enhance competition and benefit consumers.

b) Nokia's Requested Relief Would Harm U.S. Consumers

As Drs. Seth, Phiroz, and Simcoe will explain, Nokia's requested relief in this Investigation regarding RAND-encumbered SEPs would negatively impact consumer welfare, denying the advantages of greater competition and innovation associated with industry standards backed by enforceable RAND obligations. Agencies and courts recognize that standard developing organization and the licensing between SEP holders and those who seek to implement technologies subject to RAND commitments help to promote technological innovation, consumer choices, and industry competitiveness, including the emergence of technology and market entry of new entities. Disruption of this scheme by the threat of an injunctive relief of willing licenses harms innovation, consumers, and competitiveness.

In the near term, consumers face the loss of access to products and services that rely on standardized technology. Acer and ASUS individually account for approximately 7% and 5%, respectively, of the desktop and notebook computer market segments in the United States. *See, e.g.,* RX-0580; RX-0213; RX-0584. As discussed in more detail in below sections, U.S. consumers would be harmed if deprived of these popular and necessary products at the volumes implicated. In the long term, the disincentive to implement standard essential technology and diminished returns to follow-on innovation would limit the benefits of standardized technology to consumers.

3. The Detrimental Effects of the Requested Exclusionary Relief Supersedes the Benefit to Nokia, a Patent Holder with No Competing Products

a) Unavailability of Alternative Products

[REDACTED]

Irrespective of whether the Asserted Patents are SEPs, the unavailability of alternative products to fill any shortage left by exclusion of Respondents' products would negatively impact the public interest. A complainant must "identify like or directly competitive articles that complainants, its licensees, or third parties make which could replace the subject articles if they were to be excluded." 19 C.F.R. § 210.08(b). A complainant must also "[i]ndicate whether the complainants, its licensees, and/or third parties have the capacity to replace the volume of articles subject to the requested remedial orders in a commercially reasonable time." *Id.* Nokia has not, and cannot, identify any such articles or the ability to replace the Accused Products.

As an initial matter, Nokia does not make any competitive products. The few entities that Nokia has identified as replacements are not adequate. The absence of sufficient available alternatives presents harm to competitive conditions, U.S. consumers, and the public welfare should the requested relief issue. As Dr. Seth will explain, the market lacks readily available alternatives for Respondents' Accused Products. Nokia has not identified any entity that would be able to provide sufficient and adequate alternatives to replace the large volume and scope of the Accused Products.

[REDACTED]

[REDACTED]

[REDACTED] See *Certain Elec. Digital Media Devices*, Inv. No. 337-TA-796, Comm'n Op. at 120 (Sept. 16, 2013) ("Rather, the impact is assessed in the aggregate and

consideration is given to whether there are reasonable substitutes for the devices subject to the exclusion order in terms of *features, price points, and other pertinent factors.*”) (emphasis added).

The Accused Products are used extensively in the U.S. by many millions of consumers. Between [REDACTED] Acer sold approximately [REDACTED] accused products in the U.S.; and between [REDACTED] of accused products in the U.S. Dr. Seth will explain that the market for notebooks is segmented by price performance, operating systems, and end-use, such as education, everyday-use, business, and gaming, and the effect an exclusion order will have on each of these segments.³⁵

Education Segment: As Dr. Seth will explain, there are no readily available alternatives to the Accused Products in the U.S. education notebook segment. Acer and ASUS together account for a substantial share of education laptops – approximately [REDACTED]—and play a critical role within the Chromebook ecosystem, especially in the lowest and mid-price bands relied upon by K-12 schools nationwide. School districts overwhelmingly prefer Chromebooks due to ChromeOS’s ease of use, strong security, and deep integration with Google Workspace for education, which are difficult substitutes with Windows or macOS devices. Acer and ASUS are further distinguished by strong price-performance, rapid deployment capabilities, and complementary services such as training, warranty support, and repair programs, all of which are essential for schools operating under tight budgets and limited IT capacity. In addition, Respondents have several initiatives and services dedicated to improving access to technology in

³⁵ Dr. Seth will also rebut Nokia’s expert, Dr. Akemann’s analysis as deficient because his definition of the relevant markets is too broad; he overstates the flexibility of global supply chains and ability of manufacturers to expand production or reallocate capacity in the short run; and his public-welfare and consumer-impact analysis vastly understates the consequences of excluding the Accused Products.

[REDACTED]

educational settings and equipping students with real-world technology-related skills. Independent reviewers consistently rank Acer and ASUS Chromebooks as leading education devices, reinforcing their importance in this segment.

Dr. Seth will also explain that excluding the Accused Products would impose significant switching costs and operations disruptions to U.S. schools. Schools would face material obstacles in shifting to alternative Chromebook OEMs or non-Chromebook operating systems, including school-wide replacement requirements to maintain capability, staff and student retraining, multi-year rollout timelines, procurement constraints, IT staffing limitations, cybersecurity risks, and uncertainty regarding warranties and repair programs. These burdens are compounded by the imminent replacement cycle for millions of Chromebooks purchased between 2019 and 2022³⁶ and the limited ability of other OEMs to rapidly scale manufacturing to fill the resulting supply gap. Evidence will show that the remaining OEMs would need to increase production by as much as [REDACTED]—capacity they lack. Accordingly, an exclusion order would materially disrupt educational institutions and harm students and educators.

Gaming Segment: As Dr. Seth will explain, Respondents are indispensable suppliers in the U.S. gaming laptop segment. In 2024, Acer and ASUS together accounted for approximately [REDACTED] of the U.S. gaming notebook market, depending on price band.³⁷ Acer's Nitro and Predator lines dominate the entry-level and mid-ranger tiers, while ASUS's TUF and ROG product lines hold particularly strong shares in the premium segment. The market recognizes both Acer and ASUS for delivering strong price-performance across the full range of gaming laptops.

³⁶ Chromebooks typically have a [REDACTED] lifecycle.

³⁷ In 2024, Acer accounted for nearly [REDACTED] of the segment for the lowest price-band and ASUS accounted for nearly [REDACTED] of the highest price band.

[REDACTED]

Replacing the Accused Products would require other OEMs to increase manufacturing by as much as [REDACTED] in key gaming price bands—an increase that evidence shows is not feasible.

Business Segment: Dr. Seth will demonstrate that Respondents also play an important role in the U.S. business laptop segment by offering durable, secure, and enterprise-ready devices at competitive prices. Large organizations—including companies that have deployed Respondents’ laptops company-wide—would face significant costs if forced to switch devices, including retraining employees, reconfiguring IT systems, and disrupting ongoing operations. An exclusion order would therefore impose material switching costs on business and reduce competitive pressure in the business notebook market, particularly for cost-conscious organizations.

Everyday Use Segment: Dr. Seth will also demonstrate that in the everyday-use notebook segment, Respondents are especially important providers of low-cost, high-value laptops for consumers and small businesses. Respondents account for [REDACTED] of the everyday-use segment in the U.S. across different price bands. In 2024, Acer held the largest market share in the [REDACTED] while ASUS captured a substantial share of the [REDACTED] (excluding Apple), reflecting strong consumer preference for their products at both ends of the market. Excluding the Accused Products would significantly reduce affordable options for consumers, while other OEMs lack the manufacturing capacity to replace the lost supply. Evidence will show that the remaining OEMs would need to increase production by up to [REDACTED] in the lowest price band and more than [REDACTED] in the highest price band—an outcome that is economically implausible. As a result, an exclusion order would reduce consumer choice, increase prices, and harm competitive conditions in the U.S. notebook market.

Nokia simply cannot show that alternative products can fill the shortage left by the overbroad remedy that it seeks. *See Certain Automatic Crankpin Grinders*, Inv. No. 337-TA-60,

[REDACTED]

Comm’n Op. 17-21 (Dec. 1979) (“This is the first time the Commission has determined that the public interest factors preclude imposition of a remedy. The primary reason for our determination is that the domestic industry cannot supply the demand for new orders of the patented product within a commercially reasonable length of time. Neither complainant nor its domestic licensee can make delivery on a new order to a domestic customer prior to the expiration of the patent.”); *see also Spansion*, 629 F.3d at 1359. As Dr. Seth will demonstrate and the evidence will show, Respondents’ products are unique in, among other things, their volume, price accessibility, configurations, performance, durability, security, distribution channels, and their brand.

In addition, as Drs. Seth and Phiroz will demonstrate, there are supply chain bottlenecks and insufficient supply of components and potential alternative notebooks. Dr. Phiroz will explain that modern electronic products depend on complex, globally distributed supply chains involving interdependent components from multiple suppliers, making rapid production increases difficult to face of shortages, demand surges, and trade disruptions. The ability of other entities such as HP, Dell, and Lenovo to absorb excess demand would depend on available short-term capacity and long-term incentives to expand, yet there is no evidence they possess sufficient capacity to replace the excluded volumes. Moreover, other Nokia licensees such as Microsoft and Samsung hold negligible shares of the U.S. notebook market—less than 1.5% in key segments in 2024—making it economically unrealistic to expect them to serve as viable substitute for Acer and ASUS.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

b) The Requested Relief Would Harm Competitive Conditions in the U.S. Economy

Irrespective of whether the Asserted Patents are SEPs, excluding the substantial shares of Respondents' products would adversely impact competitive conditions in the U.S. economy. As discussed above, Respondents are market segment leaders in their respective fields. A remedy against their large volumes of diverse products would drastically reduce competition, along with consumer choice and domestic investments and jobs that depend upon the availability of the Accused Products. Drs. Seth and Phiroz will testify that an exclusion order would disrupt supply chains that have already been rendered fragile by shortages, and supply chain disruptions; and subvert existing and future investment, dampen production, dilute incentives for new product innovation, and negatively impact the U.S. gross domestic product. The requested remedial order would also cause significant harm to competitive conditions in the U.S. economy, as well as to the labor force of Respondents and the entities in their supply chain, consumers, and a broad array of businesses, governmental entities, and non-profits.

As Dr. Seth will demonstrate, an exclusion order would lower competition among the remaining firms in the PC market. As discussed above, Respondents are key players in the PC market, especially in the lower and mid-range price segments that serve schools, organizations, and cost-conscious consumers. Their exclusion would remove important options for U.S. consumers and lessen the constraints that currently keep leading brands competitive on price and

[REDACTED]

quality. With fewer strong rivals, the remaining firms would have weaker incentives to offer lower prices, improve performance, or introduce new products. The result would likely be higher prices, less choice, and slower innovation for U.S. consumers—outcomes that work against the public interest. Using economic models, Dr. Seth captured the welfare loss from higher prices and/or reduced choices under scenarios where remaining firms are unable to meet the unmet supply and when they can meet it. Dr. Seth will testify that under both circumstances (scarcity effect & market power effect), prices increase in the market, resulting in the welfare loss to consumers.

c) The Requested Relief Would Harm U.S. Consumers

In addition to what has been discussed above, Dr. Seth will demonstrate that the requested remedial orders would negatively impact U.S. consumers. First, the remedial orders would prevent the importation of a large breadth of leading products with important uses by customers. Second, Nokia, its domestic industry licensees, or any other participants do not have the ability to meet U.S. demand for the Accused Products. Third, U.S. market segments would be implicated leading to shortages of products that would lead to reduced competition, increased price, reduced consumer choices, and deprive U.S. consumers access to features and products available.

Dr. Seth's economic modeling will show that lower-bound consumer welfare losses approaching [REDACTED] for Respondents Products, depending on whether competitors can replace lost supply and how remaining firms exercise increased market power.

d) The Requested Relief Would Harm the Public Health and Welfare

This factor relates not just to “health” or “safety”—public welfare also encompasses adverse impacts on employment or economic growth.³⁸ Nokia threatens consumers and

³⁸ See, e.g., *Certain Microprocessors, Components Thereof, and Prods. Containing Same*, Inv. No. 337-TA-781, ID at 366-69 (Dec. 14, 2012) (considering impact on public welfare from projected



Respondents’ employees developing the Accused Products by broadly targeting products that provide significant benefits, including by allowing millions to work, access news, watch movies, learn, play video games, and communicate. Exclusion of the accused products would have an extreme, and direct, impact on U.S. investments, U.S. jobs, and U.S. innovation. The Respondents in this Investigation are prominent technology companies in the world that make significant contributions to the U.S. economy, including employing U.S. citizens. Nokia’s requested relief would harm Respondents’ continued investments in their accused product lines. An exclusion order will have no impact on innovation by Nokia because Nokia does not perform R&D relating to the technology at issue in this Investigation, and it will have a substantial impact on innovation by Respondents and the rest of the industry if the Accused Products are banned from import. Incentives matter when it comes to innovation: companies will stop or significantly curtail investments in R&D for the incorporated technology in the face of a threat of total exclusion.

The sweeping exclusion order Complainant seeks would also adversely impact Respondents’ ability to continue contributing to the U.S. economy in the form of domestic investments. An exclusion order so broad would have a profound impact on many sectors of the U.S. economy, including education. Nokia’s requested relief rests on “[v]ideo coding technologies” within one feature in Respondents’ products containing thousands of complex components and features wholly unrelated to the asserted patents. While there are many products that provide for video playback, the market segment for personal computers is much narrower, with only a few players. In other words, Acer’s and ASUS’s desktops and notebooks cannot simply be replaced by any video playback device. There is also a public interest mitigating against an

job losses, decreased U.S. manufacturing, and adverse macroeconomic effects).

[REDACTED]

exclusion order that bars the importation or sale after importation of product components with no relationship to the technology covered by the SEPs.

As discussed above, Respondents sell their Accused Products to channels that would impact governmental, military, educational, and business sites. For example, Acer and ASUS Accused Products are extensively used by educational institutions and students; large enterprises; and small businesses in the U.S. As discussed above, there are no likely readily available alternatives to replace the Accused Products in the education market. For the education segment, Dr. Seth will testify that an exclusion order would result in shortages of Chromebooks and would force schools to (1) transition to other OEM notebooks at higher prices and incur significant switching costs and/or (2) delay investing in notebooks for their institutions. This would be particularly detrimental to public K-12 schools which have limited funds and resources. The resulting instability would impede the continuity of teaching and learning, slow the integration of educational technology, and intensify existing inequalities in access to essential digital resources. Respondents also offer laptops designed to meet military durability standards, making them relevant to defense and public sector-use, the exclusion of which will adversely affect military sites with reduced choices.

Dr. Seth will testify that an exclusion order covering the Accused Products would disrupt U.S. business operations and productivity by removing devices that are deeply integrated into the systems of major organizations and small businesses alike. Large enterprises that deploy Acer and ASUS products organization-wide would face compatibility problems, forced vendor transitions, and costly software and infrastructure adjustments, while small resource-constrained businesses—who rely on these products’ price-to-performance advances—would be pushed toward more expensive alternatives, threatening profitability and continuity. Because Acer and ASUS also



provide essential complimentary services such as maintenance, upgrades, and training, their removal would further destabilize existing IT ecosystems. These operational disruptions would not remain confined to businesses; they would ripple outward to millions of U.S. consumers who depend on downstream services, including transportation, logistics, and digital platforms, harming the public interest.

As Drs. Seth and Phiroz will demonstrate and the evidence will show, an exclusion order precluding Respondents' Accused Products will harm consumers in these channels as well as Respondents' employees involved in the R&D and innovation of Respondents' products and those involved in Respondents' supply chains. Dr. Seth will also testify that an exclusion order in this Investigation would not spur domestic production, but instead risk delays and shortages, which translate to disruption and loss of consumer welfare and spillover effects. An exclusion order would reverberate across the highly specialized and interdependent consumer electronics supply chain, harming numerous U.S. third parties whose revenues depend on the Accused Products. These devices incorporate hundreds of components from concentrated suppliers who cannot easily redirect production, meaning even short-run demand shocks can impose significant cost. U.S. companies providing components, software, communication platforms, operating systems, accessories, distribution, and retail services will face reduced sales and weakened customer relationships. Because the ecosystem relies on complementary goods and tightly integrated services, disruptions would extend beyond hardware manufacturers to software platforms, education technology, retailers and accessory markets. An exclusion order would cascade through the broader ecosystem, imposing upstream and downstream harms that undermine investment, employment, and innovation.

[REDACTED]

Dr. Seth will testify that an exclusion order impacting the accused products will further exacerbate the impact of prices of PCs from recent tariffs imposed in the U.S. The Consumer Technology Association has estimated that tariffs could cause prices of laptops and tablets to rise by 34%. This dynamic makes it more likely for U.S. consumers to look further down-market than they normally would when purchasing a PC and accordingly make them more likely to purchase low-cost options like Respondents provide where they normally may not have.

e) The Requested Relief Would Provide No Benefit to Nokia or to the Public Interest

As the Federal Circuit and the Commission have recognized, it is not always in the public interest to enforce intellectual property rights through an ITC exclusion order. *See Rosemount, Inc. v. ITC*, 910 F.2d 819, 822 (Fed. Cir. 1990) (“We also agree with the Commission’s rejection of the view that the public interest inevitably lies on the side of the patent owner because of the public interest in protecting patent rights, . . . other public interest factors are delineated in the above-quoted section 1337(e)(1) and must be taken into account.”). Here, protecting the patent owner’s rights through an exclusion order—to the extent the Asserted Patents are valid and infringed—would harm the public interest on multiple fronts. The harm from an exclusion order under every public interest factor, discussed above, is undeniable in this Investigation and outweighs any generalized interest in enforcing patent holder rights in this forum. In contrast, there is nothing to be gained by protecting Nokia. *See Certain Inclined-Field Acceleration Tubes*, Inv. No. 337-TA-67, Comm’n Op. at 11 (Dec. 1980).

The requested remedy would provide no cognizable benefit to Nokia. The Commission, the FTC, and others have drawn a sharp distinction between (1) revenue-driven—or ex post—licensing in which NPEs such as Nokia are engaged and (2) production-driven—or ex ante—licensing. While ex ante licensing, intended to transfer and proliferate technology, encourages

[REDACTED]

innovation and benefits consumers, ex post licensing deters innovation and harms consumers.³⁹; *see also Certain Multimedia Display & Navigation Devices*, Comm’n Op. at 25 (describing “at least two types of ‘licensing’ activities...production-driven licensing which encourages adoption and use of the patented technology to create new products and/or industries and revenue-driven licensing which takes advantage of the patent right solely to derive revenue by targeting existing production”). Nokia is merely using the ITC, which is intended to protect American industry and consumers, to threaten successful consumer product companies into accepting supra-RAND licensing terms, believing that those companies cannot afford to risk losing the U.S. market segment.

Nokia’s statements of a generalized benefit from the importance of IP enforcement fall flat. Nokia’s relationship with its licensees is not related to any production-driven activities as it did not begin to license the Asserted Patents until after it ceased its own production activities—which were not even in the United States—in 2014.

The only arguable benefit to Nokia from an exclusion order would be the unreasonably high royalties it would seek to extract as an effect of patent hold-up. But, as discussed above, patent hold-up comes at a significant cost to the public interest. Moreover, any argument from Nokia that it would benefit from additional royalties as a result of an exclusion order merely underscores the illegitimate purpose with which it brought this Investigation. Nokia seeks to extract an unwarranted license fee from Respondents by using the ITC’s injunctive remedy to seek relief it is not entitled to, and one which it could not obtain in, e.g., district court. *See, e.g., eBay Inc. v. MercExchange, L.L.C.*, 547 U.S. 388, 391 (2006). Indeed, there is no concern regarding whether

³⁹ *Evolving IP Marketplace* at 50.

[REDACTED]

Respondents can pay damages or a RAND determination. There is, therefore, no cognizable benefit to Nokia from an exclusion order.

4. The Public Interest Concerns Warrant No Remedy or Tailored Remedy

For the reasons set forth above, the requested remedies against the accused products would significantly harm the public interest. In contrast, the requested remedies would provide no benefit to Nokia. As such, no remedy should issue. *See Certain Inclined-Field Acceleration Tubes*, Comm’n Op. at 11. At a minimum, relief must be tailored to the realities of this Investigation, for example, permitting warranty and repair, and delaying implementation of any remedial orders for a period of time sufficient to allow Respondents and their customers time to begin making changes to their products and supply chains to alleviate harm to the public interest. *See Certain Integrated Circuits and Prods. Containing the Same*, ID at 188–89, 193–94 (finding no violation and recommending that, if the finding of no violation were reversed, any remedy should be delayed for twelve months to mitigate the consequent harm to the public).

Additionally, no remedy should issue in this Investigation because Respondents have agreed to take a license in the UK. As noted in Respondents’ Notice of Supplemental Authority, the UK court has issued an interim license. (EDIS Doc. ID 868453).

B. RAND/SEP-Related Defenses

Respondents assert the following additional defenses to Nokia’s patent infringement claims and its request for exclusionary relief:⁴⁰ (1) breach of RAND obligations; (2) breach of the duty to negotiate in good faith; (3) equitable estoppel, patent misuse, waiver, and implied waiver based on standard-setting conduct; (4) express license, implied license and exhaustion; and (5) breach of

⁴⁰ Each Respondent individually asserted affirmative defenses in their respective Responses to the Complaint. All asserted defenses are combined for convenience.

[REDACTED]

contract and promissory estoppel. It is undisputed that Nokia agreed to license its patents declared essential to the Asserted Standards on RAND conditions. As courts recognize these agreements are binding, Nokia must be held to those RAND commitments. Based on these defenses, Respondents contend Nokia is not entitled to exclusionary relief from the ITC and/or the Asserted Patents are unenforceable.

As early as initial development of the Asserted Standards, Nokia consistently took advantage of SSO policy guardrails meant to preserve transparency and fairness among standards development and implementation. Nokia was required to use “best efforts” to identify its patents related to development of the Asserted Standards by the ITU’s patent policy and JVT’s Terms of Reference. *Qualcomm Inc. v. Broadcom Corp.*, 548 F.3d 1004, 1013-15 (Fed. Cir. 2008) (holding that JVT IPR policies incorporate a best-efforts standard (apart from technical proposals) and finding that JVT participants had to disclose patents before standard approval). Rather than employing best efforts, Nokia continually identified patent applications untimely—always *after* the Asserted Standards’ respective lock-in time—well past a threshold of inadvertence or neglect. As a result, Nokia was allowed to evade scrutiny of its patents, preventing the ITU and JVT the ability to assess (1) whether the Asserted Patents should be included in the Asserted Standards; and if so, (2) whether the ITU/JVT could design around the Asserted Patents.

Once armed with its portfolio of “essential” patents, Nokia embarked on a coercive campaign to extract supra-FRAND royalties from small and vulnerable licensees to build the illusion of an “accepted market rate.” But these Nokia “program rates” reflect *ex-post* value of the Asserted Patents developed by pressuring potential licensees to accede to Nokia’s demands. Nokia should not be allowed to continue this inherently non-RAND pattern.

[REDACTED]

Respondents' conduct repeatedly affirms that they are willing to accept a license to Nokia's portfolio on RAND terms. Each Respondent willingly participated in the negotiation discussions and, in fact, have come to agreement with Nokia on most material terms. The parties' primary disagreement centers around what constitutes a RAND royalty rate. Nokia refused to offer any rate other than its "program rates" but refused to provide Respondents with critical information necessary to assess whether Nokia's rate offers (*i.e.*, its "program rates") were RAND (*e.g.*, details of its purportedly "comparable" licenses). In the absence of this critical information, Respondents formulated rate counteroffers based on established methods previously endorsed by the courts *and by Nokia*. Respondents proposed counteroffers formulated using comparable licenses to H.264 and H.265 patent pool portfolios into which each Respondent had entered.

Still unable to reach agreement, Respondents each initiated a rate-setting action in the United Kingdom in which both Respondents have agreed to be bound both by interim license terms declared by the UK Court (including paying the adjustable rate set by the UK Court) *and* final RAND terms adjudicated by the UK Court. [REDACTED]

[REDACTED]. [REDACTED]

[REDACTED]

[REDACTED]. Both Respondents have offered to make a prepayment payment towards the final adjudicated license agreement to Nokia, which demonstrates that Respondents are willing licensees and protects Nokia's interests in its portfolios. R-APPX at 47-50. Pursuant to that agreement, [REDACTED]

[REDACTED] As described in this section, because Nokia is in

[REDACTED]

breach of its ITU commitment, the Asserted Patents are unenforceable as to the Asserted Standards.

1. Nokia Breached RAND Obligations

Nokia has breached its obligations to the ITU by failing to provide Respondents a license to its alleged H.264 and H.265 portfolios on RAND terms and conditions. To encourage adoption of a given standard, SSOs, including the ITU, promulgate intellectual property policies that require SSO participants to disclose patents potentially essential to implement a standard. RX-2071, RX-2076. Courts recognize that a commitment between a SEP holder and a SSO (*e.g.*, the ITU) to license SEPs on RAND terms is binding on the SEP holder under contract law and under the equitable doctrine of promissory estoppel. *See, e.g., Microsoft Corp. v. Motorola, Inc.*, 854 F. Supp. 2d 993, 999, 1002 (W.D. Wash. Feb. 27, 2012) (“The court agrees with Microsoft that through Motorola’s letters to both the IEEE and ITU, Motorola has entered into binding contractual commitments to license its essential patents on RAND terms.”); *Apple, Inc. v. Motorola Mobility, Inc.*, No. 11-cv-178, 2011 WL 7324582 at *15 (W.D. Wis. June 7, 2011) (holding that Apple had stated a claim for promissory estoppel based on Motorola’s “promises to the standards setting organization through its commitments that it would license any essential patents under fair, reasonable and non-discriminatory terms.”).⁴¹

⁴¹ Promissory estoppel occurs when a promisor makes “[a] promise which the promisor should reasonably expect to induce action or forbearance on the part of a promisee or a third person and which does induce such action or forbearance” and “if injustice can be avoided only by enforcement of the promise.” Restatement (2d) Contracts § 90; *see also* Apple, 2011 WL 7324582, at *15 (“To survive a motion to dismiss on a promissory estoppel claim, Apple must plead that Motorola made a promise that it should have reasonably to cause Apple to change its position, and that the promise caused Apple to change position in such a manner that injustice can be avoided only by enforcing the promise.”).

Here, Nokia reasonably expected its commitments to the ITU to induce Respondents to adopt H.264 and H.265 related technology in their products. Further, the RAND framework of the ITU,

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Entities, such as Respondents, who sell products supporting standardized technology are third-party beneficiaries entitled to enforce SEP holders' RAND obligations to an SSO to license its SEPs to third-party beneficiaries. This is specifically so with respect to the ITU and the H.264 and H.265 Standards. *See Microsoft*, 854 F. Supp. 2d at 999; *Microsoft Corp. v. Motorola, Inc.*, 696 F.3d 872 (9th Cir. 2012) (affirming Microsoft was a third-party beneficiary to Motorola's contractual obligations to the ITU and IEEE). Accordingly, Respondents are entitled to enforce Nokia's RAND obligations under contract law. Nokia does not deny Respondents are third-party beneficiaries entitled to enforce its RAND obligations.

Nokia's irrevocable and binding commitment to license its SEPs on RAND terms renders its choice to leverage the exclusionary power of this tribunal a coercive attempt to obtain supra-RAND rates. On the other hand, Respondents are, and have been, willing licensors who have negotiated in good faith with Nokia. This willingness can be no more clearly demonstrated than by (1) Respondents' seeking an adjudicated RAND rate from a judicial tribunal; (2) submitting to

including Nokia's commitments to the ITU, did induce Respondents to market and sell products allegedly complying with the H.264 and H.265 standards. Injustice can only be avoided by enforcing Nokia's commitments to the ITU. Therefore, these commitments are binding on Nokia as a matter of promissory estoppel.

[REDACTED]

that jurisdiction unequivocal commitments to be bound by its interim *and* finally adjudicated terms; and (2) offering, and in Acer’s case, paying to Nokia a “non-refundable and unconditional prepayment” for “the final license and release fee that will be payable under a final written F/RAND license agreement.” Therefore, the ALJ should deny Nokia’s request for an exclusion order.

a) Nokia’s Licensing Declarations to the ITU Create Enforceable RAND Obligations

It is well-settled that declaration statements committing to RAND obligations create an enforceable contract between Nokia and the ITU-T. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Because the ITU-T commitment covers the process *and* end result of a license, simply negotiating is not RAND. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

⁴² The final rate setting trial in the UK Court will be held in late June into early July 2026.

[REDACTED]

The interim license with Nokia provides protections to Nokia’s economic interests. Because Respondents have committed to the UK court that they will pay the interim license rate if offered by Nokia, the interim license with Nokia serves as a security until the final rate can be set during the rate-setting trial set to commence in late June. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Seeking to be untethered to an adjudicated rate by any legal tribunal,⁴³ Nokia has indicated that it will not offer Respondents the interim license nor the final license promulgated by the UK court. To protect the remedy sought, Respondents have moved the UK court for specific performance, which would order Nokia to offer the final license to Respondents. The UK court is poised to decide as early as January 30, 2026, whether Swiss law, which governs the contract between Nokia and the ITU, allows the UK court to order specific performance. Should the UK court determine that specific performance is allowable under Swiss law, Respondents expect that Nokia will continue to refuse to offer the license.

⁴³ Nokia has argued in the UK court that no judicial tribunal has the jurisdictional authority to determine FRAND rates. The UK court has rejected that argument.



The ITU-T, ISO/IEC, JVT, and JCT-VC each promulgated similar disclosure policies requiring essential patent disclosure.⁴⁴ To ensure that the Asserted Standards adoption and implementation is not hindered by patent rights, these SSOs seek commitments from essential patent owners to license their essential patents on FRAND terms. RX-2071, RX-2076. In line with the ITU Common Patent Policy, an unwilling licensor's technology is excluded from consideration to be incorporated in a Standard.

As early as the development of the H.264 Standard, the ITU patent policy in effect during that time required any party participating in ITU standards development to submit a "Patent Statement and Licensing Declaration" form ("Licensing Declaration Form") for patents or patent applications the party held and believed potentially covered an ITU standard. *See* RX-2071. The Licensing Declaration Form required choosing between one of three licensing options: the party was (1) willing to grant licenses "free of charge" subject to reciprocity; (2) willing to grant licenses "on reasonable terms and conditions"; or (3) unwilling to grant licenses under either option (1) or (2). RX-2071 at Appx. 1, p. 7. The ITU-T/ITU-R/ISO/IEC Common Patent Policy retains this same concept in declaration forms. RX-2076.

Nokia signed onto these RAND commitments by filing a series of Licensing Declaration Forms for the Asserted Patents directed to the Asserted Standards, committing to provide licenses "to an unrestricted number of applicants on a worldwide, non-discriminatory basis and on reasonable terms and conditions to make, use and sell implementations of the above [H.26X standard]." RX-2724; H.265-12. Notably, Nokia did not submit these declarations for the Asserted Standards (as applicable) until *after* each Asserted Standard was locked-in (May 30, 2003 for

⁴⁴ *See* Section XI.B.3, *infra*.

[REDACTED]

H.264 and April 13, 2013 for H.265). By electing to license essential patents on RAND terms, Nokia ensured that its patents would not be automatically discounted from inclusion in the Asserted Standards. [REDACTED]

[REDACTED]

[REDACTED]

b) Nokia Breached Its RAND Obligations by Failing to Provide RAND Terms and Conditions

Despite Nokia's enforceable agreement to offer RAND terms to the Asserted Patents, it has failed to do so. [REDACTED]

[REDACTED]. [REDACTED]

[REDACTED]

Respondents' rate-setting action in the United Kingdom bolsters the conclusion that Nokia's ITU commitments are enforceable contracts. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Nokia's contention that it has offered to arbitrate RAND licenses with Respondents also is of no moment because an offer of arbitration does not satisfy its RAND commitments. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Instead of adhering to RAND principles, Nokia has chosen coercion and obfuscation. Nokia's licensing practices begin with its unjustifiably high "program rates." [REDACTED]

[REDACTED]

[REDACTED] Nor has Nokia provided economic or technical evidence to support that its portfolio is more valuable than those of established patent pools.

[REDACTED]

i. Nokia's "Program Rates" Are Not RAND

Nokia's offers to Respondents originate from Nokia's licensing "program rates." Nokia's licensing program was curated to develop artificially inflated program rates. As Dr. Lopez will

[REDACTED]

explain, licensing programs are frequently made with an eye towards future litigation. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Companies negotiating with Nokia are frequently “left in the dark” with regards to Nokia’s other licensees. For example, during negotiations with Respondents, Nokia never provided information sufficient to identify the identity of the licensees, specific terms of the licenses, whether the licenses arose as a result of litigation, etc. [REDACTED]

[REDACTED]

[REDACTED]

Nokia’s previous licenses do not demonstrate the technological value of any of Nokia’s H.264 or H.265 SEPs, let alone the four asserted here. To assess the technological value of Nokia’s H.264 and H.265 portfolios, Dr. Acton compared Nokia’s patents to different patent pool portfolios, focusing on overall coverage of Nokia’s patents versus each Asserted Standard, whether Nokia’s portfolios covered the technologically critical subsections of the Asserted Standards, followed by analyzing individual patents in the patent pools for the same technologically critical subsections. R-APPX at 38.

With regards to Dr. Acton’s H.264 analysis, Dr. Acton noted that both Nokia and MPEG LA’s H.264 patent pool have similar coverage and breadth of the H.264 standard, but MPEG LA’s pool patents have significant coverage where Nokia does not. R-APPX at 38. Dr. Acton will testify

[REDACTED]

to the key features of H.264, showing that MPEG LA’s patent pool holds more technologically significant patents than Nokia’s portfolio. Rebuttal Report of S. Acton, section IV(A).

Dr. Acton came to a similar conclusion in his analysis of H.265 patent pools (MPEG LA and Access Advance) compared to Nokia’s H.265 portfolio. Rebuttal Report of S. Acton, section IV(B). Both pools, individually, contain significantly more patents than Nokia’s H.265 portfolio. R-APPX at 38. With respect to significant subsections of the H.265 standard, the pools cover significantly more subsections than Nokia’s H.265 portfolio. R-APPX at 38.

Dr. Akemann, Nokia’s RAND expert, contends that assessing Nokia’s portfolio outside of its previous licenses have “no or little value.” But as Dr. Lopez will testify, this reliance on “comparable” licenses without other evidence of the ex-ante incremental value of the patents is simply circular at best. [REDACTED]

[REDACTED]

[REDACTED]

Dr. Lopez will testify that as Nokia’s business model evolved from major smartphone implementer to NPE, its licensing program similarly changed to exhibit several key indicators of a strategic licensing program designed to extract supra-FRAND royalties from implementers. During the H.264 development and adoption period, while a major implementer, Nokia participated in MPEG LA’s initial formation meetings. *See* RX-2704.208. These formation meetings brought together major industry participants to encourage H.264 adoption by placing reasonable starting terms for SEP royalties. [REDACTED]

[REDACTED]

To secure adoption of the standard in view of this technological competition, Nokia not only supported a *royalty-free* baseline profile for H.264, but Nokia argued a codec-license for *all* H.264

[REDACTED]

essential patents should be no more than \$0.50 per unit, with an annual cap on royalties of \$8 million dollars. *See* RX-2704.217. Nokia supported low baseline royalties and an ultimate royalty cap—in other words, Nokia directly placed an *ex-ante* value on H.264 technology. RX-2704.208. The ultimate dominance of H.264 was in large part due to MPEG LA’s competitive benchmark pricing, necessary to incentivize implementers to choose H.264 over other video compression standards. Nokia necessarily relied on these competitive rates to drive adoption of H.264, which, in turn, provided a pathway for Nokia to earn licensing revenue.

As to lack of *ex-ante* apportionment, Nokia cooperated to set the terms of the MPEG LA licensing pool in 2003, when it was both an SEP licensor and licensee for its phone business. *See, e.g.,* RX-1009 (SEP holders “who have cooperated in the above [MPEG LA] terms include ... Nokia”). The turning point for Nokia’s licensing program occurred upon finalization of its handset business sale to Microsoft in April 2014. RX-1054. Once Nokia no longer competed for handset device market share, cross-licensing SEPs became a lucrative path for revenue. RX-1671.4. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Dr. Lopez’s analysis of Nokia’s Asserted Standards licenses reveals Nokia’s strategy in developing a strategic licensing program through its “minnows” and licensees that pay little royalties under Nokia’s program rates. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. Nokia learned an important lesson through these small licensees—coercion via litigation threats works.

More broadly, Nokia existing licenses do not provide any comparability or market acceptance rate evidence. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

As Dr. Lopez will explain, he has tested Nokia's rates offered to Respondents against other objective, economic benchmarks, which were established at close to the time the relevant standards were adopted: the rates for patent pools containing the overwhelming majority of the SEPs covering the H.264 and H.265 standards. With regards to H.264, MPEG LA's H.264 pool rates, which Nokia originally cooperated to set, are between \$0.10 and \$0.20 per unit, and cover upwards of 91% of SEPs to the H.264 standard. RX-0885, RX-2730. MPEG LA's AVC pool has forty-three licensors and more than 1,600 licensees. RX-1626. H.265 patent pools contain approximately 87% of H.265 patents, largely held in Access Advance's and MPEG LA's H.265 pools, containing 77% and 10% of the H.265 patents respectively. RX-0918. When apportioned to the H.264/5 pools,

[REDACTED]

Nokia holds significantly fewer patents.⁴⁵ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

While Nokia contends pool rates are not useful indicators of the value of its patents, Nokia itself participates in patent pools and states on its website that in the absence of information about SEP holders' licenses, pool rates are "publicly available market data" to which a potential licensee can look concerning "whether a license offer is FRAND." RX-0143. As further demonstrated below, pool rates are reliable indicators of the value of H.264 and H.265 SEPs.

Taken together, Nokia's offered rates are inconsistent with well-established and reliable RAND benchmarks, even when examined conservatively in favor of Nokia (*e.g.*, comparing the patent pool rates based on patent families rather than individual patent counts).

ii. Nokia's "Program Rates" Capture Ex-Post Hold-Up Value, Rather Than a RAND Royalty Ex-Ante Rate

Inherent in a standard *essential* patent is that the patented technology is a requirement for implementing the standard's technology. RX-2076. Standardization brings a captive audience of licensees to SEP owners through exclusion of alternate technologies. RX-0215. The process of standard setting fundamentally alters a reasonable royalty assessment because, when a standard is set, manufacturers invest in designing products compatible with the standard and become "locked-in" to the SSO-chosen technologies included in the standard. Once the standard lock-in has occurred, the bargaining strength of SEP owners dramatically rises.

⁴⁵ As of January 1, 2025. RX-2319C.

[REDACTED]

If SEP licensing negotiations occur before lock-in, the royalty is more likely to reflect the *ex-ante* incremental value of the claimed technologies. While future SEP owners are still competing with alternative technologies before lock-in, this competition places an upper bound at the price of the incremental value that the SEP contributes to the standard. On the other hand, *ex-post* negotiations, *i.e.*, after a standard has been developed and implementers have invested in developing products around the standard, provide opportunity for SEP owners to charge rates higher than when they were competing with the alternate technologies. RX-1353. This increase in bargaining power, if left unchecked, can lead to holdup. The legal and economic consensus is royalties on SEPs should not include what is known as *ex-post* value (which may include hold-up) and instead should be based on the *ex-ante* incremental value of the claimed technologies at the time the relevant standard was set. *See, e.g., Ericsson, Inc. v. D-Link Systems, Inc.*, 773 F.3d 1201, 1232-33 (Fed. Cir. 2014).

Patent holdup damage increases when SEP owners threaten exclusionary relief. The pressure exerted by the threat of exclusionary relief forces implementers to either accede to a higher royalty rate or run the risk of exclusionary relief being levied on it plus the cost of litigation. As Dr. Simcoe will testify, SSOs were aware of this holdup risk, and, in multiple tribunals, SEP owners were awarded royalties totaling only a fraction of the original demand for relief after being found unwilling licensors. *See* RX-1269 (finding that InterDigital acted as an unwilling licensor).

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED].

Nokia's own reliance on the so-called comparable licenses is inconsistent at best. As noted above, the rates paid by licensees often vary based on end product pricing, sales volume, lump sum discounts, past sales releases, and in a few cases, simply a lower offered rate. It is unclear that the variation in licensing is reflected in any of Nokia's offers to Respondents. These variations cannot support Nokia's assertions of a program rate.

[REDACTED]

[REDACTED]

[REDACTED] At a minimum, unpacking lump sum licenses requires sales projections and an evaluation of the other licensing terms for their value. For those lump sum licenses that can reliably be unpacked, the ultimate rate paid sometimes represents an effective per-unit rate below Nokia's program rates. As discussed above, an example of changing effective per-unit rates arises when Nokia releases certain past sales but includes a forward-going sales royalty. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

As described above, prospective licensees cannot properly analyze the “comparable” licenses provided by Nokia without express identification of license terms. In addition, this prevents prospective licensees from protecting themselves against potentially discriminatory rates. As Dr. Lopez will testify, in the context of RAND, “non-discriminatory” requires that an SEP owner must offer similar terms to similarly situated parties—and not that the licensees must all pay the same royalty rate. When SEP owners have increased bargaining power available to leverage because a standard is already locked-in, SEP owners can charge supra-FRAND rates. Royalty rates that derive from this increased bargaining power cannot be FRAND. This negates the ability to claim that a royalty rate derived from the increased bargaining power is market accepted.

The ITU-T’s patent policy requires a level playing field, treating similarly situated licensees in a similar manner. As discussed here, many different variables can adjust the effective royalty rate, including increased injunction risks, existence of broad releases for past sales, and varying combinations of licensed standards. These extra influences on royalty rates constitute hold-up—rates that necessarily are *ex post*.



iii. Patent Pool Rates Are Viable Indicators of the Value of Nokia's Patents

As discussed above, Nokia's licenses and negotiations are rife with uncertainty, especially where Nokia obscures the relevant licensing terms. Therefore, publicly available data related to SEP licensing for that standard represents some of the strongest evidence that Nokia's potential licensees have access to, often taking the form of patent pool evidence. With respect to the Asserted Standards, the dominant H.264 patent pool is managed by MPEG LA, and the patent pools for H.265 include three pools, including pools managed by MPEG LA, Access Advance, and Velos Media.⁴⁶ RX-1225 (MPEG LA / Via LA), RX-1340 (Velos Media), and RX-1436 (Access Advance). Courts have established that patent pool rates can be reliable indicators of a RAND royalty for SEPs, including for the H.264 standard. In *Microsoft v. Motorola*, the court relied on known pool rates, *e.g.*, the MPEG LA H.264 patent pool, to determine that the royalty rate demanded by Motorola breached Motorola's RAND obligations to the ITU. 2013 WL 2111217, at *82 (W.D. Wash Apr. 25, 2013) ("Despite the concerns with using a pool rate as the de facto RAND royalty rate, the court concludes that under certain circumstances, patent pools can serve as indicators of a royalty rate that falls within the range of royalties consistent with the RAND commitment. Here, the question is whether the MPEG LA H.264 patent pool is an indicator of a RAND royalty rate. The court finds that it is.").

The MPEG LA (H.264) pool, MPEG LA (H.265) pool, and Access Advance (H.265) pools are highly relevant benchmarks for the value of Nokia's H.264 and H.265 SEP portfolios. Notably, as late as 2023, Nokia advocated for using patent pools for evaluating and making offers for SEPs. RX-0143. As noted above, both MPEG LA and the Access Advance pools contain the vast

⁴⁶ Velos Media ceased operations in late 2022 and never made its rates public.

[REDACTED]

majority of H.264 and H.265 SEPs, and at least the MPEG LA and Access Advance pool rates were set at a time when the standards were not yet widely adopted and faced competition from alternative codecs.

Dr. Akemann, Nokia's economic expert, argues against reliance on pool rates, arguing that Nokia's "comparable" licenses are available for assessing value. He also makes numerous complaints, each coming back to similar points that patent pools are incentivized to keep rates low. Dr. Lopez will demonstrate that each of Dr. Akemann's arguments is unavailing.

Dr. Lopez calculated proportional rates for Nokia's Asserted Standards portfolios based on pool rates. For each of the Asserted Standards, Dr. Lopez calculated effective rates for each Respondent under the aforementioned patent pools based on the actual values each Respondent would have paid since becoming a licensee to that pool. MPEG LA's H.264 royalty structure includes no royalty for the first 100,000 units produced annually, a \$0.20/unit for 100,001-5,000,000 units produced, and a \$0.10/unit royalty for all units over 5,000,000 per year, and a royalty cap at \$9,750,000 per year for a licensee. RX-0885. MPEG LA's H.265 royalty structure includes no royalty for the first 100,000 units produced annually, a \$0.20/unit for all units produced over 100,000, and a royalty cap at \$25,000,000 per year for a licensee. RX-0922. The effective MPEG LA H.264 rates are included as Table 1 in Dr. Lopez's opening report. R-APPX at 36. Calculated the same as the H.264 MPEG LA effective per-unit rate, the MPEG LA H.265 effective per-unit rate paid is included in Table 3. R-APPX at 36.

Access Advance's pool rates have more variability based on product type and region. RX-1264. Based on Respondents' product sales, Dr. Lopez determined that Access Advance's royalties would include \$0.20/unit (Region 2) or \$0.40 (Region 1) for laptops, tablets, and smartphones,

[REDACTED]

\$0.40/unit (Region 2) or \$0.80/unit (Region 1) for desktop PCs and non-4K TVs over \$80 MSRP.

Id. Access Advance caps yearly royalties at \$40,000,000 per licensee. *Id.*

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Calculating a proportional rate for Nokia based on pool data may be done either by reference to either U.S. patent families or by total US patents. To translate the per-unit effective rate paid by Respondents to patent pools to an apportioned rate based on Nokia's patent family scales the amount of patent families for a standard as a proportional size of the pool. Appendix R-APPX at 36. Dr. Lopez then repeated this calculation for an apportioned rate based on the total number of unexpired U.S. patents. R-APPX at 37. Because H.264/5 SEPs are expiring, the calculated rates can be scaled over time based on the U.S. patent families. R-APPX at 38.

Patent pool royalty rates for the Asserted Standards include publicly disclosed information endorsed by Courts for their balanced approach to royalty rates (*e.g.*, rates high enough to incentivize SEP owners to contribute to a pool but not so high as to disincentivize implementers. *Microsoft*, 2012 WL 4827743), generally include rates close to an *ex-ante* benchmark, and include sweeping portions of the Asserted Standards. Therefore, patent pools are useful indicators of pricing for the Asserted Standards.



2. Nokia Breached Its Duty to Negotiate in Good Faith with Respondents

The negotiations between Nokia and Respondents are most significantly centered around whether the rates that Respondents should pay to Nokia are RAND. Negotiations over royalty rates are fundamental in any licensing discussion. Where Nokia's negotiations with Respondents differ from the norm is that the negotiations are underpinned by Nokia's refusal to justify its program rates, refusal to provide a full picture of existing licenses for Respondents to examine comparability, and, most notably, when Nokia filed suit and requested the instant Investigation against Respondents. These factors, among others, show the asymmetric bargaining positions between Respondents and Nokia, namely in asymmetry in available information.

To ensure fair terms, each Respondent agreed to a binding rate-setting proceeding in the United Kingdom—a true third-party neutral that can determine both a RAND royalty rate and the licensing terms that the parties would be subject to. RAND royalties are, by definition, sufficient for Nokia to be made whole and to compensate Nokia for the use of its portfolio.

Despite the declaration of interim license by the UK court, which, as discussed below, fully protects Nokia's economic interests, Nokia exhibits behavior of an unwilling licensor engaging in patent hold-up. Nokia has not offered (and has represented that it will not offer) the interim license terms adjudicated by the UK court. Nokia's refusal is unreasonable—both an interim and final license to Nokia's portfolio would, in effect, resolve the dispute between the parties. Respondents have consistently expressed that each would agree to be bound by the interim and final (F)RAND determination in the UK. By refusing to (1) offer the interim license as declared by the UK court, a court of competent jurisdiction, and (2) be bound by its decision, Nokia can only be said to be engaging in “holdup”—using this tribunal's exclusionary power to leverage supra-RAND rates.

The negotiations between Nokia and individual Respondents followed similar cadences, with each party exchanging offers, with Nokia's offers generally based on program rates and the

As previously discussed, Nokia repeatedly asserts that its program rates are supported by a market acceptance theory supported by scores of “comparable” licenses. However, during the negotiations, no Respondent had nearly enough information to be able to evaluate whether the licenses were truly comparable. [REDACTED]

337-TA-1448

[REDACTED]

As discussed above, Nokia's circular references to existing licenses gives no indication as to whether Nokia's offers to Respondents represent an *ex-ante* valuation of the patents.

Nokia has further attempted to evade its obligations under the ITU's policies by contending it need not offer a RAND license for "encoder" claims, even in patents with "decoder" claims. Nokia's assertion that "encoder" claims are not essential hinges on its assumption that the ITU-T IPR policy defines "Patents" as individual claims required to implement a standard, rather than all claims listed in an individual patent. But, as Dr. Simcoe will testify, this definition appeared almost a decade after H.264 lock-in. RX-2071 (containing no definition of "patents"). In fact, the Guidelines for Implementation of the TSB Patent Policy, enforceable at the time of H.264 development, contained *no* definition of patents until 2007, which did not distinguish individual claims of a patent. *Id.*

This distinction that Nokia draws is incongruent with its licensing declaration statements. The statements, as filed, do not carve out the so-called "encoder" claims. In other words, Nokia did not remove these claims from the underlying FRAND commitment. As discussed above, this patents/claims distinction did not exist during the relevant timeline for disclosure. Indeed, if Nokia were to have carved out "encoder" claims from its licensing statement (effectively opting to refuse FRAND licensing), this technology would likely have been eliminated from the Asserted Standards. Nokia cannot use a definition of "Patents" that did not exist at the time of disclosure.

[REDACTED]

In addition, Respondents contend that these “encoding” claims are essential to implement the Asserted Standards. The Common Patent Policy states that “essential patents are patents that would be required to implement a specific Recommendation | Deliverable.” RX-2076. The Asserted Standards’ functionality is defined in terms of decoding. However, to implement the Asserted Standards, the data must be encoded into bitstreams able to be decoded by the Asserted Standards. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Moreover, as Dr. Simcoe will testify, Nokia’s position on essentiality is not compatible with the technology at issue nor the specifications of the Asserted Standards. Nokia cannot prove infringement by simply pointing to the encoding functionality in the Accused Products ability to comply with the Asserted Standards. But this requires that the encoder claims are necessarily infringed by proper implementation of the Asserted Standards, rendering them essential. Similarly, by contending that the Asserted Standards specify only decoders, Nokia chooses to ignore that bitstreams that can be decoded by the Asserted Standards must be encoded into a bitstream compliant with the Asserted Standards. Nokia should not be allowed to contend its encoding claims are both non-essential and that any encoder that generates bitstreams compliant with the Asserted Standards must infringe its encoding patents.

As discussed herein, Nokia’s negotiations with Respondents reveal a practice of coercion and opacity in business practices. Nokia’s refusal to provide any useful information about its sole

[REDACTED]

“justification” for its program rates renders any comparability analysis lacking, and Nokia should not be rewarded for hiding this information. Coercion by litigation and injunctive relief threats is not a negotiation tactic, but a strong-arm tactic. For the reasons discussed above, Nokia’s negotiations with Respondents are inherently asymmetric, unbalanced, and unfair, and Nokia should not be allowed to benefit from its tactics.

3. Wavier, Implied Wavier, and Equitable Estoppel Based on Nokia’s Breach of Its ITU Disclosure Duties

Nokia did not use “best efforts” to identify relevant patents or patent applications to the ITU, JVT, and JVT-VC as required by their respective IPR disclosure policies. Nokia’s failure to disclose was more than just a matter of inadvertence or neglect—demonstrating an affirmative lack of “best efforts.”

For example, as early as 1999, the ITU’s guidelines required that participants in standard setting processes must disclose relevant patents as early as possible “in good faith and on a best effort basis,” stopping short of requiring patent searches. RX-2071. As Dr. Simcoe will testify, SSO disclosure policies serve to empower SSOs to be fully informed when deciding on technology inclusion in a standard and to identify patented technology that an SSO will seek licensing commitments to. In some instances, if SEP owners refuse to commit to license technologies, the SSO will exclude that technology from the standard. Disclosure policies and licensing commitments, then, are distinct pillars of informed standards development, rooted in participants disclosing patents and patent applications “in good faith and on a best effort basis.”

As previously discussed, the Guidelines for Implementation of the ITU/ISO/IEC Common Patent Policy provides disclosure forms to secure this disclosure and licensing commitments. Because ITU-T, ISO, and IEC are not required to conduct patent searches for a full disclosure, the ITU allows SSO participants to submit the “General Patent Statement and Licensing Declaration

[REDACTED]

Form,” allowing SSO participants to extend a FRAND licensing commitment for patents that the participant may own. RX-2071, RX-2076, RX-0608. Importantly, the Guidelines note that this general statement and declaration does not serve as a full replacement for individual patent and application identification. RX-2071 at Section 2.5, p. 4, RX-2076 at Section II.1, p. 6. Identified patents and applications can be listed on ISO/IEC/ITU-T Patent Statement and Licensing Declaration Forms, which allow the SSO participant to also declare its intentions as to whether it will license the technology. *See* RX-2724. In similar fashion to the ISO/IEC/ITU-T declaration forms, the JVT Terms of Reference provide for collecting IPR information from SSO participants, meant to supplement the information provided by ISO/IEC/ITU-T declaration forms. RX-2072.12.

Indeed, Nokia is no stranger to disclosing IPR to SSOs, having made numerous IPR disclosures to, at least ETSI, ATIS, and IEEE.⁴⁸ RX-2720 (ATIS). Nokia understands the risk of late disclosure and/or failure to disclose, at least by virtue of its disclosures with ETSI. RX-1246. Failure to disclose patents and patent applications under the ETSI IPR Policy renders those potential SEPs unenforceable, and even a late disclosure is treated as a breach of the policy. RX-1246.

As Dr. Simcoe will testify, Nokia’s business practices confirm that it was fully capable of identifying and disclosing relevant patents to SSOs, having submitted multiple disclosures to ETSI during the timeframe surrounding H.264 development. Moreover, by virtue of submitting many ISO/IEC/ITU-T Declaration Forms related to the Asserted Standards and identifying individual patents and patent applications, Nokia had knowledge of its obligations to disclose, and yet, Nokia

⁴⁸ “ETSI” refers to the European Telecommunications Standards Institute. “ATIS” refers to the Alliance for Telecommunications Industry Solutions. “IEEE” refers to the Institute of Electrical and Electronics Engineers.

still waited for multiple years after H.264 lock-in to claim part of that standard. RX-2724.

On multiple occasions, Nokia omitted multiple patents and applications and/or failed to update previously submitted forms. For example, in multiple instances, the Asserted Patents' inventors filed patent applications followed by technical contributions to the JVT or JVT-VC. As discussed above, the JVT policy requires a JVT Patent Disclosure Form to accompany JVT and JVT-VC technical contributions, a requirement that was asserted prior to the beginning of JVT and JVT-VC technical meetings. RX-2072. Lending to Nokia's ability to track IPR declarations is its use of internal tools compounded by internal IPR staff not identifying any perceivable harm should Nokia affirmatively disclose these patents and applications to the relevant SSOs. RX-2064 at 53:17-54:20. Accordingly, Nokia breached its disclosure duties to the ITU and JVT, including because it failed to use "best efforts" to identify the Asserted Patents as required. *Qualcomm*, 548 F.3d at 1014-15.

C. Nokia's Claims Against Respondents Are Barred By License, Implied License, and Patent Exhaustion

As set forth above, Respondents' respective Accused Products do not infringe any claim of the Asserted Patents. Nonetheless, any claims of infringement by Nokia are barred under the doctrines of express license and/or patent exhaustion. A patent license is a defense to patent infringement, even when the alleged infringer is a third party to the original license agreement. *See Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 496 (1964) (a third party to a license agreement may also assert a license defense if the third party's actions are within the scope of the license agreement between the patent owner and the licensee). It is well-settled that licensed products are not subject to exclusion by the Commission, including when other products remain

[REDACTED]

subject to exclusionary relief.⁴⁹ Awarding exclusionary relief to Nokia is necessarily incongruent with products under license.

1. Express Interim Licenses with Nokia

As noted above, Nokia's RAND commitment to the ITU-T is a binding contractual obligation, not a mere agreement to negotiate. Moreover, when the SEP holder breaches a RAND commitment by demanding royalty rates that violate its RAND obligations, the Court may supplant the patent holder's terms and impose a court-determined RAND license. *Microsoft Corp v. Motorola, Inc.*, 795 F.3d 1024 (9th Cir. 2015) (holding that a SEP owner's RAND commitment is a binding contractual obligation to grant a license on RAND terms and affirming the district court's judicially determined RAND rates).

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. In other words, Nokia's offers to arbitrate do not suffice for a RAND agreement. Because the ITU-T commitment covers the process *and* end result of a license, simply negotiating is not RAND.

⁴⁹ *Carborundum Co. v. Molten Metal Equip. Innovations, Inc.*, 72 F.3d 872 (Fed. Cir. 1995) (“[A]ll or part of the right to exclude may be waived by granting a license, which may be express . . . an express license[] is a defense to patent infringement.”); *Texas Ins. Inc. v. U.S. Intern. Trade Com’n*, 988 F.2d 1165 (Fed. Cir. 1993) (Federal Circuit corroborated the Commission’s determination that products at issue were protected up to the scope of the license proffered as defense); *Certain Video Displays & Prods.*, Inv. No. 337-TA-828, Order No. 9 at 21 (Aug. 1, 2012) (finding no patent infringement and no violation of Section 337 where ongoing royalty order in separate district court proceeding constituted a license authorizing Respondent to use the asserted patents’ claimed inventions).

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] In effect, once the interim license is offered by Nokia and accepted by Respondents, the Accused Products *will be licensed*. The only change to the interim license may be with regards to the rate, which will be determined at trial.

The interim license with Nokia provides protections to Nokia's economic interests. [REDACTED]

[REDACTED]

[REDACTED] The rate is to be paid as two lump sums: (1) a non-refundable rate, which represents the amount of royalty rate that is not in dispute; and (2) a refundable rate which represents the difference between the refundable rate and the midpoint-derived rate. The refundable lump sum will be credited against the sum that the court decides is RAND at the final trial. If the court determines the final RAND rate to be higher than the interim rate, Nokia will recover the difference from Respondents.

At bottom, Respondents products will be under license for the Asserted Patents for the Asserted Standards, including encoding claims. Because this approach is recognized by the Federal Circuit, exclusionary relief should not issue.

2. Express Licenses with Microsoft

[REDACTED]

3. Implied Licenses with Semiconductor Manufacturers

[REDACTED]

[REDACTED] Notably, by its own representations in this Investigation, Nokia has never demanded a semiconductor manufacturer take a license to its Asserted Standards portfolios. This is significant, given that Nokia’s infringement accusations are sometimes based only upon these third-party semiconductor manufacturers. Supported by Nokia’s volume of licenses for its Asserted Standards portfolios, by failing to pursue licenses with semiconductor manufacturers, Nokia has created an implied license to its technology’s use in downstream chips. *See, e.g., Wang Labs. v. Mitsubishi Elecs.*, 103 F.3d 1571, 1580 (Fed. Cir. 1997).

This implied license bars Nokia from asserting the Asserted Patents in downstream products that incorporate these chips. When these chips are incorporated downstream, Nokia’s patent rights are exhausted as to those products, which are frequently purchased for their ordinary uses, including video encoding and decoding. *See, e.g., Hewlett-Packard v. Repeat-O-Type Stencil*, 123 F.3d 1445, 1451 (Fed. Cir. 1997) (“implied license ... [extends to] any uses of the product to which the parties might reasonably contemplate the product will be put.”); *see also Quanta*

Computer, Inc. v. LG Electronics, Inc., 553 US 617, 638 (2008) (The licensed “sale of an article that substantially embodies a patent exhausts the patent holder’s rights and prevents the patent holder from invoking patent law to control post sale use of the article.”). The implied license is evident where these chips are purchased from the semiconductor manufacturers “off the shelf” for use in downstream products. These products, then, are licensed by Nokia’s implied license and acquiescence to the semiconductor manufacturers. *See Quanta*, 553 U.S. at 638.

Nokia’s express and implied licenses exhaust Nokia’s patent rights in the Asserted Patents, and as such, bar it from asserting infringement claims against Respondents and obtaining exclusionary relief incompatible with public interest considerations.

XII. CONCLUSION

In view of the foregoing, Respondents respectfully request the ALJ enter a finding of no violation.

Dated: January 30, 2026

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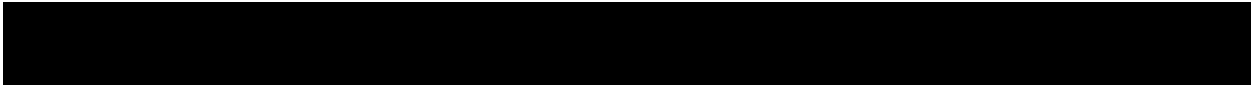
CERTIFICATE OF SERVICE

I, S. Alexandra Santos, hereby certify that on February 6, 2026, copies of the foregoing document were served as follows:

<p>The Honorable Lisa R. Barton Secretary to the Commission U.S. International Trade Commission 500 E Street S.W. Washington, D.C. 20436</p>	<p>☒ Via EDIS ☐ Via Hand Delivery ☐ Via Overnight Delivery ☐ First Class Mail ☐ Not Served</p>
<p>The Honorable MaryJoan McNamara Administrative Law Judge U.S. International Trade Commission 500 E Street, S.W. Room 317 Washington, D.C. 20436 <i>McNamara337@usitc.gov</i></p>	<p>☒ Via EDIS ☒ Via Email/Box Upload ☐ Via Hand Delivery ☐ Via Overnight Delivery ☐ Not Served</p>
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Respondents' Pre-Hearing Brief

APPENDIX

Information Related to '321 Patent Analysis

Claim 8[c] “decoding identifier values for image frames according to numbering scheme”

Variable or Parameter	Present in Bitstream?	Derived/Calculated?	Set by Encoder/Decoder
H.264			
picture_order_cnt_lsb	Yes	No	Encoder
frame_num	Yes	No	Encoder
H.265			
Picture order count		PicOrderCnt is a function that just returns PicOrderCntVal.	
POC value	This language only appears in Dr. Chrissan’s report.		
PicOrderCntVal	No	Yes, calculated using three variables which are also derived. None of those three variables come from the bitstream.	Decoder
AV1			
order_hint	Yes – if enabled	No	Encoder
OrderHint	No	Yes (pg 151 states it is “computed”). This is the decoder-side variable that holds order_hint.	Decoder
OrderHints – a 7-element array	No	Yes.	Decoder
ref_order_hint – an 8-element array	Yes – if enabled. And then only for non-intra frames, or when the complete refresh flag is not enabled.	No	Encoder
display_frame_id	Yes if enabled; only when (previously decoded) stored reference frames are to be displayed.	No	Encoder
current_frame_id	Yes, if enabled	No. This value is associated information with the reference frame and is stored in the	Encoder

Variable or Parameter	Present in Bitstream?	Derived/Calculated?	Set by Encoder/Decoder
		corresponding RefFrameId array if enabled.	
RefFrameId – an 8-element array	No – and only derived if enabled.	Derived from other values. Specifies the frame id for each reference frame - it contains the current_frame_id at the time the frame was stored	Decoder

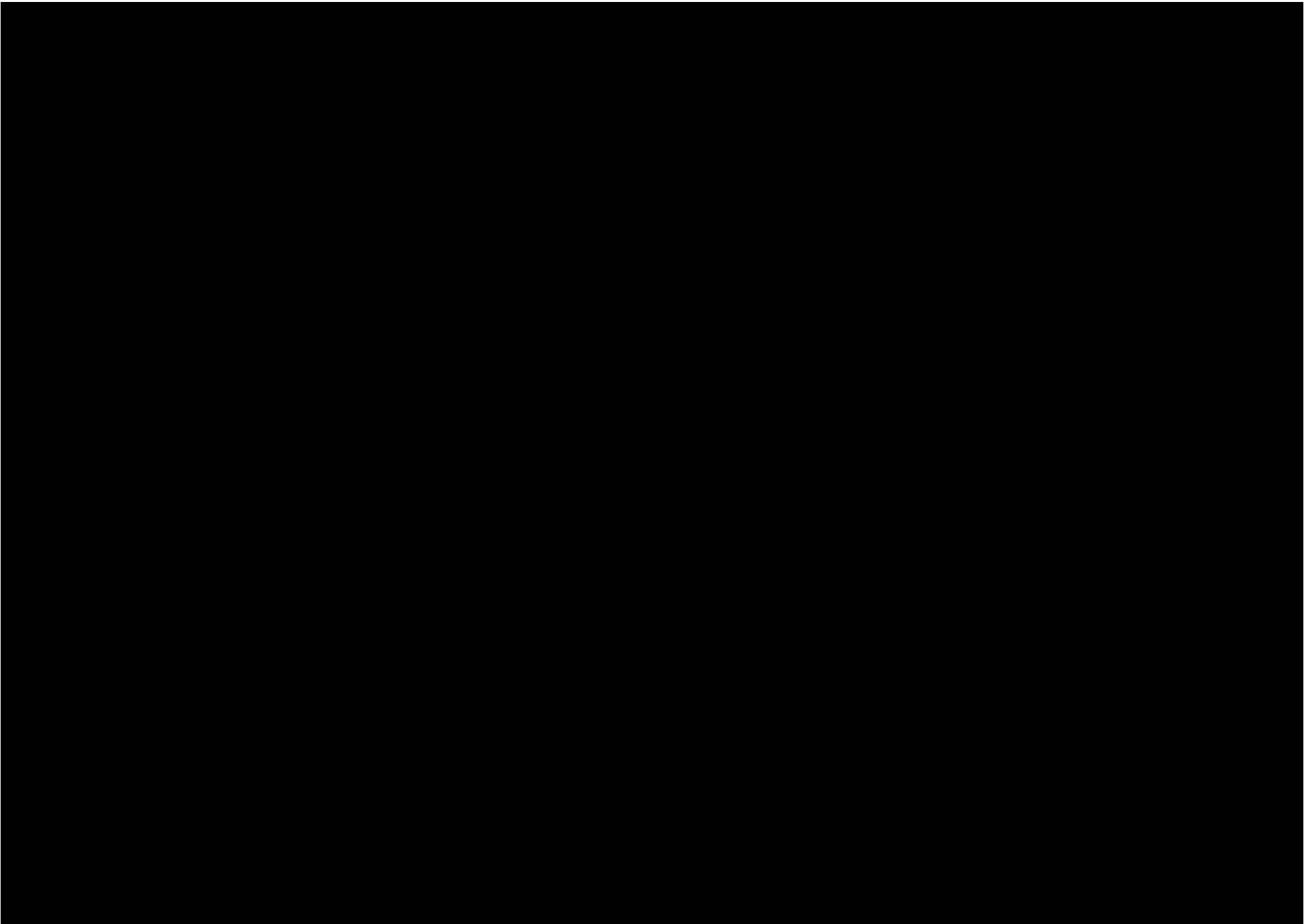
Claim 8[d] “resetting the identifier value for the indicated first image frame of the independent sequence.”

Variable or Parameter	Present in Bitstream?	Derived/Calculated?	Set by Encoder/Decoder
H.264			
prevPicOrderCntMsb	No	Yes	Decoder
prevPicOrderCntLsb	No	Yes	Decoder
frame_num	Yes	No	Encoder
H.265			
PicOrderCntVal	No	Yes, calculated using three variables which are also derived. None of those three variables come from the bitstream.	Decoder
AV1			
Key Frame	Yes – not an identifier value according to a numbering scheme	No	Encoder
order_hint ¹	Yes	No	Encoder
OrderHint ²	No	Yes	Decoder
OrderHints – a 7-element array ³	No	Yes	Decoder

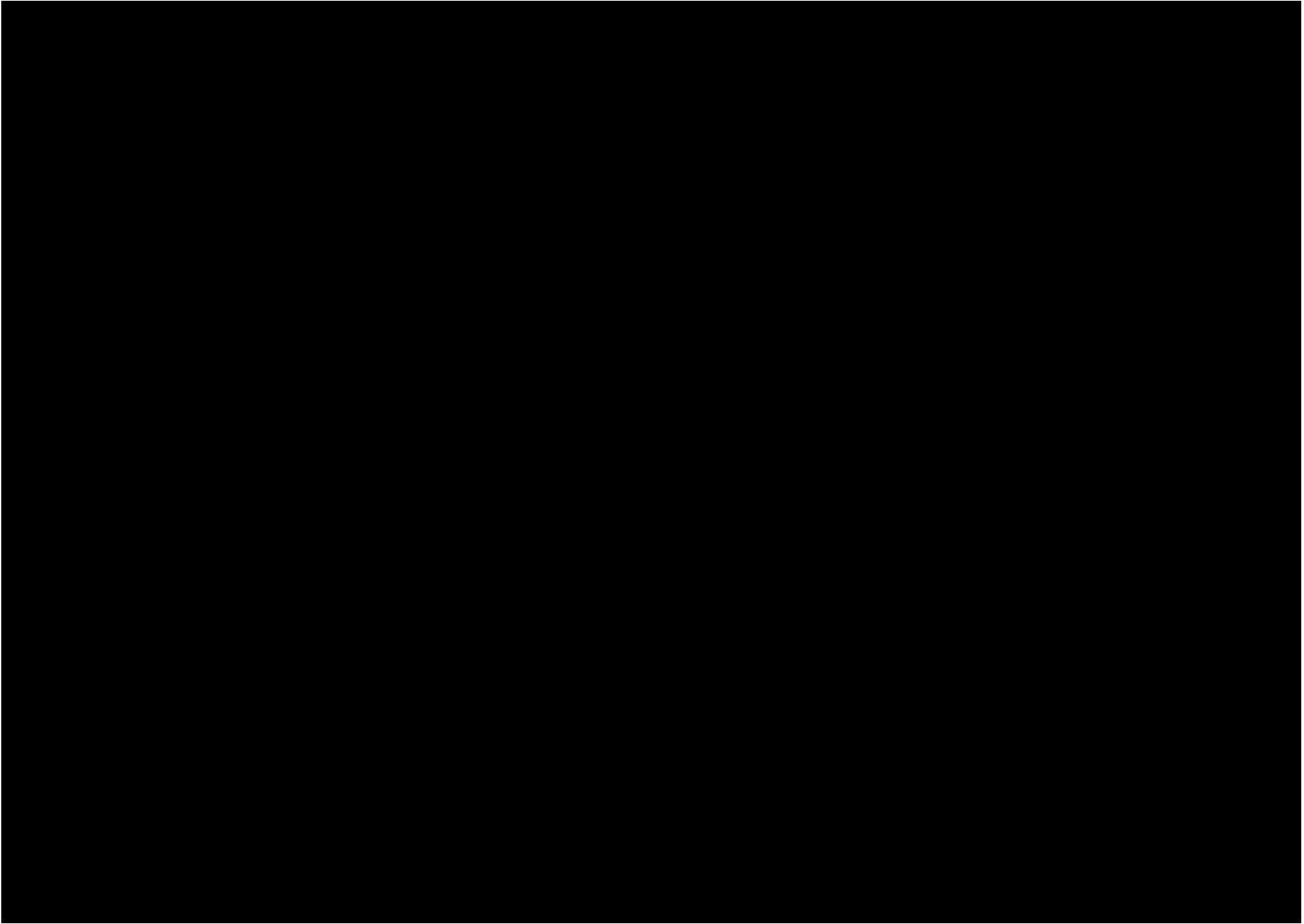
¹ Dr. Hemami notes that Dr. Chrissan identified “Order Hint” which does not appear in the AV1 specification.

² Dr. Hemami notes that Dr. Chrissan identified “Order Hint” which does not appear in the AV1 specification.

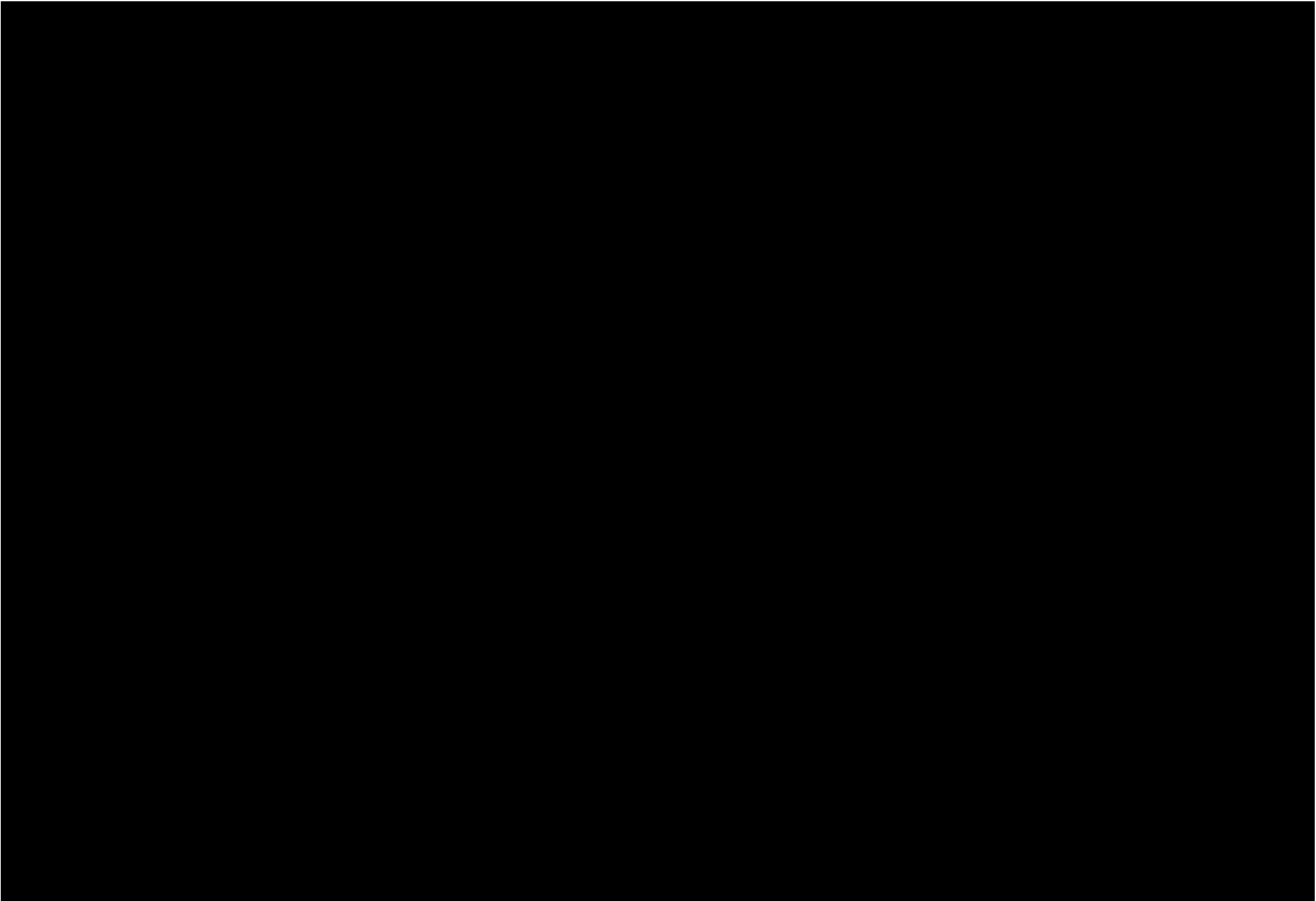
³ Dr. Hemami notes that Dr. Chrissan identified “Order Hint” which does not appear in the AV1 specification.



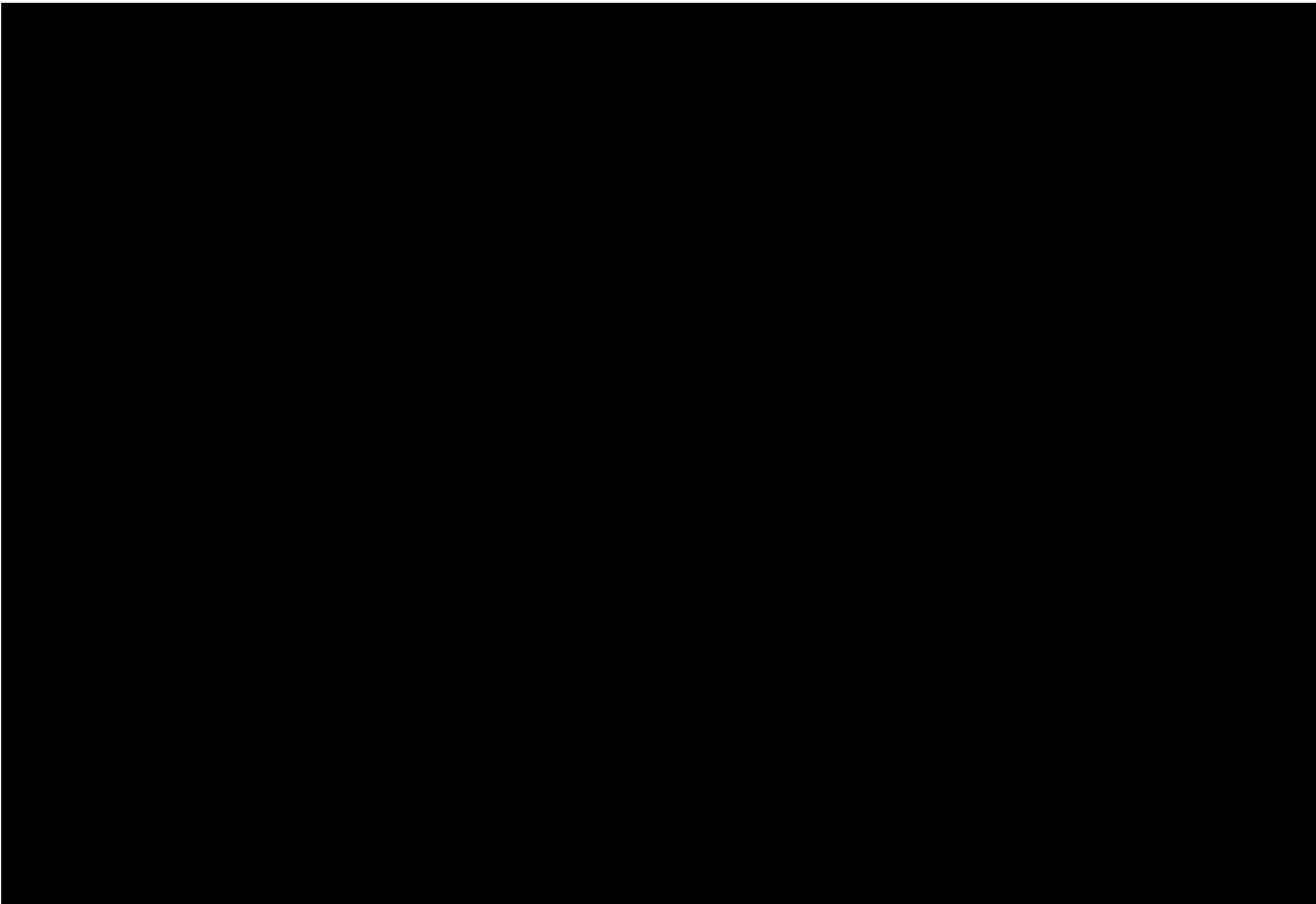
R-APPX at 3



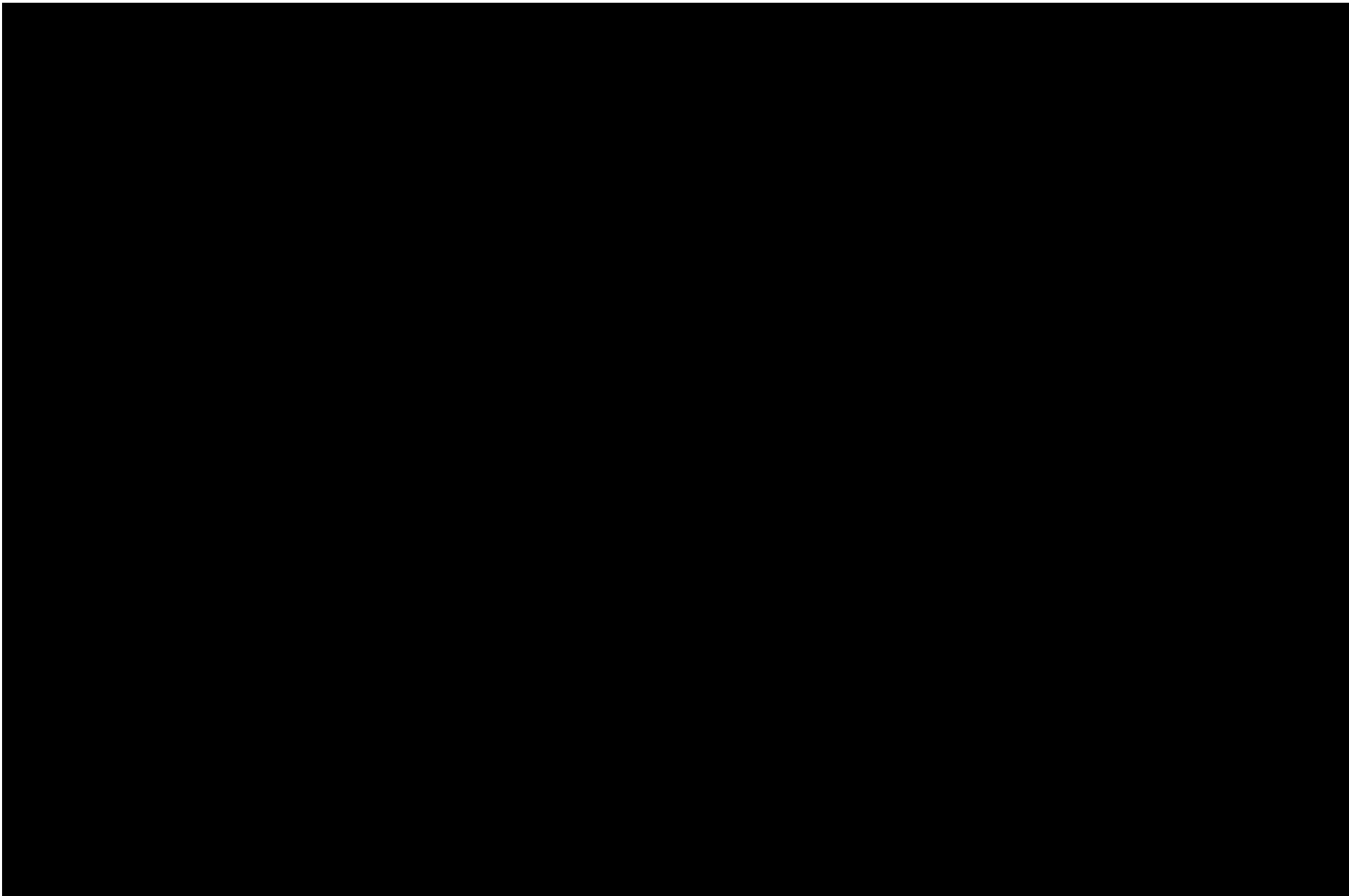
R-APPX at 4



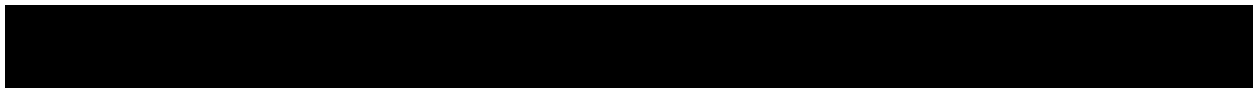
R-APPX at 5



R-APPX at 6



R-APPX at 7



	Length 13 Closed GOP													Picture type		
														I	Effective P-Pictures (P or B*)	B
Temporal Reference	0	1	2	3	4	5	6	7	8	9	10	11	12			
Start with I-picture	I	B	B	P	B	B	P	B	B	P	B	B	P	1	4	8
Start with B-pictures, option 1	B*	B*	I	B	B	P	B	B	P	B	B	B	P	1	5	7
Start with B-pictures, option 2	B*	B*	I	B	B	B	P	B	B	B	P	B	P	1	5	7
Start with B-pictures, option 3	B*	B*	I	B	B	P	B	B	P	B	P	B	P	1	6	6

Dr. Hemami's efficiency analysis with respect to closed GOPs with leading B frames.

Dr. Hemami's Analysis as to Obvious Methods for Revising MPEG-1 where a Decoder Resets the Temporal Reference

Example 1: Temporal Reference Is Not Decoded for the First Frame, But Is Reset

2.4.2.4 Group of pictures layer

Syntax	No. of bits	
group_of_pictures() {		
group_start_code	32	
time_code	25	
closed_gop	1	Set pic_num = 0
broken_link	1	/* internal variable for number of
next_start_code()		decoded pictures */
if (nextbits() == extension_start_code) {		
extension_start_code	32	
while (nextbits() != '0000 0000 0000 0000 0001') {		
group_extension_data	8	
}		
next_start_code()		
}		
if (nextbits() == user_data_start_code) {		
user_data_start_code	32	
while (nextbits() != '0000 0000 0000 0000 0001') {		
user_data	8	
}		
next_start_code()		
}		
do {		
picture()		pic_num = pic_num + 1
} while (nextbits() == picture_start_code)		
}		

2.4.2.5 Picture layer

Syntax	No. of bits	
picture() {		
picture_start_code	32	
temporal_reference	10	if ((pic_num == 0) && (closed_gop == 1) {
picture_coding_type	3	temporal_reference = 0
vbm_delay	16	}
if ((picture_coding_type == 2) (picture_coding_type == 3)) {		else {
full_pel_forward_vector	1	temporal_reference
forward_f_code	3	/* decode the 10 bit temporal_reference
}		information from the bitstream */
if (picture_coding_type == 3) {		}
full_pel_backward_vector	1	
backward_f_code	3	
}		
while (nextbits() == '1') {		
extra_bit_picture	1	
extra_information_picture	8	
}		
extra_bit_picture	1	
next_start_code()		
if (nextbits() == extension_start_code) {		
extension_start_code	32	
while (nextbits() != '0000 0000 0000 0000 0001') {		
picture_extension_data	8	
}		
next_start_code()		
}		
if (nextbits() == user_data_start_code) {		
user_data_start_code	32	
while (nextbits() != '0000 0000 0000 0000 0001') {		
user_data	8	
}		
next_start_code()		
}		
do {		
slice()		
} while (nextbits() == slice_start_code)		
}		

Example 2: Temporal Reference Is Decoded and Reset for the First Frame

2.4.2.4 Group of pictures layer

Syntax	No. of bits	
group_of_pictures() {		
group_start_code	32	
time_code	25	
closed_gop	1	Set pic_num = 0
broken_link	1	/* internal variable for number of decoded pictures */
next_start_code()		
if (nextbits() == extension_start_code) {		
extension_start_code	32	
while (nextbits() != '0000 0000 0000 0000 0000 0001') {		
group_extension_data	8	
}		
next_start_code()		
}		
if (nextbits() == user_data_start_code) {		
user_data_start_code	32	
while (nextbits() != '0000 0000 0000 0000 0000 0001') {		
user_data	8	
}		
next_start_code()		
}		
do {		
picture()		pic_num = pic_num + 1
} while (nextbits() == picture_start_code)		
}		

2.4.2.5 Picture layer

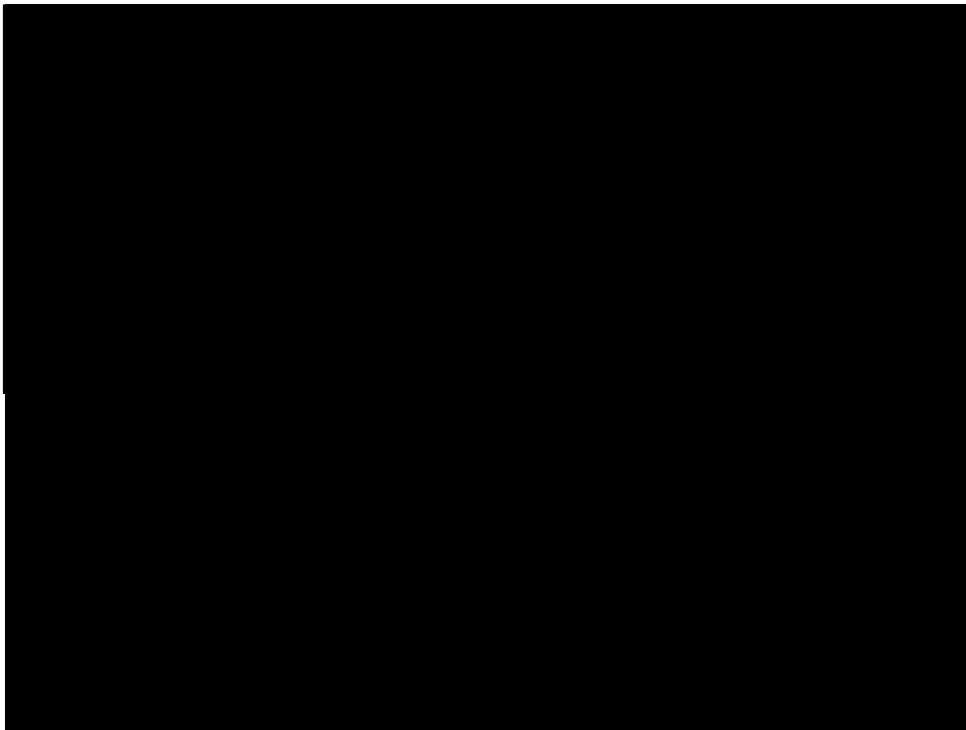
Syntax	No. of bits	
picture() {		
picture_start_code	32	
temporal_reference	10	if ((pic_num == 0) && (closed_gop == 1) {
picture_coding_type	3	temporal_reference = 0
vbv_delay	16	}
if ((picture_coding_type == 2) (picture_coding_type == 3)) {		
full_pel_forward_vector	1	
forward_f_code	3	
}		
if (picture_coding_type == 3) {		
full_pel_backward_vector	1	
backward_f_code	3	
}		
while (nextbits() == '1') {		
extra_bit_picture	1	
extra_information_picture	8	
}		
extra_bit_picture	1	
next_start_code()		
if (nextbits() == extension_start_code) {		
extension_start_code	32	
while (nextbits() != '0000 0000 0000 0000 0000 0001') {		
picture_extension_data	8	
}		
next_start_code()		
}		
if (nextbits() == user_data_start_code) {		
user_data_start_code	32	
while (nextbits() != '0000 0000 0000 0000 0000 0001') {		
user_data	8	
}		
next_start_code()		
}		
do {		
slice()		
} while (nextbits() == slice_start_code)		
}		

Asserted '701 Patent Claims

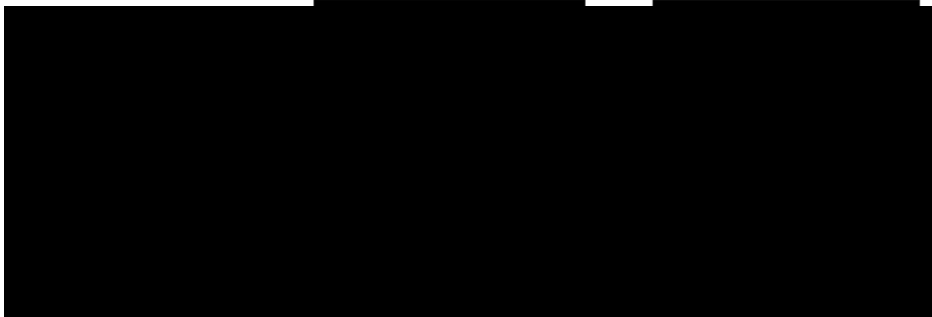
[pre]	1. A method comprising:	8. An apparatus comprising at least one processor and at least one memory including computer program code, the at least one memory and the computer program code configured to, with the processor, cause the apparatus to at least:
[a]	determining a frequency of occurrence threshold based on an expected frequency of occurrence of syntax elements in a bit stream;	determine a frequency of occurrence threshold based on an expected frequency of occurrence of syntax elements in a bit stream;
[b]	categorizing a plurality of syntax elements of video content into first and second categories based on the frequency of occurrence threshold, wherein syntax elements which occur greater than the frequency of occurrence threshold are categorized into the first category and syntax elements which occur less than the frequency of occurrence are categorized into the second category;	categorize a plurality of syntax elements of video content into first and second categories based on the frequency of occurrence threshold, wherein syntax elements which occur greater than the frequency of occurrence threshold are categorized into the first category and syntax elements which occur less than the frequency of occurrence are categorized into the second category;
[c]	entropy coding symbols that correspond to the first category of syntax elements and that have been subjected to a context update; and	entropy code symbols that correspond to the first category of syntax elements and that have been subjected to a context update; and
[d]	entropy coding symbols that correspond to the second category of syntax elements and that have bypassed context updating.	entropy code symbols that correspond to the second category of syntax elements and that have bypassed context updating.
Cl. 6/13	6. A method according to claim 1 wherein categorizing the plurality of syntax elements comprises categorizing the plurality of syntax elements based on a relationship of the frequency of occurrence of the syntax elements to a predefined threshold.	13. An apparatus according to claim 8 wherein the at least one memory and the computer program code are configured to, with the processor, cause the apparatus to categorize the plurality of syntax elements by categorizing the plurality of syntax elements based on a relationship of the frequency of occurrence of the syntax elements to a predefined threshold.



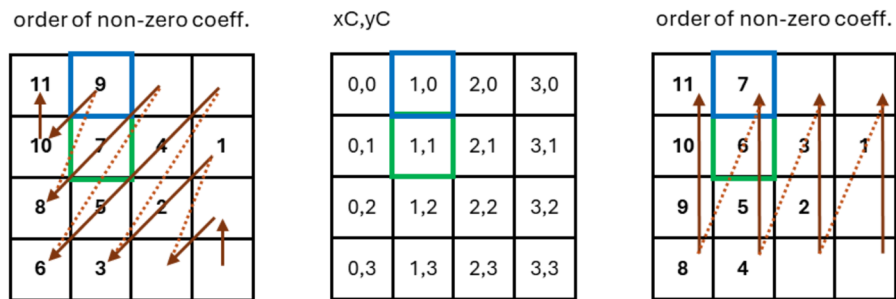
Figures Related to the Analysis of the '701 Patent



Chrissan Rpt. App. C-1 at 163 (order and (xC, yC) graphs added).



Chrissan Rpt. App. C-1 at 163 (middle), 46 (right) (order graph added).



Schonfeld Rebuttal Rpt. ¶ 278.

[REDACTED]

[REDACTED]

Chrissan Rpt. App. C-1 at 16.

R-APPX at 13

[REDACTED]

[REDACTED]

Chrissan Rpt. App. C-1 at 16.

R-APPX at 14

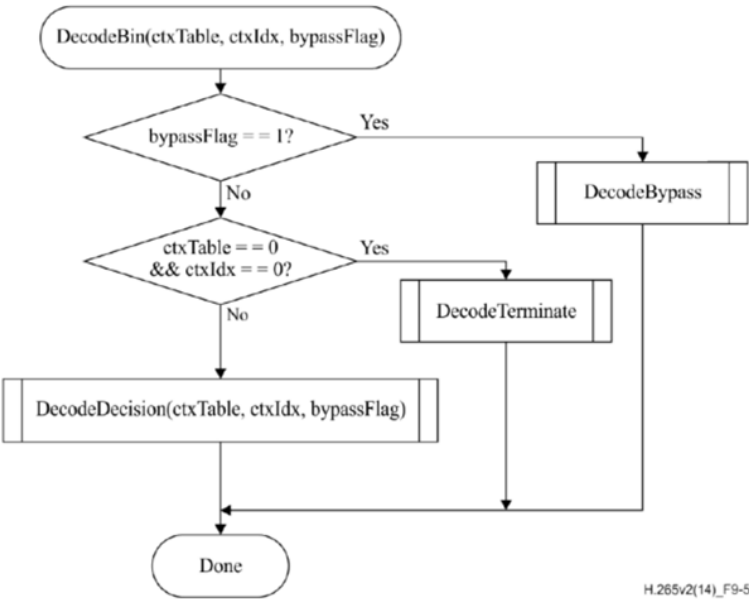
for(n = (i == lastSubBlock) ? lastScanPos - 1 : 15; n >= 0; n--) {	
xC = (xS << 2) + ScanOrder[2][scanIdx][n][0]	
yC = (yS << 2) + ScanOrder[2][scanIdx][n][1]	
if(coded_sub_block_flag[xS][yS] && (n > 0 !inferSbDcSigCoeffFlag)) {	
sig_coeff_flag[xC][yC]	ae(v)
if(sig_coeff_flag[xC][yC])	
inferSbDcSigCoeffFlag = 0	
}	
}	

H.265 Standard at 59, § 7.3.8.11.

Table 9-48 – Assignment of ctxInc to syntax elements with context coded bins

Syntax element	binIdx					
	0	1	2	3	4	>= 5
sig_coeff_flag[][]	0..43 (clause 9.3.4.2.5)	na	na	na	na	na
coeff_abs_level_greater1_flag[]	0..23 (clause 9.3.4.2.6)	na	na	na	na	na
coeff_abs_level_greater2_flag[]	0..5 (clause 9.3.4.2.7)	na	na	na	na	na
coeff_abs_level_remaining[]	bypass	bypass	bypass	bypass	bypass	bypass
coeff_sign_flag[]	bypass	na	na	na	na	na

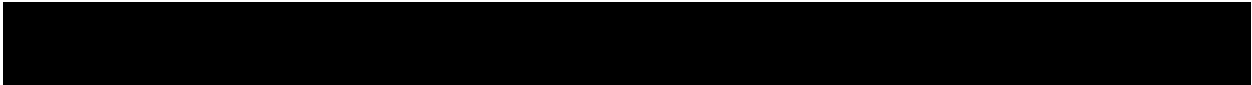
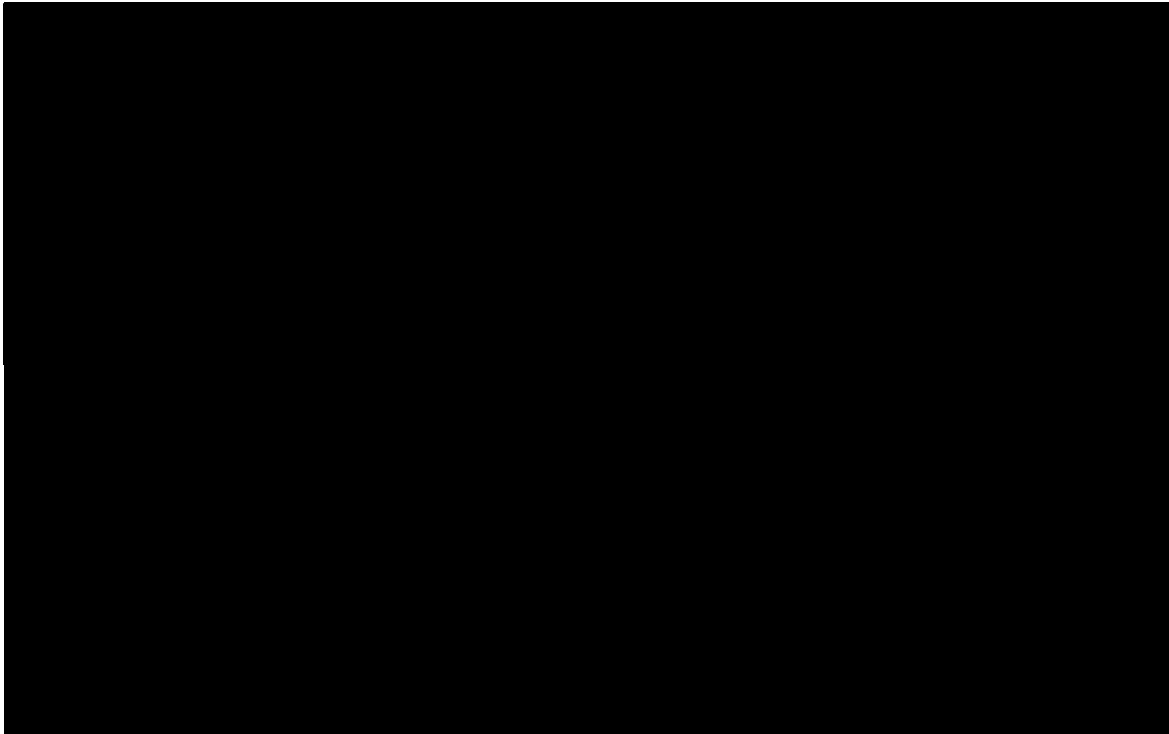
H.265 Standard at 228-29.



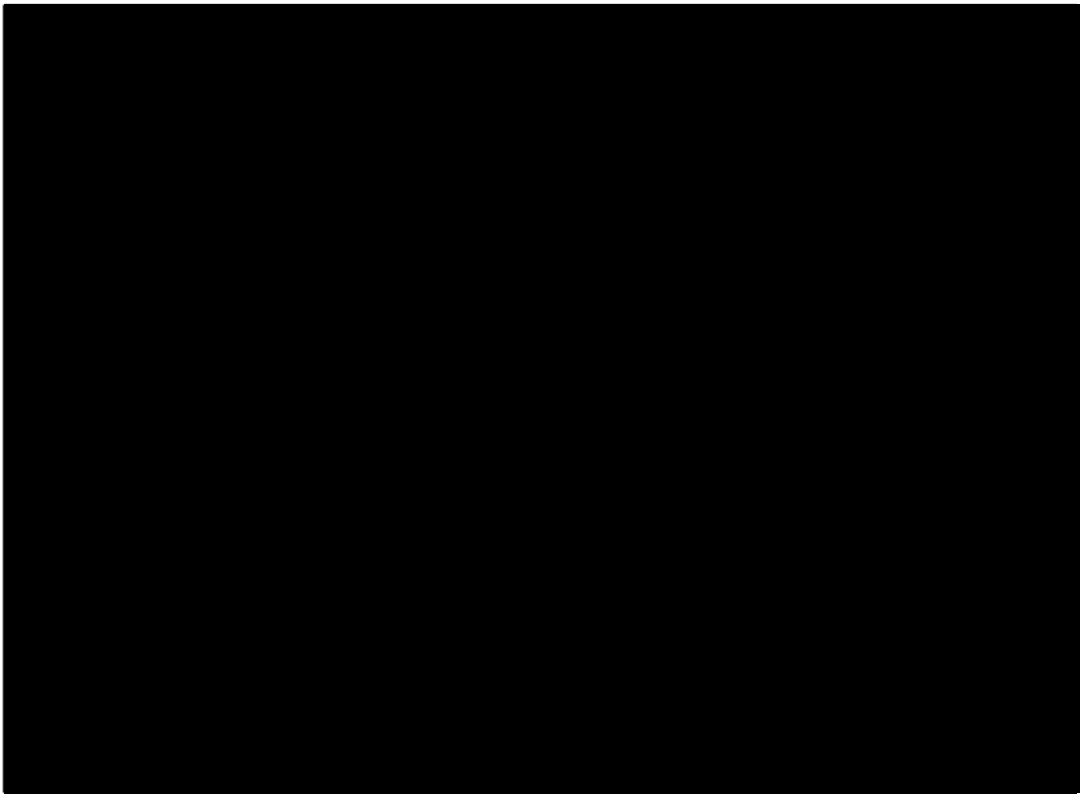
H.265v2(14)_F9-5

Figure 9-5 – Overview of the arithmetic decoding process for a single bin (informative)

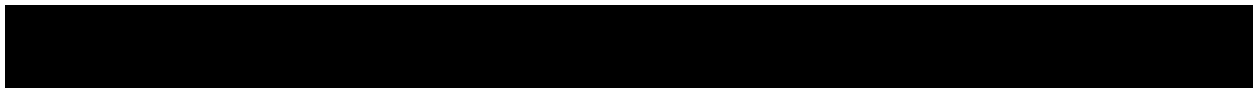
H.265 Standard at 234, Fig. 9-5.



Chrissan Rpt. App. C-1 at 80.



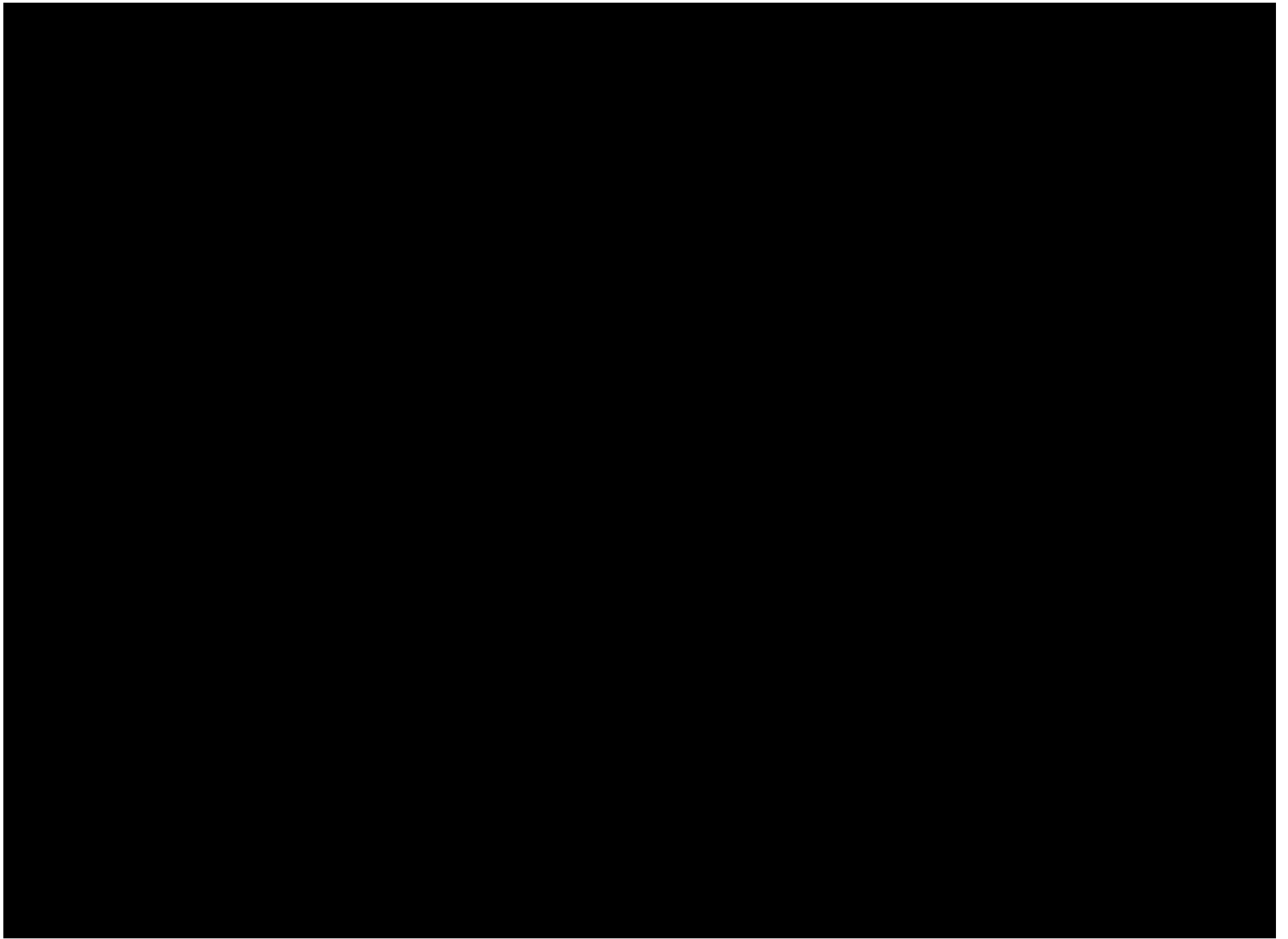
Chrissan Rpt. App. C-1 at 14.



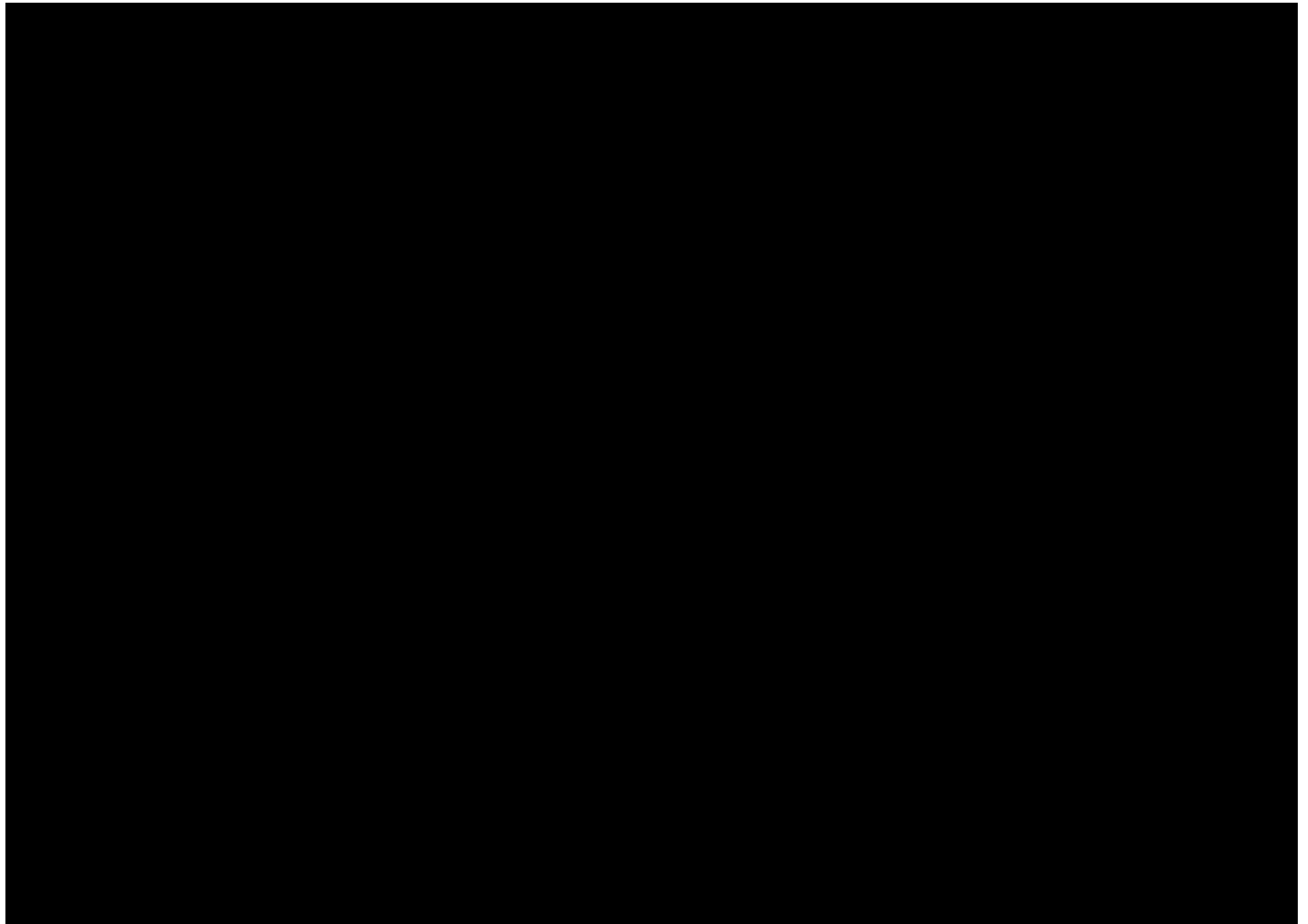
<u>c1NumFlags = (numG1[xCG + 1][yCG] + numG1[xCG][yCG + 1] >= 2) ? 2 : 8</u>	
<u>c2NumFlags = (numG1[xCG + 1][yCG] + numG1[xCG][yCG + 1] >= 2) ? 0 : 1</u>	
for(n = 15; n >= 0; n--) {	
xC = ScanOrder[log2TrafoWidth][log2TrafoHeight][scanIdx][n + offset][0]	
yC = ScanOrder[log2TrafoWidth][log2TrafoHeight][scanIdx][n + offset][1]	
if(significant_coeff_flag[xC][yC]) {	
if(numSigCoeff < 8) {	
<u>if(numSigCoeff < c1NumFlags)</u>	
coeff_abs_level_greater1_flag[n]	ae(v)
numSigCoeff++	
if(coeff_abs_level_greater1_flag[n] && firstGreater1CoeffIdx == -1)	
firstGreater1CoeffIdx = n	
}	
if(lastNZPosInCG == -1)	
lastNZPosInCG = n	
firstNZPosInCG = n	
}	

RX-2264 (JCTVC-I0281) at 7 (colors in native).

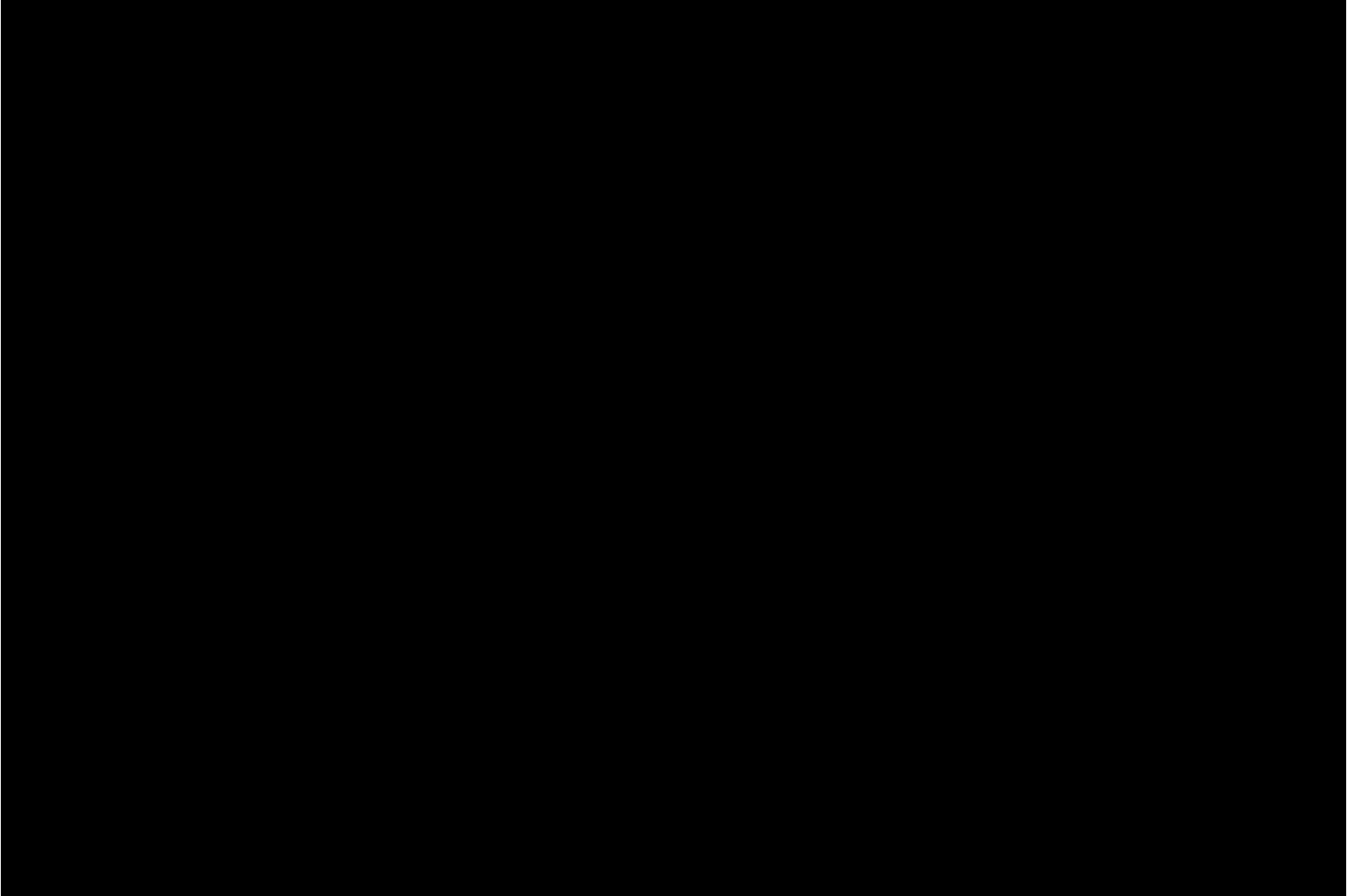
Pages in App. C.1	# coeff_abs_level_greater1_flag	# coeff_abs_level_remaining
14-16	8	8
20-21	4	0
41-43	8	6
46-47	5	0
76-77	8	4
81-82	6	3
135-136	8	2
139-141	4	2
162-164	8	4
167-168	3	1



R-APPX at 18



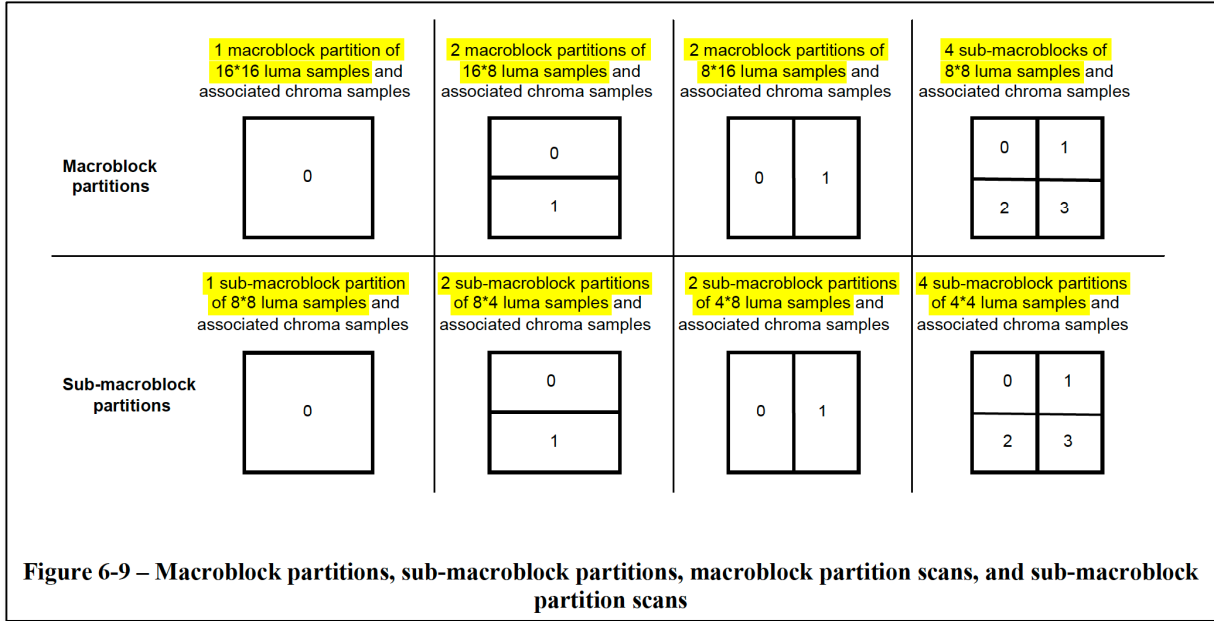
R-APPX at 19



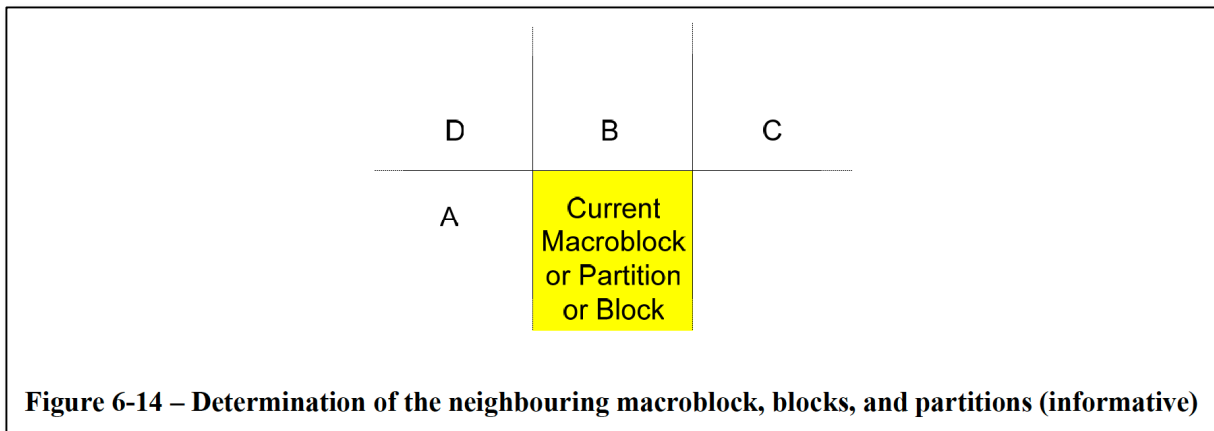
R-APPX at 20

Figures Related to the Analysis of the '714 Patent

RX-1936 (H.264 Standard, 3/2005) at 25, Figure 6-9.

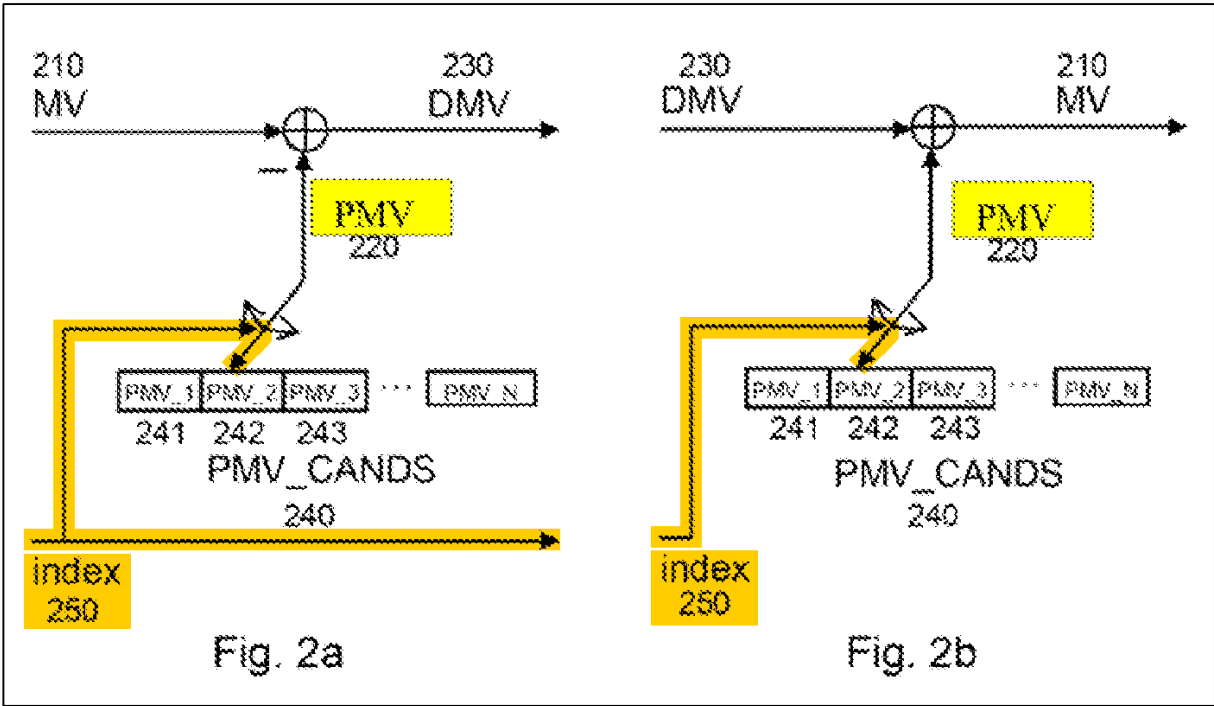


RX-1936 (H.264 Standard, 3/2005) at 29, Figure 6-14.





RX-2004 (Rusert) at Figs. 2a (encoding) and 2b (decoding) (both annotated)

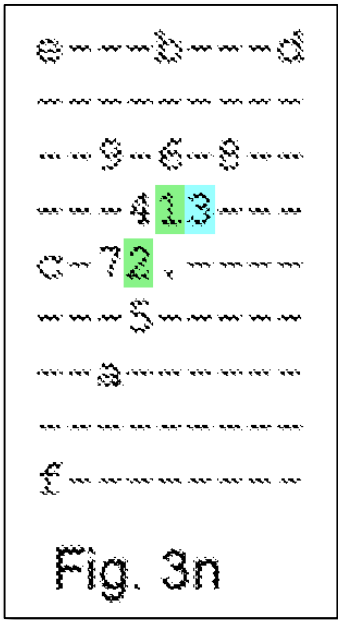


RX-2004(Rusert) at Fig. 3n (annotated)

RX-2004 (Rusert) at Figs. 3a and 3b

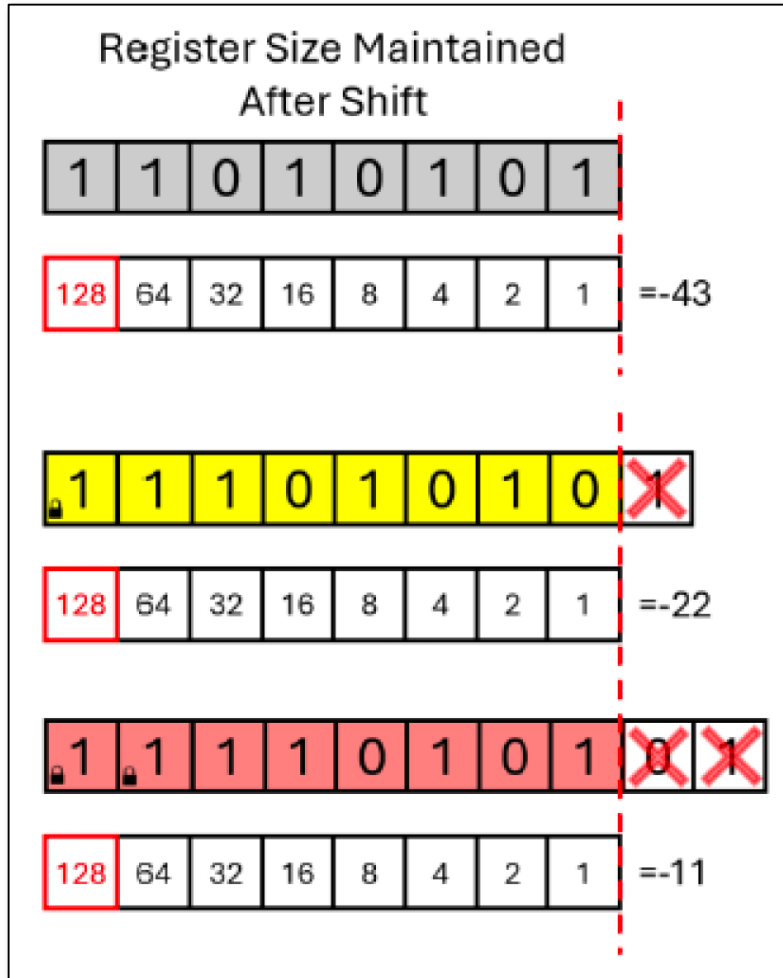
85458	ld9em
82125	f516g
41.14	a2.3b
82125	h748i
85458	njcko

Fig. 3a Fig. 3b

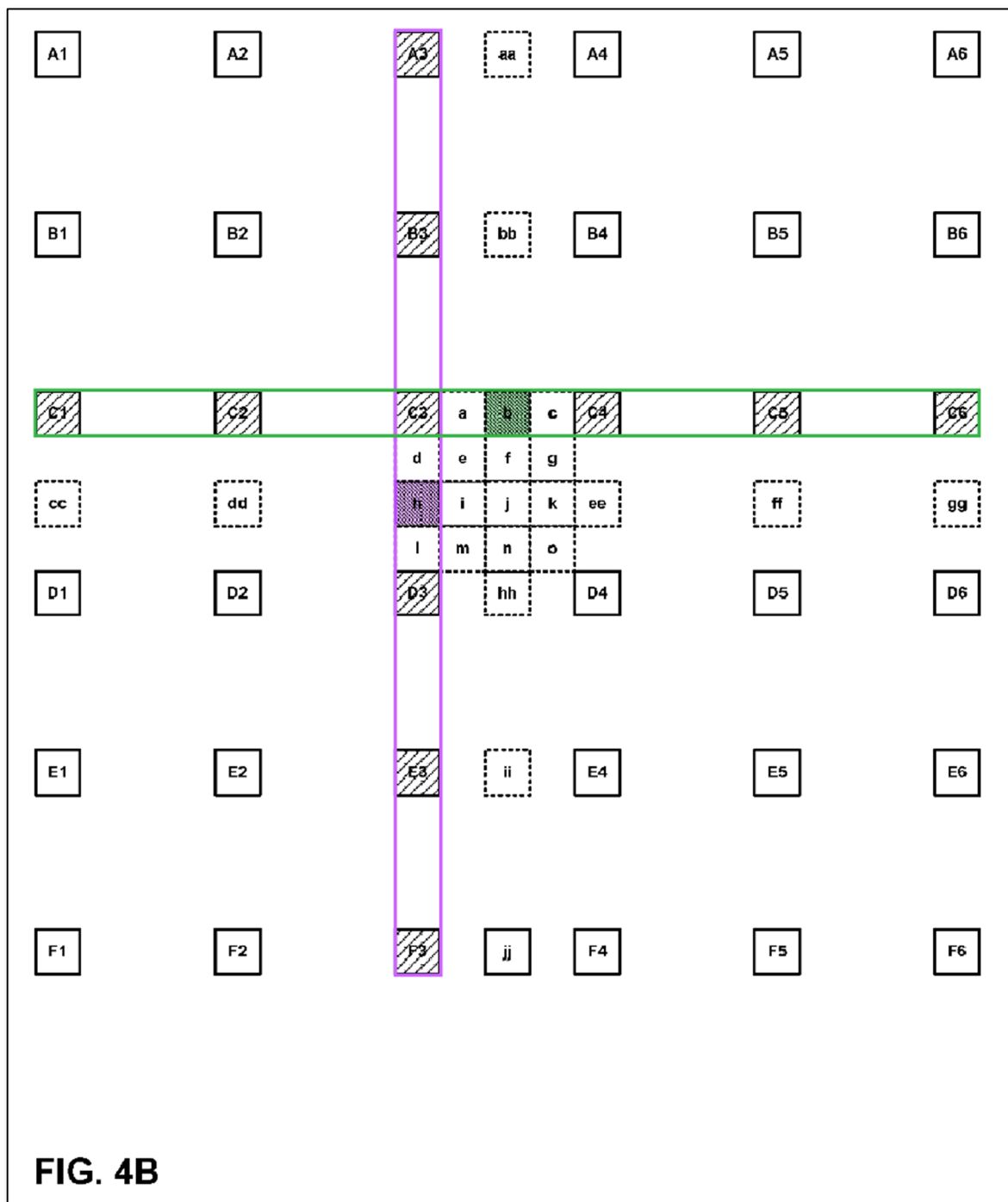


Figures Related to the Analysis of the '267 Patent

**Figure from Rebuttal Report of Dr. Schonfeld (¶ 55)
(colorizing a figure from Moulin Op. Rpt. at ¶ 58)**



Karczewicz '499 (RX-2029) at Fig. 4B
 (annotated to show interpolation of sub-pixel location 'b' (green)
 and sub-pixel location 'h' (pink))



Karczewicz '499 (RX-2029) at Tables 2 and 4

TABLE 2

```
e = (b + h + 1) >> 1
g = (b + ee + 1) >> 1
m = (h + hh + 1) >> 1
o = (ee + hh + 1) >> 1
```

TABLE 4

```
e = (b1 + h1 + 32) >> 6
g = (b1 + ee1 + 32) >> 6
m = (h1 + hh1 + 32) >> 6
o = (ee1 + hh1 + 32) >> 6
```

Karczewicz '499 (RX-2029) at Table 5 (annotated)

TABLE 5

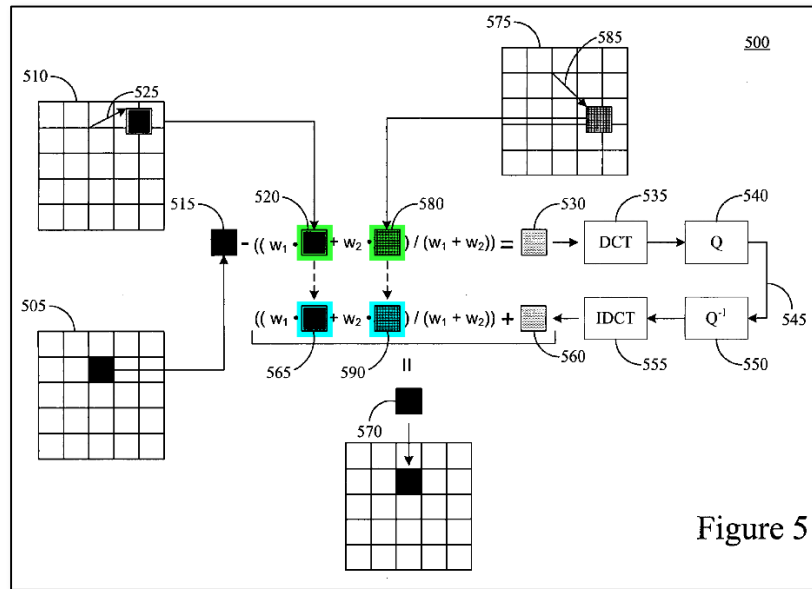
positions {a, c, d, l} of FIGS. 4A-4D

Operation	Comment	Min value	Max value	Register size
r1 = x	r1 is integer pixel x	0	255	8u
r1 = r1 << 5	r1 is 32 * x	0	8160	13u
r2 = y0	r2 is y0 (y0 is a one-dimensional (1-D) half-pixel such as b1, h1, ee1 and hh1 before shifting down)	-2550	10710	15s
r1 = r1 + r2	r1 is 32 * x + y0	-2550	18870	16s
r1 = r1 + 32	r1 is 32 * x + y0 + 32	-2518	18902	16s
r1 = r1 >> 6	r1 is (32 * x + y0 + 32) >> 6	-39	295	11s
r1 = max (0, r1)	clip r1 on the low side	0	295	10u
r1 = min (255, r1)	clip r1 on the high side	0	255	8u

Karczewicz '499 (RX-2029) at Table 6 (annotated)

TABLE 6				
positions {e, g, m, o} of FIGS. 4A-4D				
Operation	Comment	Min value	Max value	Register size
r1 = y0	r1 is y0 (y0 is a 1-D half-pixel such as b1, h1, ee1 and hh1 before shifting down)	-2550	10710	15s
r2 = y1	r2 is y1 (y1 is a 1-D half-pixel such as b1, h1, ee1 and hh1 before shifting down)	-2550	10710	15s
r1 = r1 + r2	r1 is y0 + y1	-5100	21420	16s
r1 = r1 + 32	r1 is y0 + y1 + 32	-5068	21452	16s
r1 = r1 >> 6	r1 is (y0 + y1 + 32) >> 6	-79	335	11s
r1 = max(0, r1)	clip r1 on the low side	0	335	10u
r1 = min(255, r1)	clip r1 on the high side	0	255	8u

Walker, Figure 5 (annotated) (RX-2018)



Walker, Equation 13 (annotated) (RX-2018 at ¶ 59)

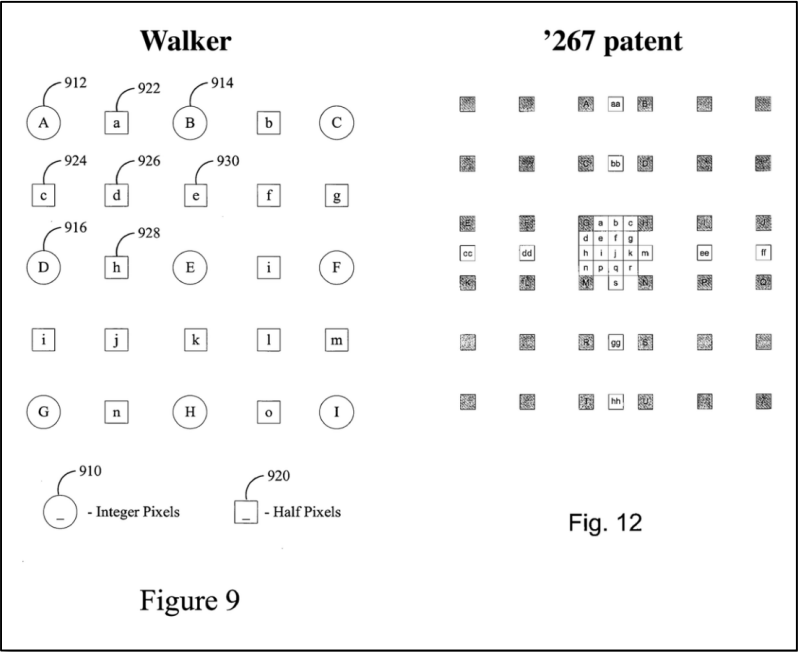
$$Final_pred = Clip1[(((pred0)w0 + (pred1)w1 + 2^{\log WD}) >> (\log WD + 1)) + ((o_0 + o_1 + 1) >> 1)] \quad (13)$$

Walker, Table 2 (annotated) (RX-2018 at ¶ 84)

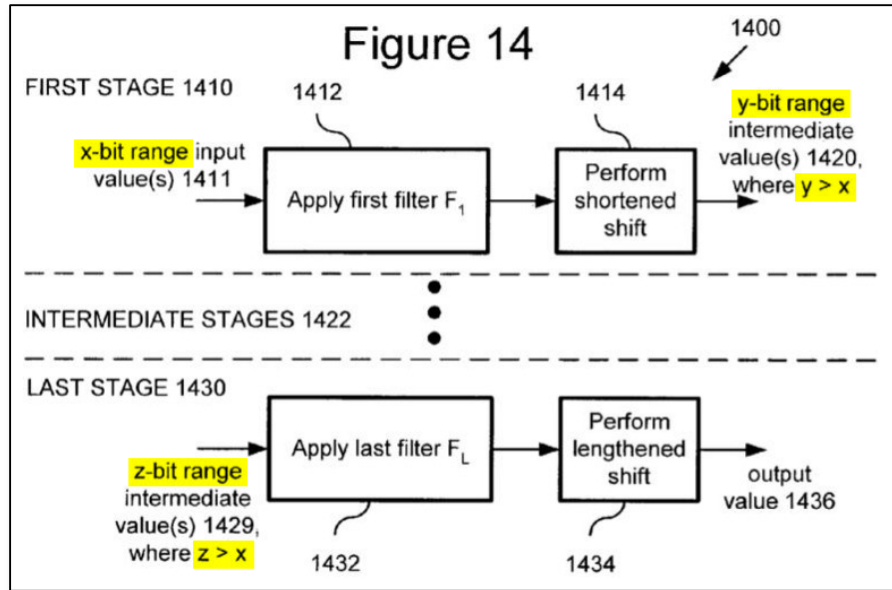


TABLE 2			
Op- eration No.	Operation	Bitwidths Involved	Bitwidth of Operation Result
1	(pred0)w0, (pred1)w1	8 bits * 8 bits	16
2	$2^{\text{LWD}-1}$	logWD has a maximum value of 7, therefore LWD - 1 has a maximum value of 7 for case 3	7
3	(pred0)w0 + (pred1)w1 + $2^{\text{LWD}-1}$	16 bits + 16 bits + 7 bits	18
4	$((\text{pred0})w0 + (\text{pred1})w1 + 2^{\log\text{WD}}) \gg (\text{LWD} + 1)$	(18 bits) >> (8 bits)* *maximum value of LWD + 1	10
5	$(o_0 + o_1 + 1) \gg (1)$	(8 bits + 8 bits + 1) >> (1)	8
6	Clip1[Op. 4 + Op. 5] (for Clip1, see Eq. (11))	Clip1[10 bits + 8 bits]	8

Walker, Figure 9 (RX-2018 at Figure 9) and '267 patent at 12:56-63, Fig. 12



Srinivasan, Figure 14 (annotated) (RX-2024 at Fig. 14)



Walker, Equation 18 (annotated) (RX-2018 at ¶ 92)

$$pred_{ij} = (((((pred0)w_A) \gg 6 + ((pred1)w_B) \gg 6) + 2^7) \gg 8 + \text{Offset} \quad (18)$$

Walker, Table 4 (annotated) (RX-2018 at ¶¶ 92-93)

TABLE 4			
Operation No.	Operation	Bitwidths Involved	Bitwidth of Operation Result
1	$(pred0) w_A,$ $(pred1) w_B$	8 bits * 15 bits	23
2	$((pred0) w_A) \gg 6 + ((pred1) w_B) \gg 6 + 2^7$	17 bits + 17 bits + 7 bits	19
3	$((pred0) w_A) \gg 6 + ((pred1) w_B) \gg 6 + 2^7) \gg (8)$	(19 bits) >> (8 bits)	11
4	$(o_0 + o_1 + 1) \gg (1)$	(8 bits + 8 bits + 1) >> (1)	8
5	Clip1[Op. 3 + Op. 4] (for Clip1, see Eq. (11))	Clip1[11 bits + 8 bits]	8

[REDACTED]

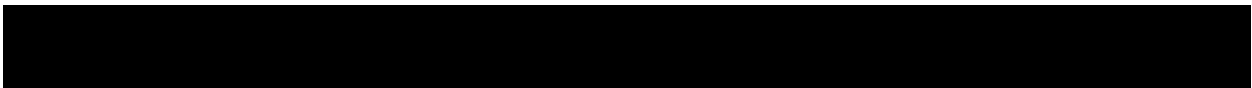
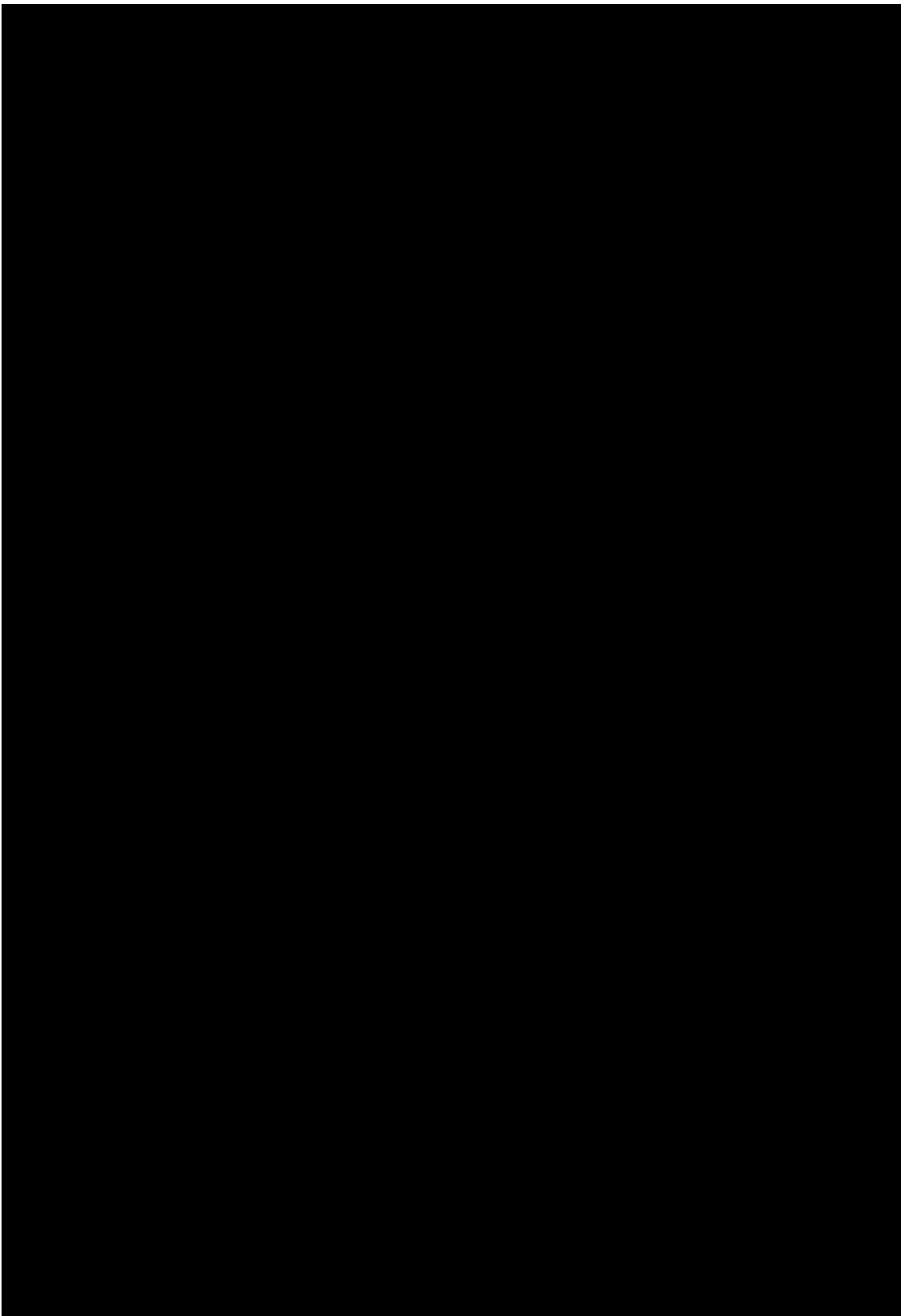
[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



[REDACTED]

[REDACTED]

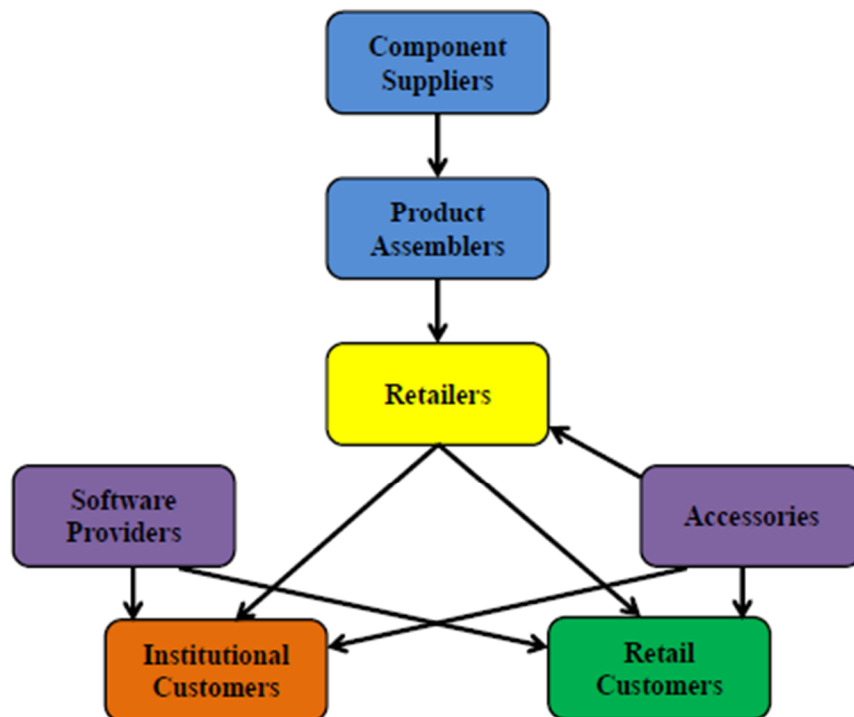
[REDACTED]

[REDACTED]

FIGURE 5: CONSUMER WELFARE DECOMPOSITION



FIGURE 6: EXAMPLE SUPPLY CHAIN LINKAGES



[REDACTED]

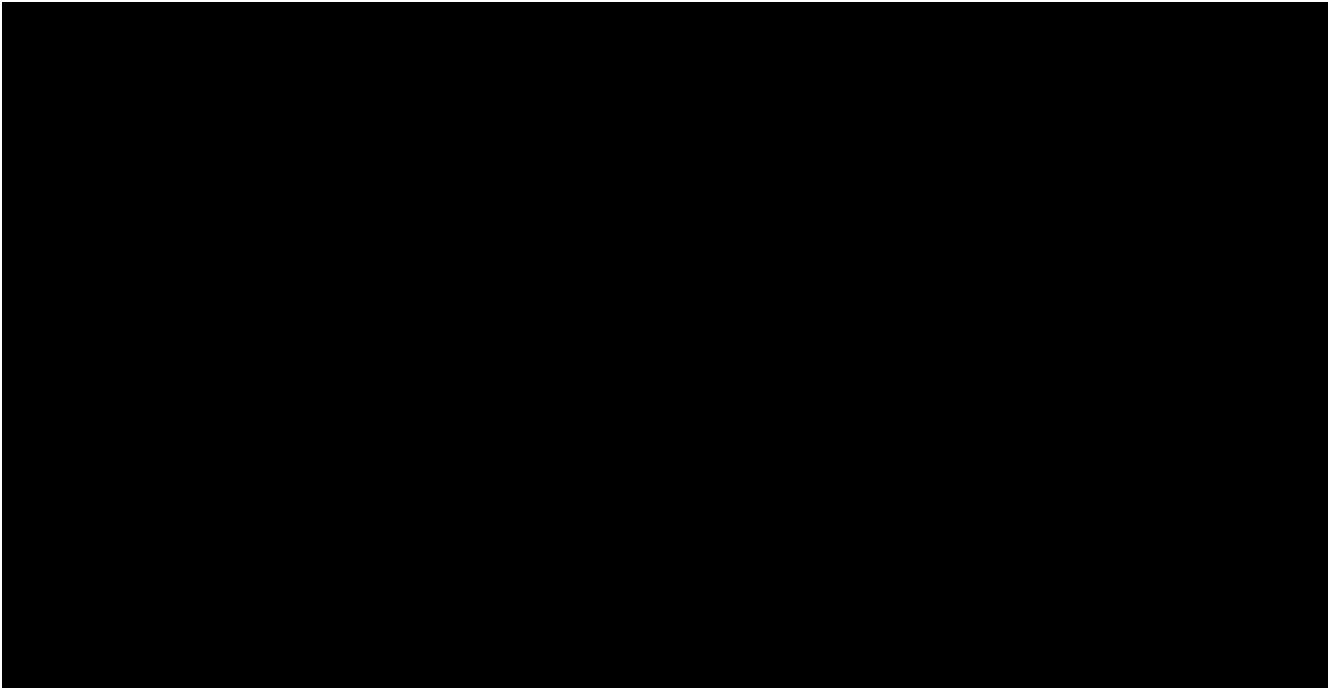
[REDACTED]



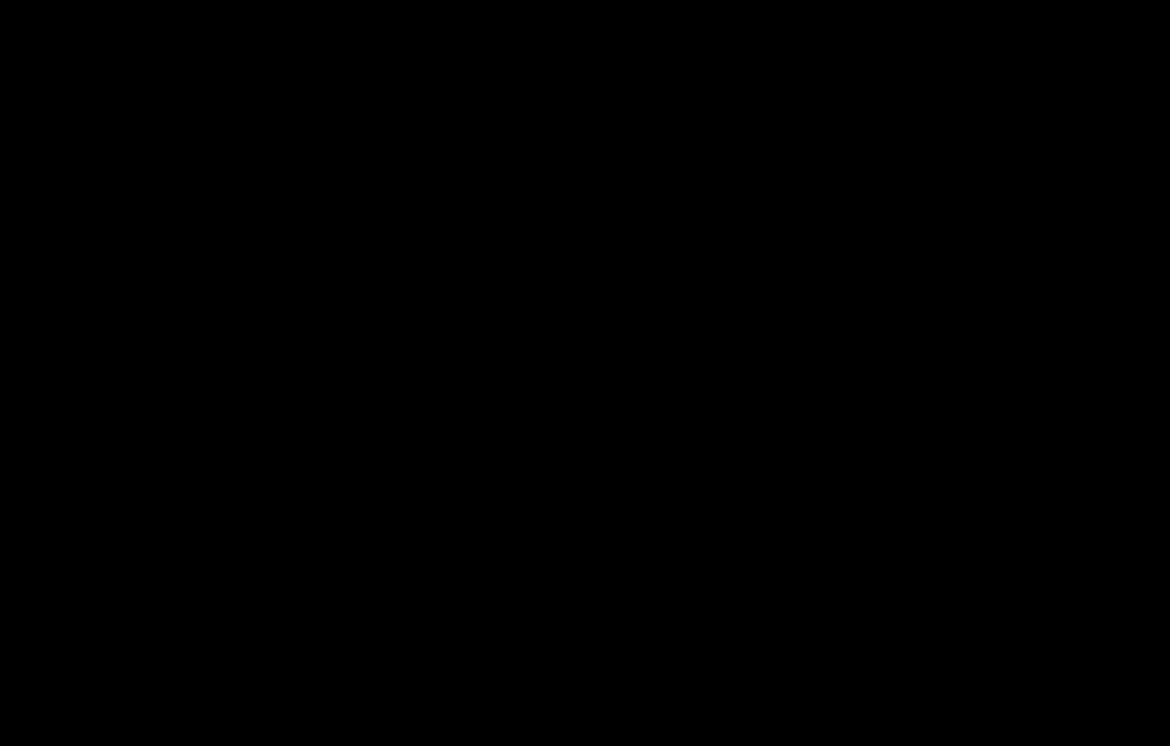
Opening Expert Report of M. Lopez, ¶ 202 (Table 4. Proportional Nokia Rate Based on the HEVC Pools) (Altered to reflect current Respondents).



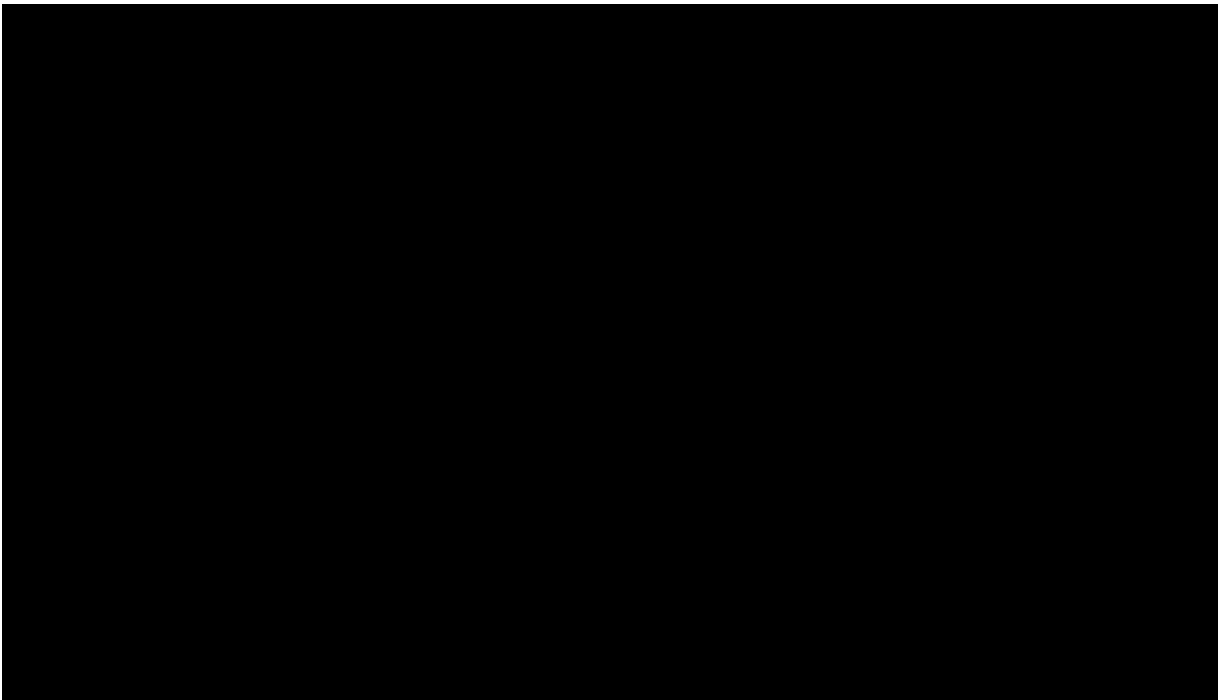
Opening Expert Report of M. Lopez ¶ 204 (Table 6. Proportional Nokia Rate Based on the AVC and HEVC Pools – US Patents) (Altered to reflect current Respondents).



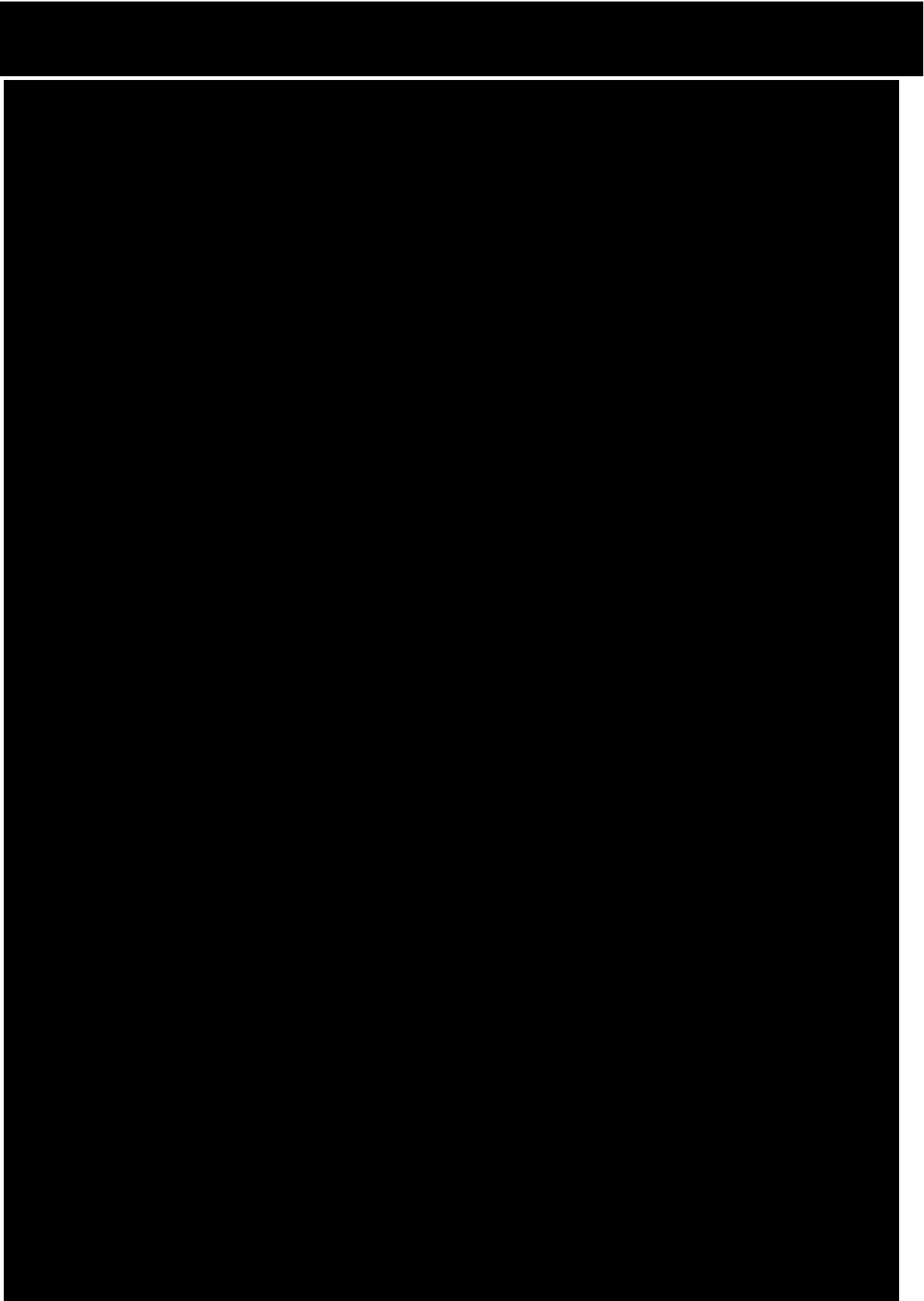
Opening Expert Report of M. Lopez ¶ 208 (Table 7. Nokia's Rates Should Decline Over the Term of Licenses Offered to Respondents) (Altered to reflect current Respondents).



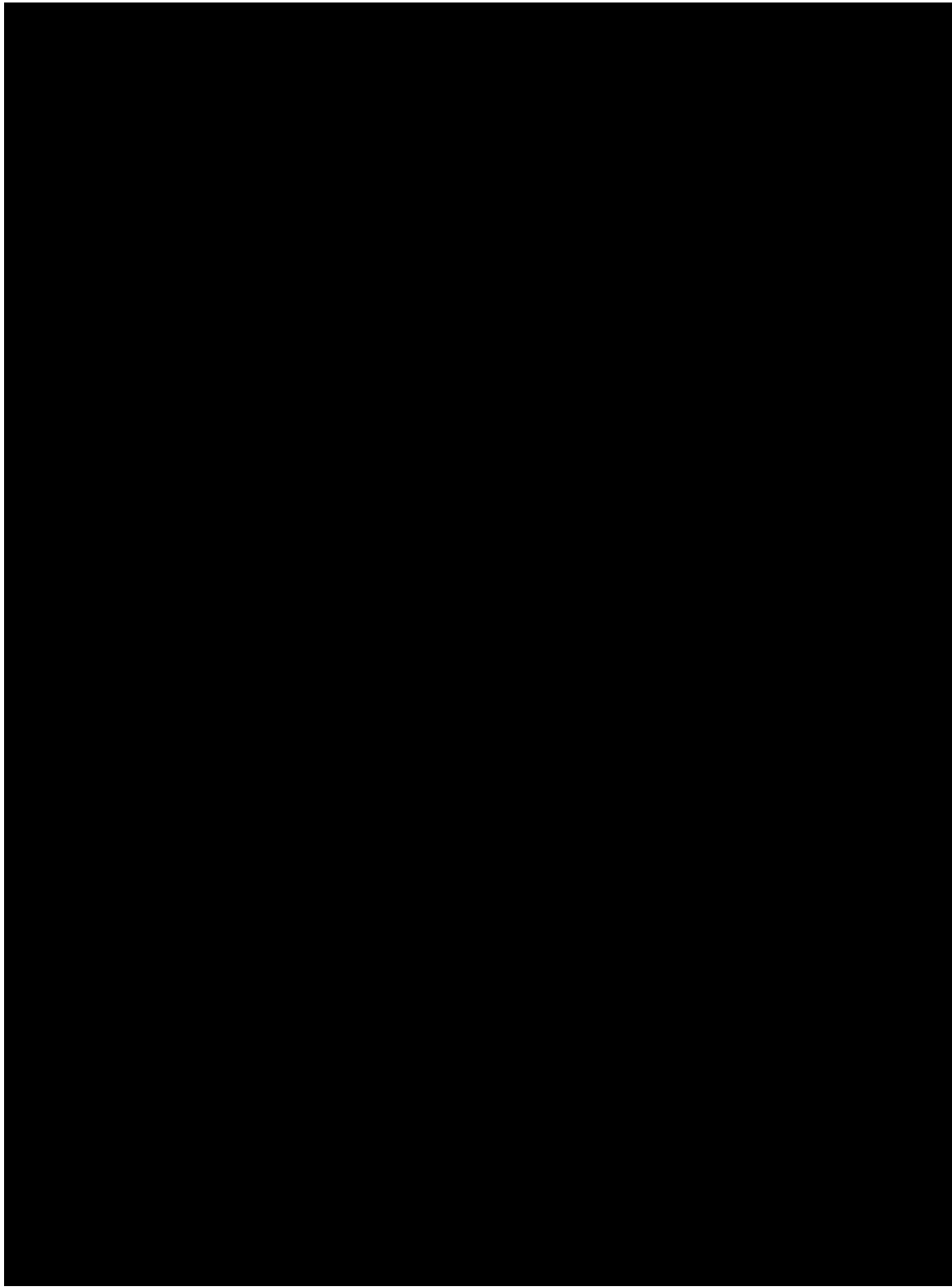
Rebuttal Report of S. Acton ¶ 103 (H.264 Portfolio Percentage Coverage by Section for US Patents) (Modified for space).



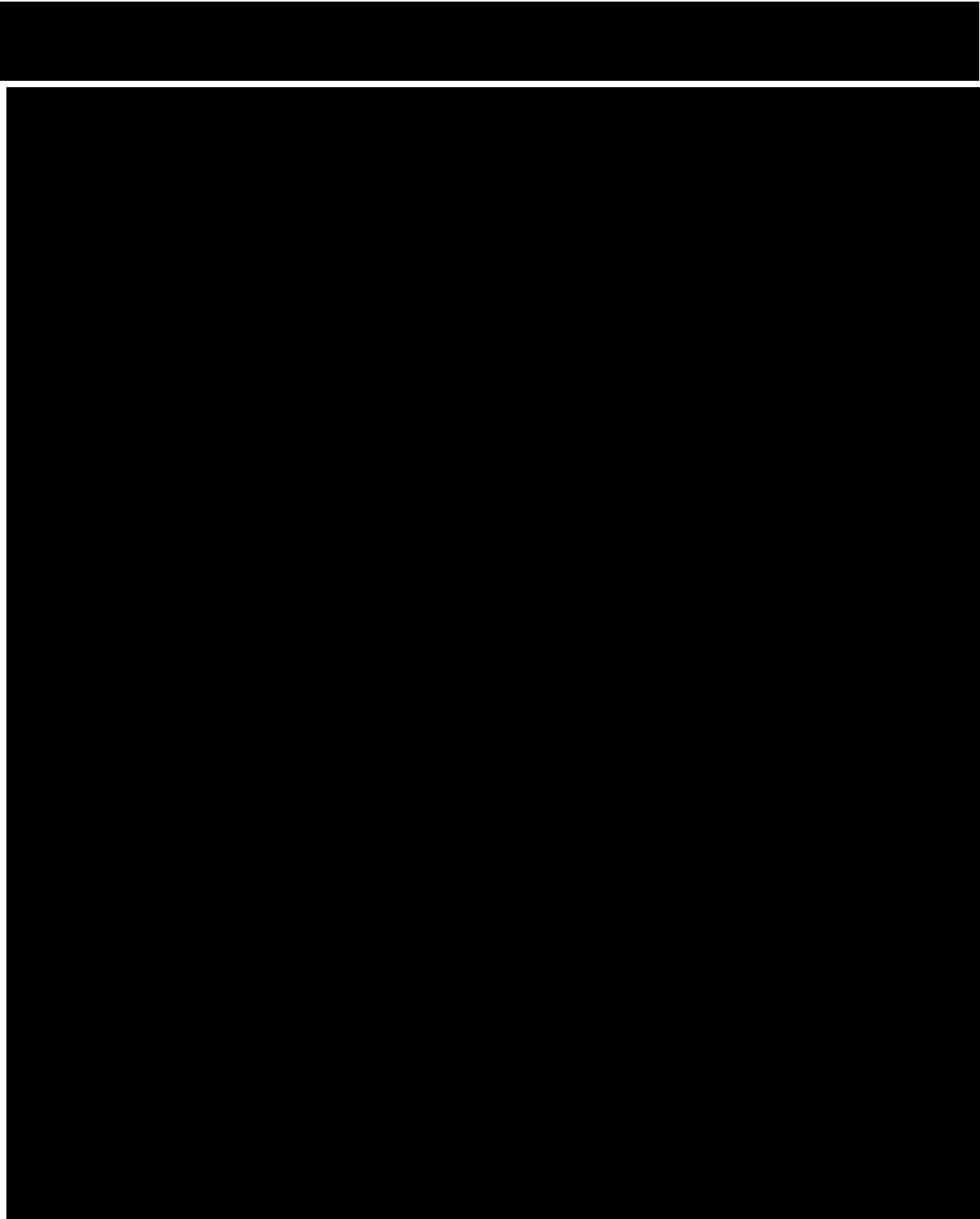
Rebuttal Report of S. Acton ¶ 121 (H.265 Portfolio Percentage Coverage by Section for US Patents) (Modified for space).

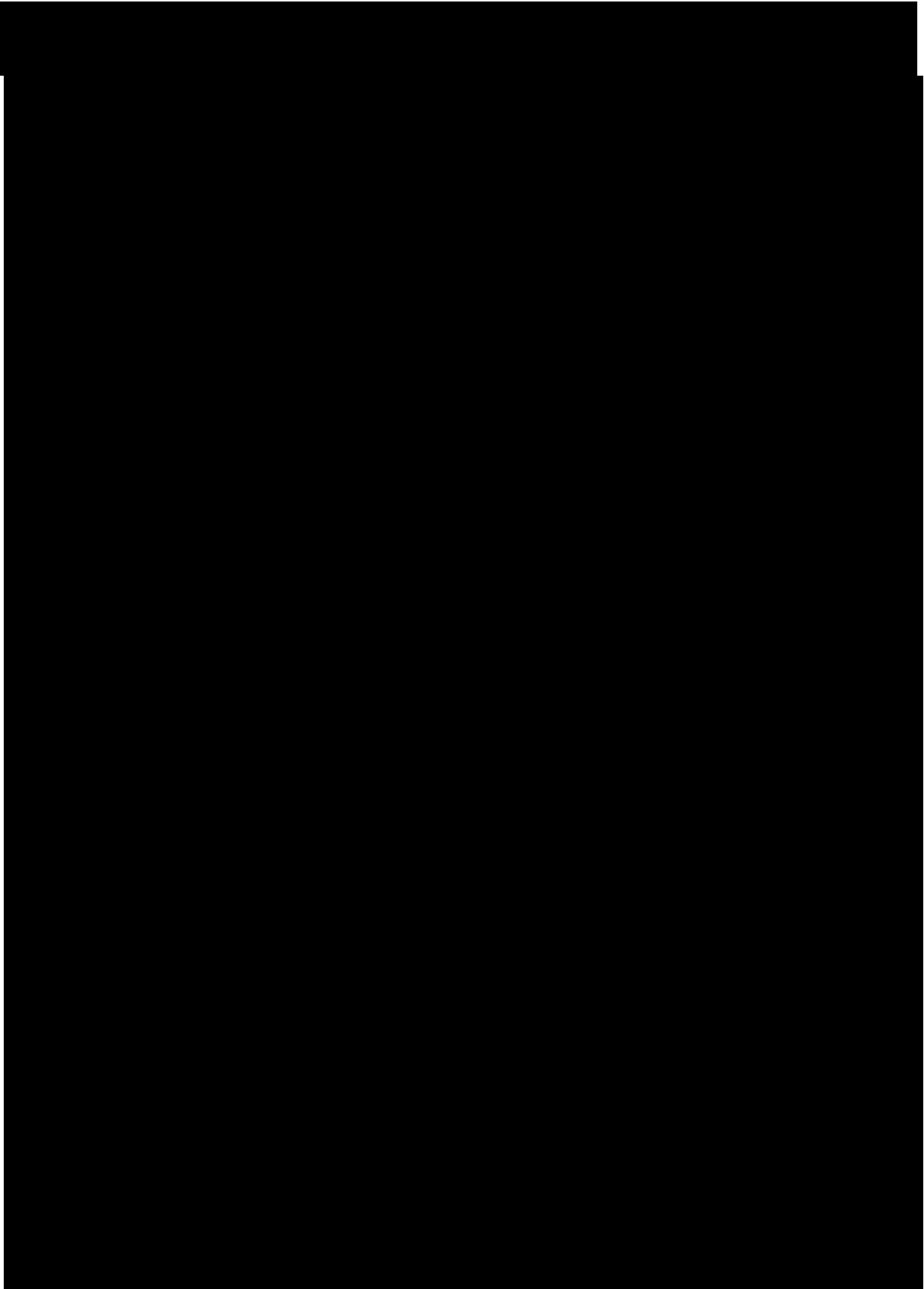


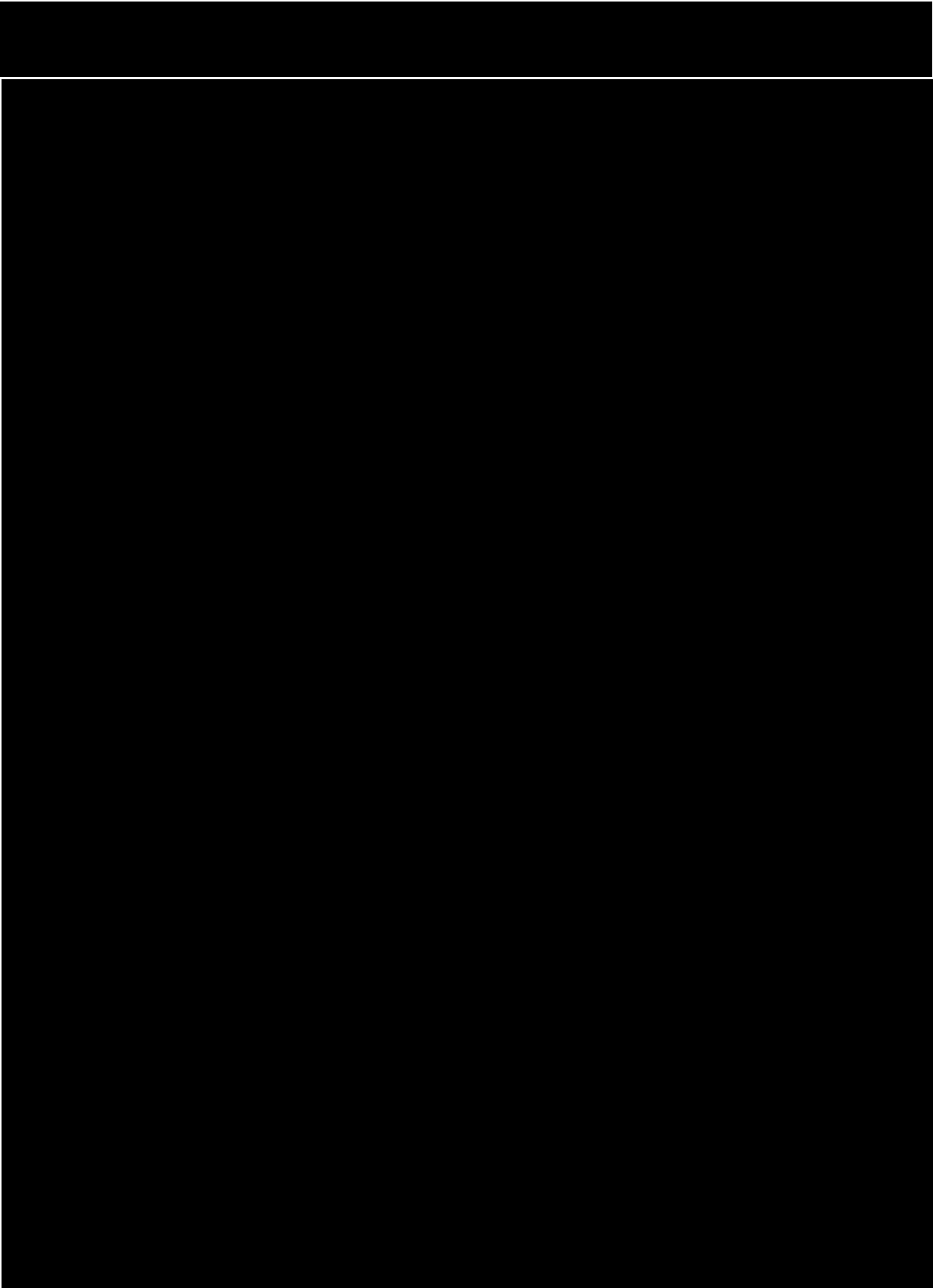




Rebuttal Report of S. Acton ¶ 101 (Patent Distribution by AVC Standard Section and Title for
Nokia and MPEG LA) (Modified for space).

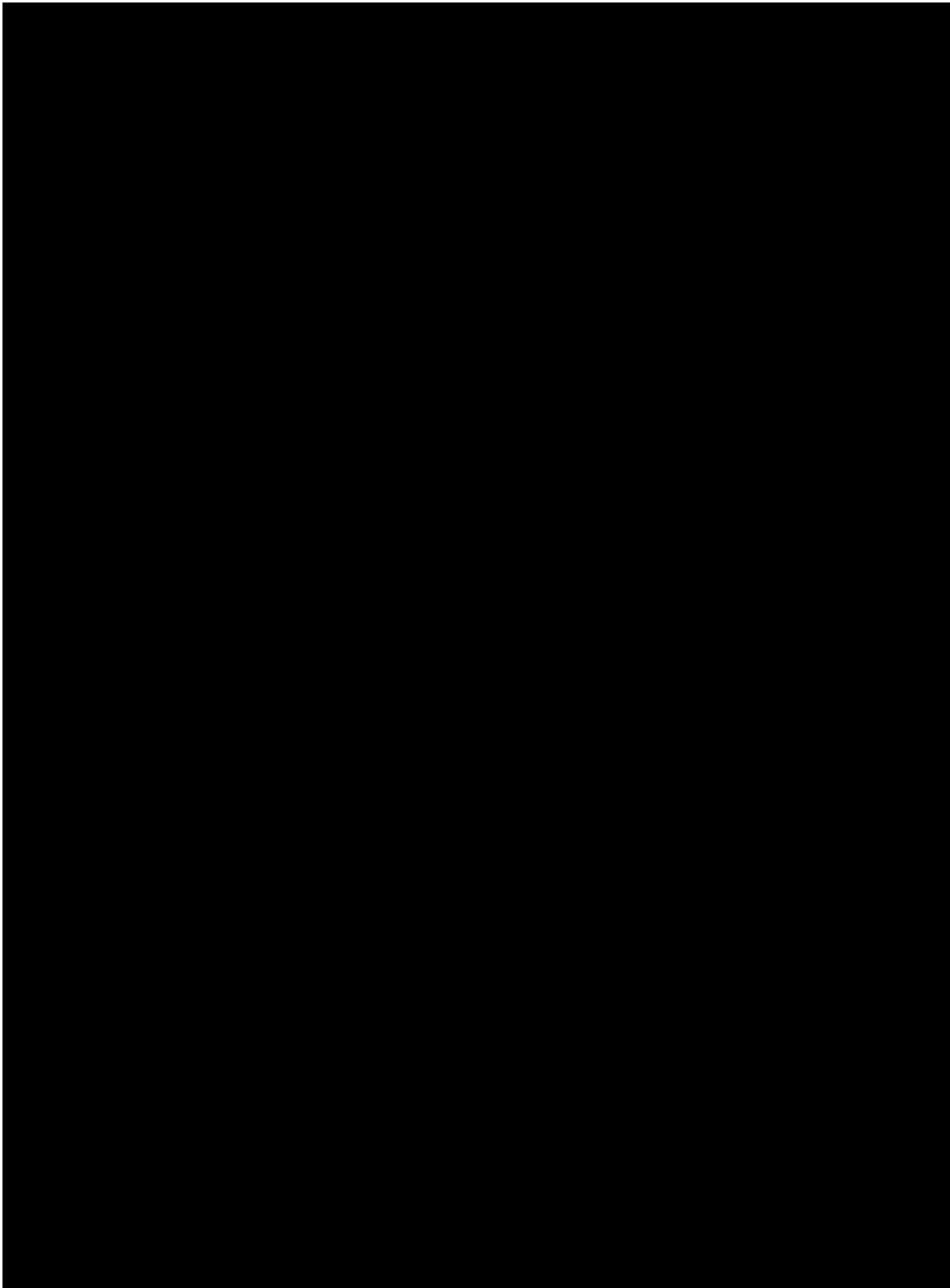




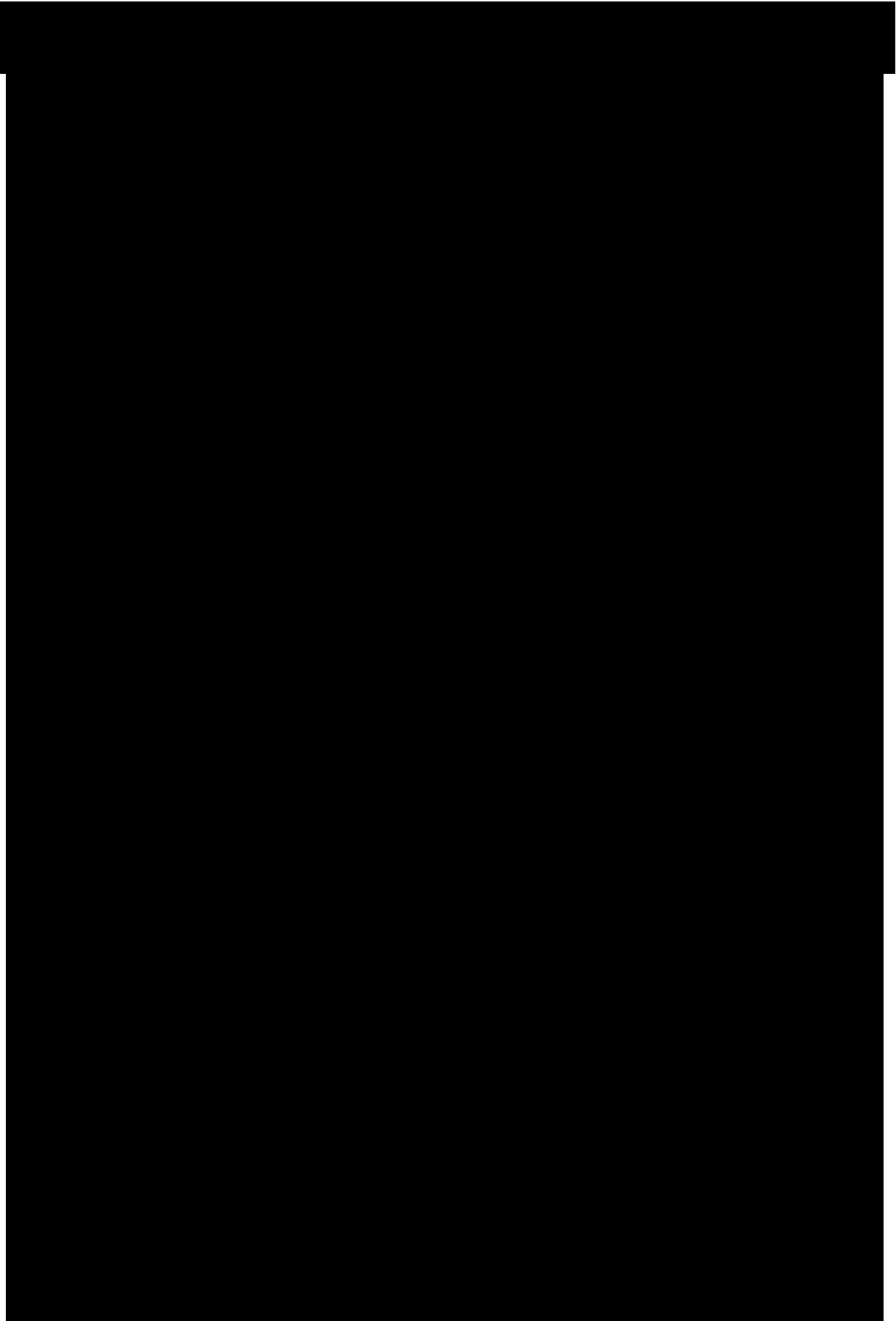


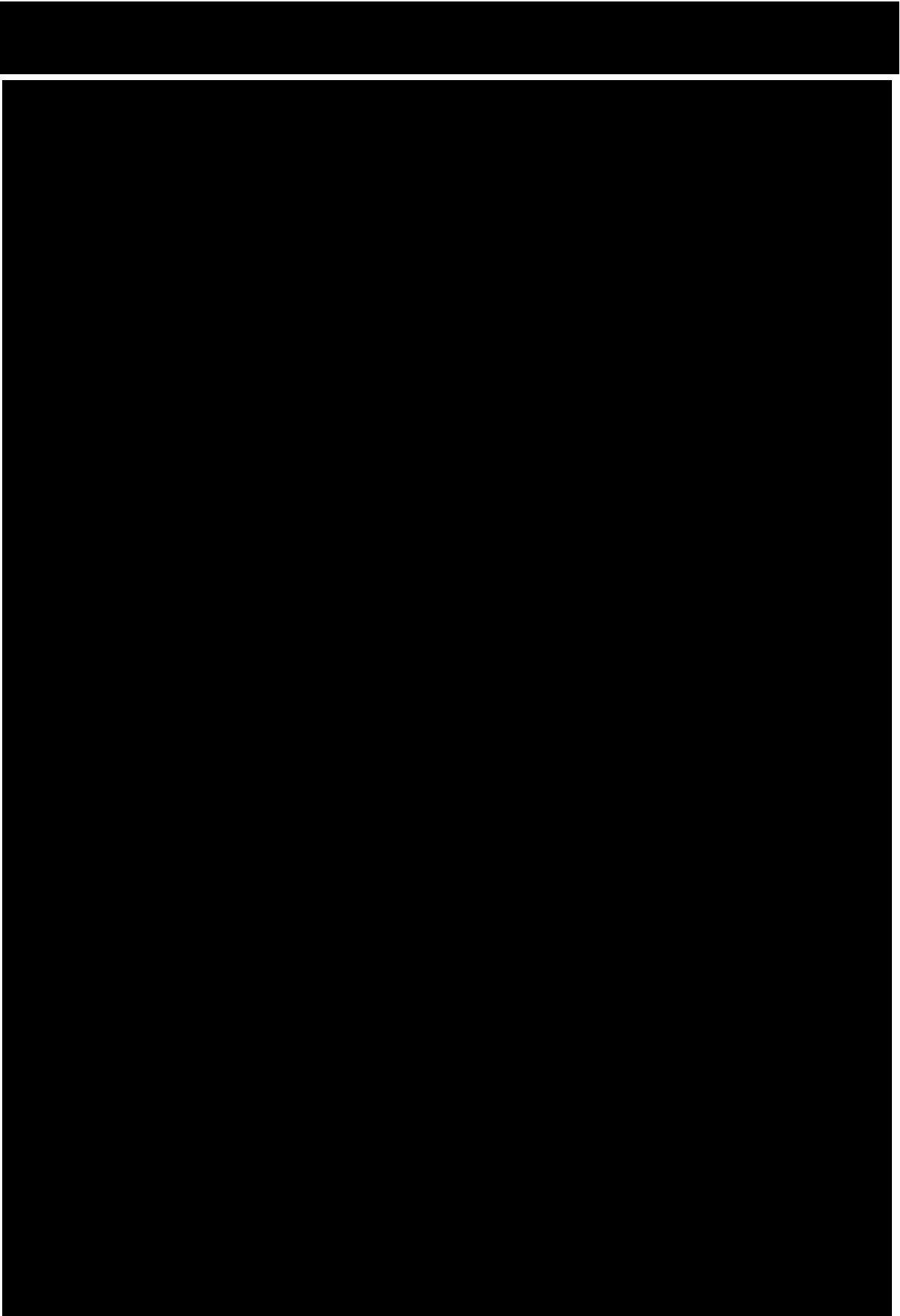
[REDACTED]

[REDACTED]



Rebuttal Report of S. Acton ¶ 119 (Patent Distribution by HEVC Standard Section and Title for Nokia, MPEG LA, and Access Advance) (Modified for space).

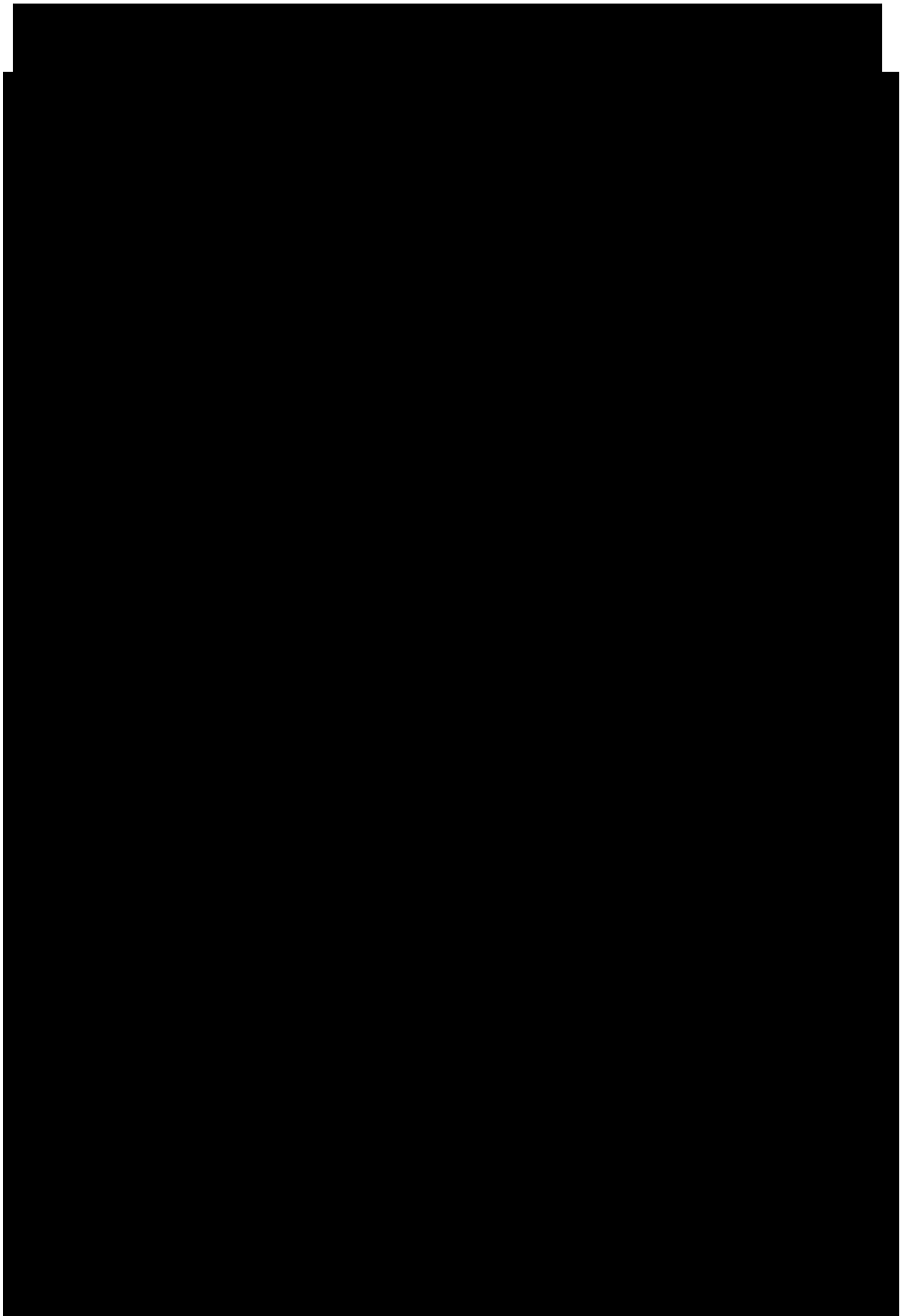




R-APPX at 48

[REDACTED]

[REDACTED]



R-APPX at 50