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I. INTRODUCTION

On December 4, 2014, the U.S. Court of Appeals for the Federal Circuit issued a decision in *Ericsson v. D-Link*, providing substantial guidance to lower courts on how to calculate royalty rates for standard-essential patents ("SEPs") encumbered by a commitment to license on reasonable and nondiscriminatory ("RAND") terms.[2] This article analyzes that decision, providing economic commentary on (i) its key holdings with respect to the appropriate methodology, (ii) the incremental value approach, (iii) when to consider concerns about hold-up and royalty stacking, and (iv) the use of the "smallest salable patent practicing unit" ("SSPPU").

II. BACKGROUND AND HOLDING

Ericsson sued D-Link and others alleging infringement of patents it claimed essential to the 802.11 (Wi-Fi) standard. A jury found that D-Link and the other defendants infringed the asserted claims of three patents and assigned roughly $10M in damages—approximately 15 cents per infringing device. After post-trial motions, the district court upheld the jury's infringement and validity finding and refused to grant a new trial based on an alleged violation of the "entire market value rule" ("EMVR") and allegedly deficient jury instructions regarding the standard-setting context and Ericsson's RAND licensing obligations.

The Federal Circuit vacated the jury's damages award, finding that

> the district court committed legal error in its jury instruction by: (1) failing to instruct the jury adequately regarding Ericsson's actual RAND commitment; (2) failing to instruct the jury that any royalty for the patented technology must be apportioned from the value of the standard as a whole; and (3) failing to instruct the jury that the RAND royalty rate must be based on the value of the invention, not any value added by the standardization of that invention—while instructing the jury to consider irrelevant *Georgia-Pacific* factors.[3]

III. APPROPRIATE METHODOLOGY

Thus far, the overwhelming majority of district courts that have addressed the issue of how to calculate RAND royalties have applied a modified version of the 15 factors set forth in

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[2] 773 F.3d 1201 (Fed. Cir. 2014).

[3] *Id.* at 1235.

Georgia-Pacific.[4] The Federal Circuit held that "[t]here is no *Georgia-Pacific*-like list of factors that district courts can parrot for every case involving RAND-encumbered patents."[5] Instead, courts must instruct the jury only on factors that are relevant to the record developed at trial, and must instruct the jury on the actual RAND commitment at issue.

In making this determination, the Federal Circuit decision reflects how *Georgia-Pacific* factors are typically used in traditional patent infringement cases: not every factor will apply to every case and which factors should be emphasized often varies as well. That being said, though the Federal Circuit refused to provide a recommended modification of all 15 of the *Georgia Pacific* Factors for universal use in RAND cases, it did provide some further guidance on this issue.

For example, the court noted that "[i]n a case involving RAND-encumbered patents, many of the *Georgia–Pacific* factors simply are not relevant; many are even contrary to RAND principles."[6] Namely, the licensor's established policy to maintain its patent monopoly (*Georgia Pacific* Factor 4) and the relationship between the SEP holder and the putative licensee (*Georgia Pacific* Factor 5) will never be relevant for an SEP holder who has committed to RAND licensing. While an SEP holder can legitimately charge differently situated licensees different rates reflecting the differential value those licensees receive from the patented technologies, the "ND" portion of RAND prevents SEP holders from discriminating on the basis of whether or not it competes directly with the licensee.

The Federal Circuit also added additional clarity by calling for lower courts to reference to the actual RAND commitment at issue. While the debate often refers to "the RAND commitment" as if it were a monolithic promise, there are in fact subtle, but important, differences across standard setting organizations ("SSOs") in regards to their Intellectual Property Rights ("IPRs") policies.

For example, some organizations require their members to sign contracts (membership agreements), while others simply require IPR declarations (such as letters of assurance).[7] The definition of what is and is not considered "essential" varies too, as do the details included in the RAND pledge requested, such as the requested geographic scope for the license, reciprocity in licensing, and the license duration.[8] Accounting for differences in terms like these could well affect the hypothetical negotiation framework that should be employed.

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[4] *See* Anne Layne-Farrar & Koren Wong-Ervin, *Methodologies For Calculating FRAND Damages*, Parts 1-3, LAW360 (Oct. 8-10, 2014), *available at* http://www.ftc.gov/system/files/attachments/key-speeches-presentations/wong-ervin_-_methodologies_for_calculating_frand_damages.pdf (analyzing the district court cases that have determined a RAND royalty rate) [hereinafter Layne-Farrar & Wong-Ervin].

[5] *Ericsson*, 773 F.3d at 1235.

[6] *Id.* at 1230-31.

[7] For a comparison of RAND commitments across SSOs, see Rudi Bekkers & Andy Updegrove, *A study of IPR policies and practices of a representative group of Standards Setting Organizations worldwide* (2012), a National Academies of Science Working Paper *available at* http://home.tm.tue.nl/rbekkers/nas/Bekkers_Updegrove_NAS2012_main_report.pdf.

[8] *Id.*

IV. INCREMENTAL VALUE APPROACH AND APPORTIONMENT

The Federal Circuit held that "any royalty award must be based on the incremental value of the invention, not the value of the standard as a whole or any increased value the patented feature gains from its inclusion in the standard."[9] According to the Federal Circuit, to ensure that the royalty award is based on the incremental value that the patented invention adds to the product, "the patented feature must be apportioned from all of the unpatented features reflected in the standard," and "the patentee's royalty must be premised on the value of the patented feature, not any value added by the standard's adoption of the patented technology."[10] The Federal Trade Commission ("FTC") has also advocated that "courts should cap the royalty at the incremental value of the patented technology over alternatives available at the time the standard was chosen."[11] While the Federal Circuit did not reject this approach, it also did not appear to address it, but rather used the term "incremental value" to refer to apportionment.[12]

The court held that a RAND assessment must be focused on the value to the standard and products embodying the standard that the SEP portfolio at issue has contributed—a position that that is consistent with the FTC's recommendation from its 2011 IP Report.[13] This finding is appropriate because proper apportionment will isolate the value of the patented technology from any value associated with hold-up or royalty stacking.

Recall that "patent hold-up" refers to the potential problem that arises when an SEP holder has made a commitment to license on RAND terms but then seeks to use standard-lock-in to obtain an unjustifiably higher royalty than would have been possible *ex ante*, before the patents were included in the standard. The royalty stacking theory, which is based on the Cournot complements problem, maintains that patent holders will set their royalty rates without regard to the other strictly complementary patent holders, such that a cumulative royalty "stack" can emerge for the good's producer that is so high that it cripples the product market or, at a minimum, severely restricts output.

It is important to distinguish between an aggregate royalty burden that accurately reflects the cumulative value of the various SEPs included in a given standard from an aggregate royalty burden that includes at least some supra-RAND rates (individual hold-ups). The former is simply the cost of making products that benefit from valuable intellectual property, analogous to any other cost of doing business. For example, automakers face an aggregate input cost covering all of the many components needed to produce a car. There is nothing inherently anticompetitive in needing multiple inputs to produce a particular good, nor in each of those input suppliers

[9] *Ericsson*, 773 F.3d at 1235.

[10] *Id.* at 1232.

[11] FTC, *The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Competition* (March 2011) at 189, *available at* http://www.ftc.gov/sites/default/files/documents/reports/evolving-ip-marketplace-aligning-patent-notice-and-remedies-competition-report-federal-trade/110307patentreport.pdf [hereinafter 2011 IP Report].

[12] *See, e.g., Ericsson*, 773 F.3d at 1226 ("The essential requirement is that the ultimate reasonable royalty award must be based on the incremental value that the patented invention adds to the end product."); *id.* at 1228 ("The court should also ensure that the instructions fully explain the need to apportion the ultimate royalty award to the incremental value of the patented feature from the overall product.").

[13] *See* 2011 IP Report at 189-91.

charging a fair price for their contribution. To the best of our knowledge, no one has accused steel makers of creating a "stack" for auto production.

One of the assumptions underlying the Cournot complements problem is that each input suppler will price their inputs without regard to the price charged for other needed inputs, but there is no reason to assume that will necessarily be the case in standard-setting contexts. First, SEPs may have limited or no applications outside of the standard, in contrast to the zinc and copper inputs Cournot had in mind for brass production. With only one market in which to license their patents, SEP holders may have insufficient leverage to push supra-RAND rates.[14] Moreover, the SEP holders will be cooperating with one another—and all other SSO members—in the development of the standard, and are thus likely to know what patents are expected to be asserted and by whom. As a result, there is no reason to presume that SEP holders will set rates without regard to the full complement of known SEPs.

As long as the inputs for multi-component products are priced according to the value of the patented contribution to the end product, no SEP holder can be faulted for either hold up or stacking. Proper apportionment is a reasonable means to accomplish this goal. When rates are properly focused on the value that the specific patents contribute to products compliant with a standard—and not on other product features, the value of the overall standard, or implementer switching costs—then the risk of either patent hold-up or royalty stacking is eliminated.

V. HOLD-UP AND ROYALTY STACKING

Prior to the Federal Circuit's decision, lower courts were divided on whether concerns about hold-up and royalty stacking must be taken into consideration, or whether they must be proven with evidence as opposed to simply discussed in theoretical terms.[15] One popular approach had been to estimate the aggregate royalty burden assuming that all SEP holders would charge the same rate as that offered by the accused SEP holder.[16]

In *Ericsson*, the Federal Circuit held that to be considered as part of a RAND damages analysis, concerns about hold-up and royalty stacking must be proven, stating that "[c]ertainly something more than a general argument that these phenomena are possibilities is necessary."[17] Instead, the court instructed that implementers must provide evidence that the SEP holder "used its SEPs to demand higher royalties from standard-compliant companies."[18]

With respect to royalty stacking, the Federal Circuit's decision rejects the approach taken by some of the district courts of addressing the risk of royalty stacking by considering the aggregate royalties that would apply if other SEP holders made similar royalty demands of the implementer, without requiring the implementers to show what royalties they were currently

[14] This point relates to reverse hold-up, when licensees use their leverage to obtain below-RAND rates and terms, and to holdout, when licensees either refuse to take a RAND license or delay in doing so.

[15] *Compare Microsoft v. Motorola,* 2013 WL 2111217 at *12 (W.D. Wash. Apr. 25, 2013); *In re Innovatio IP Ventures, LLC Patent Litig.*, 2013 WL 5593609 at *8-10 (N.D. Ill. Oct. 3, 2013) *with Ericsson v. D-Link*, 2013 WL 4046225 at *18 (E.D. Tex. Aug. 6, 2013).

[16] *See, e.g., Microsoft v. Motorola*, 2013 WL 2111217 at *73; *In re Innovatio IP Ventures, LLC Patent Litig.*, 2013 WL 5593609 at *9-10 (using the equal-patent approach as a check on other calculations).

[17] *Ericsson*, 773 F.3d at 1234.

[18] *Id.*

paying. Under the Federal Circuit's decision, the actual cumulative royalty paid by a particular implementer must be proven and assessed to determine whether it is excessive.

This is an important holding that recognizes the economic theory behind hold-up and royalty stacking, as discussed above. Hold-up requires lock-in, i.e., standard-implementing companies with asset-specific investments can be locked in to the technologies defining the standard.[19] On the other hand, innovators that are contributing to the standard-setting body can also be locked-in if their technologies have a market only within the standard. Thus, a hold-up risk is present on both sides of the licensing table. For holdup in any guise to occur, however, there must be an action by the relevant party once lock-in has occurred. The mere fact that a license agreement was signed after the patent(s) were included in a standard is not enough to establish that the patent holder is practicing hold-up.

Several market-based factors mitigate the risk of hold-up. For example, reputational and business costs may deter repeat players from engaging in hold-up and "patent holders that have broad cross-licensing agreements with the SEP-owner may be protected from hold-up."[20] In addition, patent holders often enjoy a first-mover advantage if their technology is adopted as the standard. "As a result, patent holders who manufacture products using the standardized technology 'may find it more profitable to offer attractive licensing terms in order to promote the adoption of the product using the standard, increasing demand for its product rather than extracting high royalties.'"[21] Moreover, not all patents are of equal value, and reasonable royalties should reflect the value of the SEP at issue. Thus, it does not make sense to estimate the aggregate royalty for a standard by assuming that all SEP holders would charge the same (or similar) rates.[22]

Royalty stacking need not occur with respect to a given standard. In addition to the points discussed above in regard to the Federal Circuit's ruling on apportionment, we also need to keep in mind the difference between the number of SEPs and the number of SEP holders. Given the prevalence of portfolio licensing, it is the latter number that we care about. Even if a license to 1,000 SEPs were required to implement a given standard, if all of those SEPs were held by a single entity who licensed on a portfolio basis, there would be no stack at all. Indeed, this is the driving force behind the creation of patent pools.

It is important as well to note that not all SEP holders seek any license payments: "The mere fact that thousands of patents are declared to be essential to a standard does not mean that

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[19] For a discussion of the theoretical roots of the hold-up theory, see F. Scott Kieff & Anne Layne-Farrar, *Incentive Effects From Different Approaches to Holdup Mitigation Surrounding Patent Remedies and Standard-Setting Organizations*, 0(0) J. COMPETITION L. & ECON. 1-33 (2013).

[20] Prepared Statement of The Federal Trade Commission Before the U.S. Senate Committee on the Judiciary Concerning "Standard Essential Patent Disputes and Antitrust Law" at 6 (July 30, 2013), *available at* http://www.ftc.gov/sites/default/files/documents/public_statements/prepared-statement-federal-trade-commission-concerning-standard-essential-patent-disputes-and/130730standardessentialpatents.pdf.

[21] *Id.* (quoting Fed. Trade Comm'n & U.S. Dep't of Justice, *Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition* at 40-41 (2007), *available at* http://www.ftc.gov/sites/default/files/documents/reports/antitrust-enforcement-and-intellectual-property-rights-promoting-innovation-and-competition-report.s.department-justice-and-federal-trade-commission/p040101promotinginnovationandcompetitionrpt0704.pdf)).

[22] *See* Layne-Farrar & Wong-Ervin, *supra* note 4, Part 1 at 4 for a mathematical explanation.

a standard-compliant company will necessarily have to pay a royalty to each SEP holder."[23] Thus, the existence of royalty stacking should not be presumed, but rather should be evaluated on a case-by-case basis by considering evidence of other licenses taken by a potential licensee on patents essential to the relevant standard. Lastly, as explained above, a RAND assessment focused on the value to the standard and products embodying the standard that the SEP portfolio at issue has contributed will necessarily avoid hold-up and royalty stacking.

VI. SSPPU

The Federal Circuit in *Ericsson* reiterated its prior statements from *LaserDynamics* that the SSPPU ("smallest salable patent-practicing unit") was created as an evidentiary rule "to help our jury system reliably implement the substantive statutory requirement of apportionment of royalty damages to the invention's value."[24] The court went on to explain that:

> [l]ogically, an economist could do this [apportionment] in various ways—by careful selection of the royalty base to reflect the value added by the patented feature, where that differentiation is possible; by adjustment of the royalty rate so as to discount the value of a product's non-patented features; or by a combination thereof. The essential requirement is that the ultimate reasonable royalty award must be based on the incremental value that the patented invention adds to the end product.[25]

The Federal Circuit held that the jury could hear evidence about comparable licenses based on the end product rather than the SSPPU, reasoning that "[m]aking real world, relevant licenses inadmissible … would often make it impossible for a patentee to resort to license-based evidence."[26]

The FTC has recommended that "[c]ourts should identify as the appropriate base that which the parties would have chosen in the hypothetical negotiation as best suited for accurately valuing the invention."[27] Although the FTC went on to state that "[t]he practical difficulty of identifying a royalty rate that accurately reflects the invention's contribution to a much larger, complex product often counsels toward choosing the smallest priceable component that incorporates the inventive feature," the FTC clearly recommended that the focus should be on the basis for determining royalties that the parties would have used.

Importantly, for some technology, using the smallest component or device as the royalty base may under- or over-value the technology. For example, some technology may technically be implemented by a single component part, yet its value may exceed the component itself such that using an appropriately apportioned end-user product price as the royalty base may provide a more accurate means to value the technology at issue.

Moreover, the value of a given SEP portfolio as realized by a licensee also may vary depending on the final product in which the licensee incorporates the technology. For example, a

[23] *Ericsson*, 773 F.3d at 1234.
[24] *Id.* at 1226.
[25] *Id.*
[26] *Id.* at 1228.
[27] 2011 IP Report at 212.

given SEP portfolio may deliver very different value to a mobile infrastructure manufacturer as compared to a handset maker as compared to a network operator.

With respect to using comparable licenses that rely on the end-user device as the royalty base, the context of those licenses is often important. There are a number of considerations that may dictate private parties' selection of a royalty base in a freely negotiated license agreement. Industry practice and the convenience of the parties is one such consideration; other commercial dealings between the parties is another. In order to reduce administrative costs, a royalty base is often selected to allow for easy monitoring or verification of units sold; end product prices are often chosen for these reasons. Indeed, as a practical matter, we have found that most licenses in many high-tech markets, including smartphones, are negotiated on a patent portfolio basis using the end-user device as the royalty base.

VII. GOING FORWARD

Given that the Federal Circuit, which has nationwide appellate jurisdiction over patent disputes, is often the last word on patent issues, the court's *Ericsson* decision provides important guidance to lower courts on how to determine RAND royalty rates. While the decision is binding on lower courts calculating RAND rates in patent infringement cases, whether lower courts will follow the decision in determining RAND rates in contract disputes (such as Judge Robart's decision in *Microsoft v. Motorola*) remains to be seen.