A SINGLE SPARK CAN START A PRAIRIE FIRE: IMPLICATIONS OF THE 2015 AMENDMENTS TO IEEE-SA'S PATENT POLICY

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I. INTRODUCTION

Interoperability is a vital prerequisite for numerous products, embedded with advanced technologies, to work seamlessly across users. Inoperability guaranteed the inevitability of Moore's Law—the principle that has powered the Information Technology revolution over the past four decades in making our world more digitally connected than ever before.[1] There is a high demand for multiple inventions within one technology to work together, and a need to have numerous technologies communicate with each another. Standard-setting organizations (SSO), such as the Institute of Electrical and Electronic Engineers Standards Association (IEEE-SA) aid in facilitating the interoperability of systems.[2] Published SSO standards outline technical requirements that guarantee

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[1] G. Moore, a founder of Fairchild Semiconductor (and later Intel), predicted a doubling of components per microchip each year. This prediction held true and became known as Moore's Law. Chris A. Mack, *Fifty Years of Moore's Law*, 24 IEEE TRANSACTIONS ON SEMICONDUCTOR MANUFACTURING 202, 202 (2011).

[2] The quantity of standards set forth just by the IEEE are extensive. *See, e.g.*, IEEE 2030-2011 (AM. NAT'L STANDARDS INST. 2013); ANSI/IEEE 1420.1-1995 (AM. NAT'L STANDARDS INST. 2002); IEEE 1849-2016 (AM. NAT'L STANDARDS INST. 2018).

interoperability across and within devices that utilize the standardized technologies.[3]

With technology constantly evolving, the standards created across an array of bodies in various sectors have undergone vast changes. The aspirations of standards bodies are such that an implementer is able to utilize the standard under expectable licensing terms even though it consists of contributions covered by various patents. These worldwide interoperable innovations require predictable rules to manage Fair, Reasonable, and Nondiscriminatory (FRAND) licensing practices for standard essential patents (SEPs) that cut across global fringes. SSOs, such as the Institute of Electrical and Electronic Engineers (IEEE), the European Telecommunications Standards Institute (ETSI), and the International Telecommunications Union (ITU), facilitate this by helping develop and manage technical standards, which are essentially technical requirements for products embedded with patented inventions.[4] The overarching objective of standard bodies is to ensure availability of standardized technologies to any implementer under licensing terms that vary across standards and standard bodies. For instance, according to ETSI, standards provide safety and reliability of products and services; support government policies and legislation for protecting user and business interests; ensure interoperability among products and services that comply with standards; bring business benefits, such as opening up market access, providing economies of scale, encouraging innovation, and increasing awareness of technical developments and initiatives, and providing consumers choice among a variety of accessible products based on standards.[5]

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[3] Patrick D. Curran, *Standard-setting Organizations: Patents, Price Fixing, and Per Se Legality*, 70 U. CHI. L. REV. 983, 985 (2003) ("Technical standards, and the SSOs that develop them, are a common and essential element of the modem economy. As early as 1987, more than four hundred standard-setting groups had developed approximately thirty thousand voluntary standards. Because standard setting requires particular expertise in specialized product areas, new SSOs are constantly forming to meet the needs of niche markets.").

[4] *See generally id.*; *About ETSI*, ETSI, http://www.etsi.org/about [https://perma.cc/46CZ-45BR]; *About International Telecommunication Union (ITU)*, ITU, https://www.itu.int/en/about/Pages/default.aspx [https://perma.cc/2MDS-FA3C].

[5] *Why We Need Standards*, ETSI, http://www.etsi.org/standards/why-we-need-standards [https://perma.cc/6YKR-8EZS].

This Article attempts to explain the details of changes to the patent policy of IEEE-SA implemented in early 2015 and to analyze the impact of these changes on incentives for innovation and diffusion of innovation in essential technologies that are enabled by a well-functioning SSO. Broadly, the policy changes redefined the prevailing meaning and terms of how SEP licensing will be carried out. This includes the obligation set by IEEE that an SEP holder has to accept in the form of a Letter of Assurance (LOA), a promise to license its essential patents on FRAND terms to any implementer of a standard administered by IEEE.[6] In Part II, we briefly discuss the importance of standard-setting, followed by Part III, wherein we explain the Wi-Fi standard and the developments that led to the IEEE-SA's policy change, while placing emphasis on issues of royalty rates, injunctive relief, and reciprocal licensing. Next, we discuss some of the implications of the latest policy change.

II. IMPORTANCE OF STANDARD-SETTING

Most information technology and internet-enabled products and services exhibit network effects, and in such industries, standardization and compatibility are vital. Within the intricacies of a given industry, the successful dispersion of these products is often provisional on the emergence of a single standard.[7] The pathologies in standard-setting are based on the basic idea of network externalities.[8] With the number of communication devices, including smartphones, increasing exponentially in most parts of the world,[9] the value to each user of a device has increased. A majority of interoperability standards over the past two decades have been developed by consensus-driven associations, which

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[6] The patent holder can alternatively circumvent by declining to submit an LOA or submitting a negative LOA expressing their noncommitment to license SEPs. *See* Art MacCord, *Standard Essential Patents: The IEEE Approach*, IEEE POWER ELECTRONICS MAG., Sept. 2015, at 10, 10.

[7] Nicholas Economides & Lawrence J. White, *One-Way Networks, Two-Way Networks, Compatibility, and Public Policy*, *in* OPENING NETWORKS TO COMPETITION: THE REG. AND PRICING OF ACCESS 9, 14 (David Gabel & David F. Weiman eds., 1998).

[8] *Id.* at 14–15.

[9] Max Miceli, *Smartphones Are Taking Over the U.S.*, U.S. NEWS & WORLD REP. (Oct. 30, 2015, 6:00 AM), https://www.usnews.com/news/blogs/data-mine/2015/10/30/smartphones-are-taking-over-the-us (last visited Mar. 24, 2018).

collaborate within the SSO.[10] Voluntary participants include, but are not limited to, research laboratories, academic institutions, individuals, government agencies, private corporations, and public firms.[11] All participants can vary greatly in composition and in size. The SSOs formed in the United States are best considered "quasi-formal" groups that are typically large, international organizations that "share many of the characteristics of formally-recognized groups."[12] Their significance is to enable virtually all products on which people depend in modern society to interoperate with one another and to consequently encourage informed consumer choice, higher efficiency, and further innovation. This takes the shape of essential products like telecommunication devices, communication equipment, electrical mechanisms, and other mechanical systems to interoperate. SSOs' inclination to disclose and license SEPs is critical for the success of a standard's implementation in the future. SSOs position themselves as a fundamental part of the process to ensure that potential ex-post hold up situations are minimized, if not eliminated.[13] This comes through adequate disclosure of FRAND licensing commitments of SEPs made by patent owners.[14] On a fundamental level, standards are sets of technical descriptions and protocols of product features that enable interoperability.[15] They are rules that consist not only of government regulations, national laws, and SSO bylaws, but also industry conventions, business practices, social norms, traditions, and professional ethics.[16] Technology standards are the "subset of such rules,"

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[10] ICF, STANDARDS AND INTEROPERABILITY IN ELECTRIC DISTRIBUTION SYSTEMS 7–8 (2016).

[11] *Id.*

[12] Jorge L. Contreras, *Technical Standards, Standards-Setting Organizations and Intellectual Property: A Survey of the Literature (with an Emphasis on Empirical Approaches)*, *in* 2 RES. HANDBOOKS ON THE ECON. OF INTELL. PROP. LAW: ANALYTICAL METHODS 3–4 (Peter S. Menell & David Schwartz eds., 2017), https://ssrn.com/abstract=2900540 [https://perma.cc/UMV9-DUS6].

[13] Josh Lerner et al., *Patent Disclosures and Standard-Setting* 2 (Nat'l Bureau of Econ. Research, Working Paper No. w22768, 2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2851539 [https://perma.cc/3EFM-LZZE].

[14] *Id.*

[15] *Id.* at 5.

[16] Justus Baron & Daniel F. Spulber, *Technology Standards and Standards Organizations: Introduction to the Searle Centre Database* 3 (Nw. Law & Econ. Research Paper No. 17-16, 2015), http://www.law.northwestern.edu/research-faculty/searlecenter/

(*continued*)

which generally "govern characteristics" of the resulting transactions and contractual relationships."[17] While standards themselves are not patentable, standard-compliant products—products manufactured in accordance with provided standards—"generally satisfy the statutory requirements for patent protection."[18]

Standardization is set through two main mechanisms: the explicit coordination of product designs around generally-agreed technological measurements, and the *de facto* market dominance of a particular technology.[19] There are various purposes for standards in technology, "including reducing product variety, maintaining product quality and performance, measurement, codifying knowledge, assuring compatibility, articulating a vision of the industry, assuring health and safety, and controlling environmental quality."[20] SSOs particularly impact economic conditions such as risk, trust, manufacturing precision, transaction costs, network effects, barriers to entry, firm competencies, the division of labor, and the economies of scale.[21] SSOs follow patent policies, which require participants to disclose SEPs they hold during the standards development process.[22] Policies for licensing typically require that participants approve and grant licenses to implementers for their SEPs on FRAND terms.[23] These purported commitments assure that manufacturers are able to acquire licenses to sell standards-compliant products under SEPs.[24] Generally, SSOs are not required to micromanage the details of licensing bargains between SEP holders and manufacturers that desire access to

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innovationeconomics/documents/Baron_Spulber_Searle%20Center_Database.pdf [https://perma.cc/78S7-2TKK].

[17] *Id.*

[18] Contreras, *supra* note 12, at 8.

[19] Baron & Spulber, *supra* note 16, at 6–7.

[20] *Id.* at 1.

[21] *Id.*

[22] Joseph Farrell et al., *Standard Setting, Patents, and Hold-up*, 74 ANTITRUST L.J. 603, 624, 627 (2007).

[23] *Id.* at 609.

[24] Jorge L. Contreras, *National Disparities and Standards Essential Patents: Considerations for India*, *in* COMPLICATIONS AND QUANDARIES IN THE ICT SECTOR 1, 5 (Ashish Bharadwaj, Vishwas H. Devaiah, & Indranath Gupta eds., 2018) (ebook), https://link.springer.com/chapter/10.1007/978-981-10-6011-3_1#citeas [https://perma.cc/P2NL-EN65].

patents on the other side.[25] To be able to license all the patents that go into a standard is a remarkably complex process. The problem in the context of standard-setting is that of collective action, or collective adoption defects.[26] At least in theory, adoption of products with network externalities can be frustrated by collective action problems such as excess inertia, where an existing standard that ought to be displaced is not displaced due to user commitments and path dependency.[27] It can also be frustrated by excess momentum, which happens when an old standard that should be maintained and sustained is not, due to other alternatives.[28] Collective action issues, in the presence of network externalities, are typically due to spillovers across users that are not necessarily internalized properly.[29]

Until recently, the free market shaped standards, and under this system, parties handled license negotiations.[30] That resulted in the growth of innovation-led services and products at a historic rate, spurring development of high-technology industries and benefitting consumers.[31] As with other types of regulatory mechanisms in a free market setting, there is a debate as to how much regulation is adequate and optimal, without curbing the positive elements of the free-market-driven system. Policies that govern SSOs are based on the operating performance and the

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[25] Alden Abbott, *Patent Policy Change Would Undermine Property Rights and Innovation*, HERITAGE FOUND. (Mar. 4, 2015), http://www.heritage.org/research/reports/2015/03/patent-policy-change-would-undermine-property-rights-and-innovation [https://perma.cc/TY9R-3QJC].

[26] *See generally* MANCUR OLSON, JR., THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS (3d ed. 1973), for a discussion of the theory of "collective action."

[27] Joseph Farrell & Garth Saloner, *Standardization, Compatibility, and Innovation*, 16 RAND J. ECON. 70, 71 (1985) (explaining the concept of "excess inertia" and how it impedes the switch to better technology); Kai Reimers and Mingzhi Li, *Should Buyers Try to Shape IT Markets Through Nonmarket (Collective) Action? Antecedents of a Transaction Cost Theory of Network Effects*, *in* STANDARDIZATION RESEARCH IN INFORMATION TECHNOLOGY: NEW PERSPECTIVES 163, 165 (2007).

[28] Farrell & Saloner, *supra* note 27, at 78–79 (explaining the concept of "excess momentum"); Reimers and Li, *supra* note 27, at 165.

[29] Farrell & Saloner, *supra* note 27, at 78–79.

[30] Abbott, *supra* note 25.

[31] *Id.*

impact in the market for standards, technologies, and products.[32] There are concerns that certain SEP holders may seek to exclude rivals from relevant downstream markets by either imposing discriminatory terms or refusing to license technologies that are necessary to practice the standard.[33] It is further claimed that some SEP holders might also exploit the additionally-gained market power through the inclusion of their IP in the standard to charge prices that are excessive.[34] SSOs have responded to the increasing number of patents covering standardized technologies and the perceived threats of patent hold-up and stacking by adopting a series of policy measures intended to address these concerns.[35]

The two types of patents in standardization include minor or nonessential patents, and essential patents. The former correspond to technology, for which alternatives exist.[36] The essential patents cannot be bypassed because they implement the functionality of the standard.[37] Much like patents, there are two types of disclosures: generic and specific. Generic disclosures are related to cost containment, and they avoid the need for a thorough patent search.[38] Specific disclosures invite concern about antitrust claims and thus must disclose all relevant IP.[39] "If the firm neglects to include all IP that could be relevant, even if the omission was unintentional, the firm may be vulnerable to antitrust claims if it seeks to enforce its patent portfolio."[40] Unlike the case for specific disclosures, generic disclosures guarantee "that all relevant patents will be available on FRAND terms."[41] FRAND commitments are made to address problems

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[32] Neil Gandal & Pierre Regibeau, *Standard-Setting Organizations*, *in* THE LAW, ECONOMICS AND POLITICS OF INTERNATIONAL STANDARDISATION 394, 395 (Panagiotis Delimatsis ed., 2015).

[33] Roberto Grasso, *Selected Issues in SEP Licensing in Europe: The Antitrust Perspective*, *in* COMPLICATIONS AND QUANDARIES IN THE ICT SECTOR, *supra* note 24, at 79, 81.

[34] *Id.*

[35] *See* Contreras, *supra* note 24, at 5.

[36] Lerner et al., supra note 13, at 8.

[37] *Id.*

[38] *Id.* at 6.

[39] *Id.*

[40] *Id.*

[41] *Id.* at 6–7.

for potential anti-competitive issues.[42] They reflect an *ex-ante* competitive commitment by the IP owner to a prospective implementer of the standard.[43] This gives SEP holders the ability to engage in "hold-up" and *ex-post* market power.[44] The problem lies in there being virtually no agreeable definition of FRAND, as SSOs have disclaimed their role in adjudicating, interpreting, or establishing the contours of FRAND licensing terms.[45] This lack of certainty has contributed to recent litigation over FRAND commitments and leaves most of the details of licensing arrangements to bilateral negotiations among patent holders and potential licensees.[46] For standards to succeed, implementers must have access to patented technologies in which they receive returns on their investments. Contributors of patented technology deserve a market reward, without which they are unlikely to further invest and contribute innovative technologies to future standard-setting.

III. THE WIFI STANDARD AND AMENDMENTS TO IEEE'S PATENT POLICY

IEEE-SA Standard 802.11 is the core WiFi standard that has a long list of companies that have pledged their patents to be used in the development and use of the standard.[47] The ongoing process of asking for commitments from patent holders for patents essential to the standard and the standard's subsequent upgrades are detailed on IEEE-SA's website.[48] The written commitment given by each patent holder, called a Letter of Assurance

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[42] Janusz Ordover & Allan Shampine, *Implementing the FRAND Commitment*, ANTITRUST SOURCE, Oct. 2014, at 1, 1, https://www.americanbar.org/content/dam/aba/publishing/antitrust_source/oct14_ordover_10_21f.authcheckdam.pdf [https://perma.cc/5963-XMLU].

[43] *Id.*

[44] *Id.*

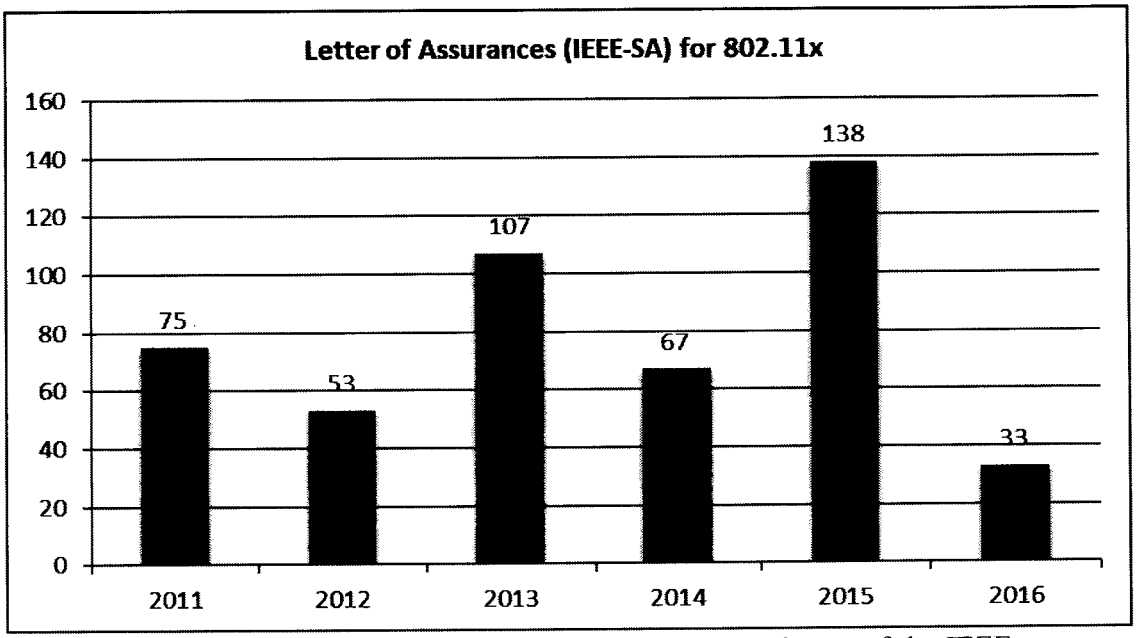
[45] Jorge Contreras, *A Brief History of FRAND: Analysing Current Debates in Standard Setting and Antitrust Through a Historical Lens*, 80 ANTITRUST L.J. 39, 42 (2015).

[46] *Id.* at 73.

[47] Response of Cisco Sys., Hewlett-Packard Co., Int'l Bus. Machs. Corp., & Research in Motion Ltd., to FTC Request for Comment on Standard-Setting Issues (Aug. 1, 2011), https://www.ftc.gov/sites/default/files/documents/public_comments/request-comments-and-announcement-workshop-standard-setting-issues-project-no.p111204-00035%C2%A0/00035-80135.pdf [https://perma.cc/3FSN-FPYH].

[48] *Submitting a Project Request*, IEEE-SA, http://standards.ieee.org/develop/par.html [https://perma.cc/7VJQ-X3HK].

(LOA), states the terms on which the patent is committed to the SSO.[49] At the time of standard-setting, the standard participants do not have a sense of the market value that will eventually develop, which makes it rather difficult to agree on the value of a standard technology or the patents essential to it. Given this scenario, parties agree to a framework of use, which in simple terms is FRAND licensing terms. The chart below shows the changes in the LOAs received by IEEE-SA for the different versions of the 802.11 standard for the past 5 years.[50]



Source: Authors' calculations based on meeting minutes of the IEEE-SA Standards Board (PatCom) from 2011 until the last PatCom meeting held December 5, 2016.[51] The number of LOAs includes those that were received, accepted and posted by PatCom. One negative LOA was

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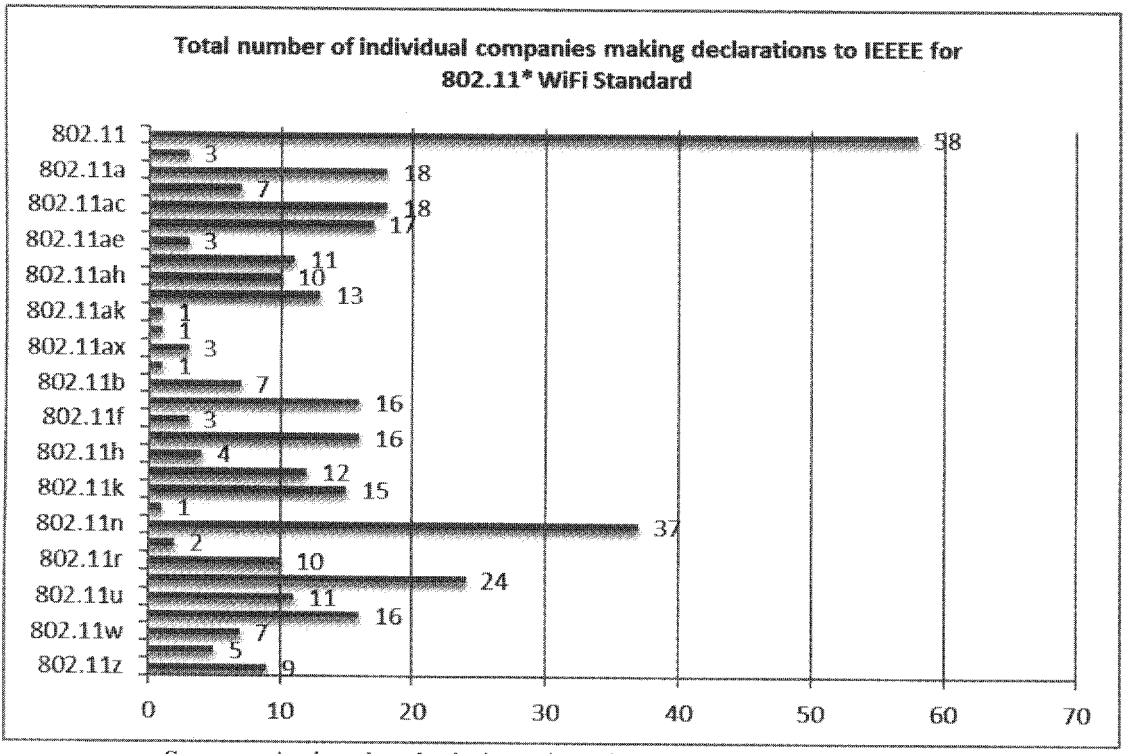
[49] *Sample Letter of Assurance for Essential Patent Claims*, IEEE-SA, https://development.standards.ieee.org/myproject/Public/mytools/mob/loa.pdf [https://perma.cc/CXB5-WFMP].

[50] *IEEE 802.11 and Amendments Patent Letters of Assurance*, IEEE-SA, http://standards.ieee.org/about/sasb/patcom/pat802_11.html [https://perma.cc/R97G-9VW8].

[51] *PatCom Meeting Information*, IEEE-SA, http://standards.ieee.org/about/sasb/patcom/meetings.html [https://perma.cc/8J25-UPBE].

submitted in 2012 (received in the meeting held on June 6, 2012)[52] and, overall, eight negative LOAs were submitted in 2016.[53]



Source: Authors' calculations based on IEEE-SA Standards Board (PatCom) records of letters of assurance for IEEE standard 802.11 and amendments.[54]

The new patent policy in essence was a series of important developments that eventually resulted in changes to the existing one being

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[52] *PatCom Meeting Minutes June 2012*, IEEE-SA, http://standards.ieee.org/about/sasb/patcom/0612mins.pdf [https://perma.cc/KZN8-BHUC].

[53] *PatCom Meeting Minutes December 2016*, IEEE-SA, http://standards.ieee.org/about/sasb/patcom/1216patmins.pdf [http://perma.cc/YQM2-PYW7]; *PatCom Meeting Minutes September 2016*, IEEE-SA, http://standards.ieee.org/about/sasb/patcom/0916patmins.pdf [http://perma.cc/526N-RL36]; *PatCom Meeting Minutes June 2016*, IEEE-SA, http://standards.ieee.org/about/sasb/patcom/0616patmins.pdf [http://perma.cc/2S79-K9HP]; *PatCom Meeting Minutes March 2016*, IEEE-SA, http://standards.ieee.org/about/sasb/patcom/0316patmins.pdf [http://perma.cc/YZ6N-RZFT].

[54] *IEEE 802.11 and Amendments Patent Letters of Assurance*, *supra* note 50.

implemented by IEEE. It started off with the IEEE's attorney highlighting the insufficiency of the 2007 patent policy in dealing with the problem regarding the vagueness of FRAND. Ever since the amendment came into existence, the SEP holders had only twice made use of the opportunity to disclose the most restrictive terms—out of a possible forty occasions in which an LOA committing to license on FRAND terms was issued.[55] This was followed by the Board of Governors of IEEE-Standards Association giving its approval to the changes in December 2014.[56] Finally, in February 2015, the Antitrust Division of the United States Department of Justice (DOJ), in a Business Review Letter to the IEEE, expressed its intention to not challenge the proposed patent policy changes.[57] The IEEE had requested the Business Review Letter as a result of concerns raised by some members regarding the amendments as well as the process that was followed by IEEE-SA to draft and approve the amendments, thereby raising risk of antitrust scrutiny of the organization.[58] The DOJ seemingly based its conclusion regarding the policy changes resulting in "pro-competitive effects on policy preferences rather than a careful rule of reason analysis."[59]

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[55] Nicolo Zingales & Olia Kanevskaia, *The IEEE-SA Patent Policy Update Under the Lens of EU Competition Law* 21–22, (TILEC Discussion Paper No. 2016-031, 2016), https://ssrn.com/abstract=2878623 [https://perma.cc/T5ZU-Z4E2].

[56] *Board of Governors Resolutions,* IEEE-SA, https://standards.ieee.org/about/bog/resolutions.html [https://perma.cc/ZZP8-5NMP].

[57] Response from Renata B. Hesse, Acting Assistant Attorney General, U.S. DOJ (Antitrust Division), to Michael A. Lindsay, Esq., Dorsey & Whitney LLP, on behalf of Inst. of Electrical & Electronic Eng'rs (Feb. 2, 2015), http://www.justice.gov/atr/public/busreview/311470.html [https://perma.cc/75LN-94LL].

[58] Letter from Michael A. Lindsay, Esq., Dorsey & Whitney LLP, on behalf of Inst. of Electrical & Electronic Eng'rs, to Hon. William J. Baer, Assistant Attorney General, U.S. DOJ (Sept. 30, 2014), https://www.justice.gov/sites/default/files/atr/legacy/2015/02/17/311483.pdf [https://perma.cc/FXF9-S6KB] (requesting a business review letter pursuant to the Department's business review procedure, 28 C.F.R. § 50.6).

[59] Stuart M. Chemtob, *Carte Blanche for SSOs?: The Antitrust Division's Business Review Letter on the IEEE's Patent Policy Update*, CPI ANTITRUST CHRON., March 2015, at 2, https://www.wsgr.com/publications/PDFSearch/chemtob-0315.pdf [https://perma.cc/UM6V-82YQ] ("The DOJ's devaluing of concerns about harm to innovation incentives has serious implications that will affect the choices made by other SSOs, as well as enforcement policies of foreign competition authorities looking to United States antitrust law for guidance on the proper relationship between antitrust laws and intellectual property laws.").

On February 8, 2015, the Board of Governors, the Standards Board, the Board of Directors, and the Patent Committee (PatCom) of the IEEE, voted to approve updates to the patent policy of IEEE-SA.[60] The updates to IEEE-SA went into effect March 15, 2015 and received a great deal of criticism and feedback.[61] The updates see, *inter alia*, significantly reduced royalty fees from large vendors, particularly in the wireless communication sector, and compensation for a company's patents no longer based on the value of the end device, but rather on a percentage of the price of the component that is patented.[62] This revised approach to royalties is seen as a realistic definition of what represents FRAND licensing as it pertains to SEPs, such that the inventors get a fair return on some sizable investments into creating innovations, while allowing for easier entry of new suppliers and new products.[63] However, some proponents of the update say that it could possibly hinder innovation.[64] As we show below, the amendments to the IEEE patent policy seem to have addressed certain ambiguities, but overall, it has created a potential to lower the leverage for patent owners by undermining their patents, which can potentially lead to an explosion of litigation. It emerged that the ad-hoc committee responsible for drafting the amendments met in closed sessions and sought comments on the draft from members.[65] However, a significant number of IEEE-SA members

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[60] Rudi Bekkers, *Concerns and Evidence for Ex-post Hold-up with Essential Patents* (Eindhoven Univ. of Tech., Working Paper, 2015), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2663939 [https://perma.cc/V6WT-3ZKV].

[61] *Board of Governors Resolutions*, *supra* note 56. *See also* Benjamin C. Li, *The Global Convergence of FRAND Licensing Practices: Towards "Inoperable" Legal Standards*, 31 BERKELEY TECH. L.J. 429, 463 (2016) (discussing the mixed reviews received by the new policy); Deepa Sundararaman, *Inside the IEEE's Important Changes to Patent Policy*, LAW 360 (Apr. 3, 2015), https://advance.lexis.com/api/permalink/3ca3eb00-8a2a-4ebb-b031-53e17586f8be/?context=1000516 (last visited Mar. 24, 2018) (discussing the split reactions of patent holders). The author notes that the policy has support from some large technology companies while large companies on the other side argue that the "changes go too far." *Id.*

[62] Li, *supra* note 61, at 463.

[63] Sundararaman, *supra* note 61.

[64] *See* Li, *supra* note 61, at 463–64; Sundararaman, *supra* note 61.

[65] Email from Qualcomm, Nokia, NSN, & Blackberry to the Members of the SASB (June 9, 2014), http://grouper.ieee.org/groups/pp-dialog/email/msg00287.html [https://perma.cc/8TA8-8RME] (describing that the deliberations of the Patent Committee Ad Hoc were not open to non-members and there was no public announcement of any vote

(*continued*)

who had contributed patented technology of high value to standards raised objections to the substance of the proposed changes and expressed their disapproval for the manner in which the process of developing the new policy unfolded.[66] Among the multiple complaints raised by the critics was the composition of the committee not being representative of the interests of the patent owners and most of their comments and suggestions not being taken into account.[67] Rather, the policy update was used by some of the major technology users to further their own commercial interests, and any involvement on the part of technology owners was left to the final stages of the process.[68]

A. Royalty Rate

Article 6.1 of the IEEE's IP policy defines the term "complaint implementation" as "*any product* (e.g., component, sub-assembly, or end-product) or service that conforms to any mandatory or optional portion of a normative clause of an IEEE Standard."[69] Thus, it treats the product components and other sub-assemblies as products for the purpose of standard-compliant implementation.[70] Furthermore, the amended policy defines "reasonable rate" as follows:

> "Reasonable Rate" shall mean appropriate compensation to the patent holder for the practice of an Essential Patent

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taken by the Ad Hoc, but that they did receive a number of comments and responded to them).

[66] *See id.* The email known as the "Four Company Letter" lays out grievances on behalf of Qualcomm, Inc., Nokia Solutions, Networks Oy, Nokia Oy, and Blackberry Ltd. and illustrates, in their view, how the policy and its formation was wholly inconsistent with the SASB's principles of "consensus, due process, openness, and balance." *Id.*

[67] *See id.* They express their view that the basic principles of due process were not adhered to. *Id.* They complained that the consensus—the bedrock of the standard-setting process of IEEE technical standards—was missing from the deliberations and formulation stage of the new policy. *Id.*

[68] *Id.*

[69] IEEE-SA STANDARDS BOARD BYLAWS § 6.1 (INST. OF ELECTRICAL & ELECTRONIC ENG'RS 2017), http://standards.ieee.org/develop/policies/bylaws/sb_bylaws.pdf [https://perma.cc/HK5B-JF22] (emphasis added).

[70] J. Sai Deepak, *Standard-Essential Patents: Comparing IP Rights Policies*, INT'L L. OFF. (Feb. 29, 2016), http://www.internationallawoffice.com/Newsletters/Intellectual-Property/International/Saikrishna-Associates/Standard-essential-patents-comparing-IP-rights-policies [https://perma.cc/T9U5-VGYG].

> Claim excluding the value, if any, resulting from the inclusion of that Essential Patent Claim's technology in the IEEE Standard. In addition, determination of such Reasonable Rates should include, but need not be limited to, the consideration of:
>
> - The value that the functionality of the claimed invention or inventive feature within the Essential Patent Claim contributes to the value of the relevant functionality of the smallest saleable Compliant Implementation that practices the Essential Patent Claim.
> - The value that the Essential Patent Claim contributes to the smallest saleable Compliant Implementation that practices that claim, in light of the value contributed by all Essential Patent Claims for the same IEEE Standard practiced in that Compliant Implementation.
> - Existing licenses covering use of the Essential Patent Claim, where such licenses were not obtained under the explicit or implicit threat of a Prohibitive Order, and where the circumstances and resulting license are otherwise sufficiently comparable to the circumstances of the contemplated license.[71]

Rather than leaving the parties at liberty to decide how the royalties would be calculated, the IEEE, with this change in the policy, endorses a royalty calculation based on the value of the chipset, despite there being a possibility of several other functions of the device using the contributed technology.[72] This change in the calculation of the royalty base is a derivation from the SSPPU, or the "smallest saleable patent practicing unit" concept, that is prevalent predominantly in the United States[73] and is

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[71] IEEE-SA STANDARDS BOARD BYLAWS, *supra* note 69, § 6.1.

[72] Bill Merritt, *Why We Disagree with the IEEE's Patent Policy,* EE TIMES BLOG (Mar. 27, 2015, 7:00 AM), http://www.eetimes.com/author.asp?doc_id=1326144 [https://perma.cc/BD43-PUD3].

[73] Anne Layne-Farrar, *The Practicalities and Pitfalls of the Smallest Saleable Patent Practicing Unit Doctrine: A Review of Teece and Sherry*, 51 LES NOUVELLES J. LICENSING EXECUTIVES SOC'Y 234 (2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2855148 [https://perma.cc/N3T9-Q9VK].

indeed a bitterly contested one as the new rule concerning royalties would lead to a lesser royalty being paid by large vendors, especially in the wireless sector.[74] But the IEEE's endorsement of the smallest saleable compliant implementation is a little off the mark since the SSPPU concept was adopted in the United States in order to avoid undue prejudice and jury confusion in jury trials.[75] Using the same as a base for real-world arm's-length negotiations between sophisticated market players[76] and circumscribing the terms of licensing negotiations was never going to be well-received by members of the association.[77] Furthermore, the SSPPU model is not an all-pervasive rule in the United States, as has been highlighted in several cases; one of them being *Ericsson v. D-Link*, wherein the Federal Circuit recognized the licenses to be negotiated sans any consideration of the entire-market-value rule (EMVR) or the SSPPU model and rather adhere to comparable licenses based on the end product.[78] The Federal Circuit's ruling in the *Ericsson* case follows the rationale laid down in *Virnetx Inc.* v. *Cisco Systems*[79] regarding royalty rate.[80] It was held that "though there were undoubtedly differences between the licenses at issue and the circumstances of the hypothetical negotiation, the jury was entitled to hear the expert testimony and decide for itself what to accept or

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[74] John Walko, *IEEE Waves Through Controversial Patent Policy*, EE TIMES BLOG (Feb. 17, 2015, 3:01 PM), http://www.eetimes.com/author.asp?section_id=36&doc_id=1325706 [https://perma.cc/YNB9-L8W6].

[75] Keith Mallinson, *Free and Fair Trade in IP Would Be Crushed by Compulsory Chip-Based SEP Licensing* , IP FINANCE BLOG (Sept. 9 2016), http://www.wiseharbor.com/pdfs/Mallinson%20licensing%20based%20on%20device%20or%20SSPPU%2009Sept2016.pdf [https://perma.cc/6RES-RQHT].

[76] Abbott, *supra* note 25.

[77] *Id.*

[78] 773 F.3d 1201, 1228 (Fed. Cir. 2014); David Long, *Federal Circuit Gives Guidance on Litigating RAND Royalty (*Ericsson v. D-Link*)*, ESSENTIAL PAT. BLOG (Dec. 5, 2014), https://www.essentialpatentblog.com/2014/12/ federal-circuit-gives-guidance-on-litigating-rand-obligation-ericsson-v-d-link/ [https://perma.cc/WC5Q-7TRA].

[79] 767 F.3d 1308, 1327 (Fed. Cir. 2014).

[80] David Long, *Patent Case: Federal Circuit Provides Guidance on Damages That Eschews Use of Nash Bargaining Solution (*Virnetx v. Cisco*)*, ESSENTIAL PAT. BLOG (Sept. 17, 2014), http://www.essentialpatentblog.com/2014/09/patent-case-federal-circuit-provide-damages-guidance-that-eschews-use-of-nash-bargaining-solution-virnetx-v-cisco/ [https://perma.cc/2Y6E-U9UP].

reject."[81] The ultimate benefit derived by an end product from a claimed invention and the reasonableness of the licensing terms is largely dependent on the specificity of the patent and the product to be licensed rather than the smallest saleable patent practicing unit.[82]

SSPPU has been described as "a 'term of art' that was developed through judicial decision in patent infringement cases in the United States."[83] The jury in such cases weighed several competing and prospective patent valuation techniques (for the infringed patent) to arrive at SSPPU as one way to assign a value to a patent.[84]

The amendments in the policy may lead to a scenario wherein the patent owners draft claims in order to expand what constitutes a "Compliant Implementation." Given this situation, defining the scope of a "reasonable" royalty may still need to be determined, taking into consideration the specific patent and products in issue, rather than the smallest saleable Compliant Implementation. The issues of fixing the royalty base might be best catered to by a continued case-by-case development of what is deemed as reasonable.[85]

B. Injunctive Relief

Another drastic change brought about by the new policy involves the preclusion of an SEP holder from seeking injunctive relief against an unwilling licensee.[86] An exception to the policy involves the litigation of FRAND royalty and the initial stage of appeal being exhausted.[87] The amendment regarding injunctive relief being sought is worded as:

> A statement that the Submitter will make available a license for Essential Patent Claims to an unrestricted number of Applicants on a worldwide basis without

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[81] *Virnetx*, 767 F.3d at 1331.

[82] *Id.* at 1327.

[83] Mallinson, *supra* note 75.

[84] *Id.* Mallinson states that in a typical patent infringement case, where only a handful of patent rights are at issue and the scope of the claims of each patent is defined by the court, it might be possible to establish the value of SSPPU. *Id.* However, it is not a substitute for how a patent licensor and licensee value an entire portfolio of patents. *Id.* Mallinson claims that SSPPU "ignores realities of licensing," and even if it is applied, in value terms, it would eventually come close to the value of the entire device. *Id.*

[85] *See Virnetx, Inc.*, 767 F.3d at 1333.

[86] Sundararaman, *supra* note 61.

[87] *Id.*

> compensation or under Reasonable Rates, with other reasonable terms and conditions that are demonstrably free of any unfair discrimination to make, have made, use, sell, offer to sell, or import any Compliant Implementation that practiced the Essential Patent Claims for use in conforming with the IEEE Standard. An Accepted LOA that contains such a statement signifies that reasonable terms and conditions, including without compensation or under Reasonable Rates, are sufficient compensation for a license to use those Essential Patent Claims and preclude seeking, or seeking to enforce, a Prohibitive Order except as provided in this policy. The Submitter of an Accepted LOA who has committed to make available a license for one or more Essential Patent Claims agrees that it shall neither seek nor seek to enforce a Prohibitive Order based on such Essential Patent Claim(s) in a jurisdiction unless the implementer fails to participate in, or to comply with the outcome of, an adjudication, including an affirming first-level appellate review, if sought by any party within applicable deadlines, in that jurisdiction by one or more courts that have the authority to: determine Reasonable Rates and other reasonable terms and conditions; adjudicate patent validity, enforceability, essentiality, and infringement; award monetary damages; and resolve any defenses and counterclaims. In jurisdictions where the failure to request a Prohibitive Order in a pleading waives the right to seek a Prohibitive Order at a later time, a Submitter may conditionally plead the right to seek a Prohibitive Order to preserve its right to do so later, if and when this policy's conditions for seeking, or seeking to enforce, a Prohibitive Order are met.[88]

The above change in the policy is contrary to the universally accepted availability of injunctive relief to SEP holders against unwilling licensees.[89] The revised policy makes injunctive relief available to a

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[88] IEEE-SA STANDARDS BOARD BYLAWS, *supra* note 69, § 6.2.

[89] MICHAEL FRÖHLICH, REPORT—WORK PLAN ITEM #5: AVAILABILITY OF INJUNCTIVE RELIEF FOR FRAND-COMMITTED STANDARD ESSENTIAL PATENTS, INCL. FRAND-DEFENSE IN PATENT INFRINGEMENT PROCEEDINGS 5 (Mar. 2014), http://aippi.org/wp-content/uploads/committees/222/Report222AIPPI+report+on+the+availability+of+injunctiv

(*continued*)

patentee only in case of an implementer of a standard failing to abide by a decision of a court or an arbitral tribunal.[90] By making injunctive relief increasingly difficult to obtain, the new policy stands to further reduce the leverage held by SEP holders over infringers/unwilling licensees. Furthermore, it may lead to increased litigation between standard developers and implementers,[91] for it appears to be in stark contrast to case law and administrative decisions that have deliberated upon the right of SEP holders to seek injunctive relief and conclusively accepted that it should be made available against unwilling licensees.[92] One can further substantiate the same with the Federal Circuit's ruling in *Apple, Inc. v. Motorola, Inc.*, wherein the court opined that there was no *per se* rule prohibiting a party from seeking injunctive relief on an SEP covered by an agreement to license on FRAND terms.[93] The court further recorded that "an injunction *may be* justified where an infringer unilaterally refuses a FRAND royalty or unreasonably delays negotiations to the same effect."[94] In the above dispute and in the consent decree settlement in the *Google/Motorola* case, the United States Federal Trade Commission called out for injunctive relief to be available against unwilling licensees in limited circumstances.[95]

C. Reciprocal Licensing

The third significant change introduced in the new policy concerns reciprocal licensing. "Reciprocal Licensing" as defined under the new policy means:

> the Submitter of an LOA has conditioned its granting of a license 67 for its Essential Patent Claims upon the Applicant's agreement to grant a license to the Submitter with Reasonable Rates and other reasonable licensing

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e+relief+for+FRAND-committed+standard+essential+patentsEnglish.pdf [https://perma.cc/QA3S-SX89].

[90] Sundararaman, *supra* note 61.

[91] G. Thomas Stromberg & Marc A. Roualet, *New IEEE Policy Affects Standard Essential Patent Holders*, LEXOLOGY (Apr. 1, 2015), http://www.lexology.com/library/detail.aspx?g=b145d1e6-f42d-4655-813f-de1490a980e5 [https://perma.cc/W79H-7LPZ].

[92] FRÖHLICH, *supra* note 89, at 5.

[93] *See id.* at 9; Apple, Inc. v. Motorola, Inc., 757 F.3d 1286, 1331 (Fed. Cir. 2014).

[94] *Apple*, 757 F.3d at 1332 (emphasis added).

[95] Motorola Mobility L.L.C., F.T.C. No. 121-0120 (July 23, 2013).

> terms and conditions to the Applicant's Essential Patent Claims, if any, for the referenced IEEE Standard, including any amendments, corrigenda, editions, and revisions. If an LOA references an amendment or corrigendum, the scope of reciprocity includes the base IEEE Standard and its amendments, corrigenda, editions, and revisions.[96]

The SEP holder is precluded from conditioning the grant of a license on a reciprocal access to the other negotiator's non-SEP patents.[97] This implies that access to key standardized technology must be granted by an SEP holder to another party without being in a position to insist upon the reciprocal access to the other party's technology, which might be deemed vital for the commercialization of the SEP holder's products.[98] This may end up leaving the owners of multiple SEPs in a rather disadvantageous position in comparison to those involved in non-SEP patenting and large businesses might be disincentivized from developing and investing in patents that could raise the quality of standard-setting, which may in turn lead to a lower level of usefulness of important standards.[99]

Furthermore, there is a likelihood of disruption of the existing licensing practices involving cross-licensing negotiations, leading to a possibility of higher downstream prices in the form of royalty-stacking. In essence, it is a manifestation of the "Cournot Complements" principle, which states that the overall price of complimentary inputs sold by different firms is likely to be higher, as opposed to the inputs being sold by a single entity.[100] Cross-licensing addresses this issue, albeit between two firms, by smoothening the negotiations between the holders of complimentary patents, resulting in lowered making cost for standards-compliant products. However, the policy update may result in the

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[96] IEEE-SA STANDARDS BOARD BYLAWS, *supra* note 69, § 6.2.

[97] Sundararaman, *supra* note 61.

[98] IEEE-SA STANDARDS BOARD BYLAWS § 6.1 (INST. OF ELECTRICAL & ELECTRONIC ENG'RS, Draft No. 39, 2014) [hereinafter IEEE-SA DRAFT STANDARDS], http://grouper.ieee.org/groups/pp-dialog/drafts_comments/SBBylaws_100614_redline_current.pdf [https://perma.cc/63ME-C4VL].

[99] Abbott, *supra* note 25.

[100] Ramon Casadesus-Masanell et al., *Competing Complements* 1 (Harvard Bus. Sch., Working Paper No. 09-009, 2008), http://www.hbs.edu/faculty/Publication%20files/09-009.pdf [https://perma.cc/88GE-SD4X].

consumers having to pay a higher cost for products, while at the same time strangulating innovation efforts.[101]

IV. POLICY IMPLICATIONS AND LESSONS FOR INDIA

According to the IEEE, "[R]ules require that standards be developed under procedures that incorporate due process, openness, transparency, broad consensus building, and balance without dominance to ensure that all parties are heard."[102] Many within the high-technology industries have expressed their disdain for the policy changes, as it has greatly shifted the terms on which patents can be made available to implementers of patented technology.[103] According to Irwin Jacobs, CEO of Emeritus, "[T]he proposed changes, and the process that has been followed, threaten the reputation and future of the IEEE as a developer of advanced technology".[104] Jacobs follows many other vocal CEOs and critics who believe that the changes provide short-term commercial benefits to investors by lowering fees that could create long-term effects that reduce the incentive for R&D.[105]

The Innovation Alliance has called for a reversal to the policy changes, as they suggest it would "arbitrarily reduce the level of protection given to Wi-Fi related patents, impose unconstitutional limits on patent rights, and end the traditional market-based negotiation process for these patents by imposing what amount to de facto compulsory licensing."[106] Research by Ron Katznelson in 2016 indicates that there is a substantial rise in both negative LOAs and in missing LOAs where the IEEE did not receive an LOA in response.[107] There is an 83% decline in the net average supply rate of nonduplicate LOAs for the IEEE 802.11 k and h standards.[108]

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[101] Abbott, *supra* note 25.

[102] *IEEE Statement Regarding Updating of Its Standards-related Patent Policy*, IEEE, (Feb. 8, 2015), https://www.ieee.org/about/news/2015/8_february_2015.html [https://perma.cc/9UBC-SSZD].

[103] Walko, *supra* note 74.

[104] *Id.*

[105] *Id.*

[106] *Id.*

[107] Ron. D. Katznelson, The IEEE Controversial Policy on Standard Essential Patents: The Empirical Record Since Adoption, Symposium on Antitrust, Standard Essential Patents, and the Fallacy of the Anticommons Tragedy, Berkeley, California (Oct. 29, 2016), https://works.bepress.com/rkatznelson/80/ [https://perma.cc/FJB6-CN7P].

[108] *Id.*

Period-Wise receipt of LOAs by IEEE-SA for 802.1x

	No	Yes	Total
1993-2000	4	38	42
2001-2005	0	71	71
2006-2010	1	113	114
2011	0	26	26
2012	0	9	9
2013	0	34	34
2014	0	22	22
2015	0	33	33
2016	7	3	10

Source: Authors' calculations based on IEEE-SA Standards Board (PatCom) records of letters of assurance for IEEE Standard 802.11 and amendments.[109]

The new policy, while making the right to seek injunctive relief conditional, does not provide an explanation as to its exclusion or conditional availability to patent holders having made commitments in compliance with FRAND terms,[110] given that it is a part of the patent enforcement system in the United States. For example, SEP holders often seek injunctions against implementers when they have used the technology without seeking licenses from the patent owner.[111] The possibility of a patent hold-out and refusal to pay royalties (or for that matter, refusal to enter into good faith negotiations) is often disregarded.[112] As Administrative Law Judge Theodore R. Essex commented in the public

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[109] *IEEE 802.11 and Amendments Patent Letters of Assurance*, *supra* note 50.

[110] *See* IEEE-SA DRAFT STANDARDS, *supra* note 98.

[111] *See* Daryl Lim, *Standard Essential Patents, Trolls, and the Smartphone Wars: Triangulating the End Game*, 119 PENN ST. L. REV. 1, 3–5 (2014).

[112] *See* David J. Teece & Edward F. Sherry, *The IEEE's New IPR Policy: Did the IEEE Shoot Itself in the Foot and Harm Innovation?* 6 (Tusher Ctr. for the Mgmt. of Intellectual Capital, Working Paper Series No. 13, 2016), http://businessinnovation.berkeley.edu/wp-content/uploads/2014/07/Tusher-Center-Working-Paper-No.-13.pdf [https://perma.cc/Q26P-5D2J].

version of his initial determination in the ITC Investigation, standards implementers using the technology incorporated in the standard but without seeking a license or without engaging in licensing negotiations can lead to SEP holders filing a suit against the standards implementers and the standards implementers being forced to pay royalties at the FRAND rate, the same FRAND rate at which they were willing to pay the royalties in the first place.[113] By engaging in such behavior, the standards implementers are able to shift the entire risk associated with licensing negotiations onto the SEP holders.[114] In the words of Judge Essex, taking away the right to seek injunctive relief from SEP holders not only "puts the risk of loss entirely on the side of the patent holder," but also "encourages patent hold-out, which is as unsettling to a fair solution as any patent hold-up might be."[115]

The biggest and perhaps most debatable change brought about by this new policy is that of the royalties being based on the smallest saleable compliant implementation rule.[116] There are strong reasons for staking a strong claim against the use of this model for royalty calculation. To begin with, it is not always the case that the return value received by an implementer is a true reflection of the contribution made by the smallest saleable unit to the product. In fact, the entire process of negotiation between the SEP holders and the implementers hinges on the true value of the patented technology to the implementer.[117] The value can often lie somewhere between the smallest saleable unit and other compliant implementations.[118] Thus, keeping the smallest saleable compliant implementation model as the base for royalty determination can lead the implementer into an unfairly advantageous position compared to the technology provider. According to David J. Teece and Edward F. Sherry,

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[113] *In re* Certain Wireless Devices with 3G and/or 4G Capabilities and Components Thereof, Inv. No. 337-TA-868, USITC Pub. 4475, 113–14 (June 13, 2014) (Initial).

[114] *Id.* at 114.

[115] *Id. See also* Sandra Badin et al., *Patent Hold-up or Patent Hold-out? Judge Essex Adds His Voice to the SEP-FRAND Debate*, INTELL. PROP. ALERT (July 10, 2014), https://www.mintz.com/newsletter/2014/Advisories/4096-0714-NAT-IP/4096-0714-NAT-IP.pdf [https://perma.cc/GR76-G8JS].

[116] *See* David Long, *IEEE's Controversial Proposed Intellectual Property Rights ("IPR") Policy Amendments*, ESSENTIAL PAT. BLOG (Feb. 3, 2015), https://www.essentialpatentblog.com/2015/02/ieee/ [https://perma.cc/6X4A-N23R].

[117] *See* Teece & Sherry, *supra* note 112, at 3–4.

[118] *Id.*

there lies a "synergistic value" between the smallest saleable unit and other compliant implementations. At times, these "synergistic values," which may flow from the smallest saleable unit providing an additional value to the product, leads to increased returns on the products to the implementer.[119] Undue focus on the smallest saleable unit leads to ignorance of this "synergistic value" (which can be considerable in certain cases) and its share not being transferred to the SEP holder.

In the case of *Commonwealth Scientific & Industrial Research Organisation (CSIRO) v. Cisco Systems, Inc.*, involving WLAN cellular technology, Justice Davis stated:

> The benefit of the patent lies in the [technological] idea, not in the small amount of silicon that happens to be where that idea is physically implemented. . . . Basing a royalty solely on chip price is like valuing a copyrighted book based only on the costs of the binding, paper, and ink needed to actually produce the physical product. While such a calculation captures the cost of the physical product, it provides no indication of its actual value.[120]

In a similar manner, because it is the competition and costs that drive the chipset prices and profits, it might be far-fetched to believe that basing the royalties on chipset prices would adequately compensate the patent holders, especially in cases where the chipsets prices were set without adequately considering the royalties. Therefore, it is likely that the value received by the patent holders for the utilization of their technology by the implementers might not be efficiently reflected in the prices of chipsets or the profit margins.[121] From both a public policy and economic perspective, the changes to the IEEE policy have produced numerous criticisms that

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[119] *Id.* at 8.

[120] Commonwealth Sci. & Indus. Research Org. v. Cisco Sys., Inc., 809 F.3d 1295, 1300 (Fed. Cir. 2015) (quoting Commonwealth Sci. & Indus. Research Org. v. Cisco Sys., Inc., No. 6:11-cv-343, 2014 WL 3805817, at *11 (E.D. Tex. July 23, 2014)). *See also* Jorge L. Contreras, *Guest Post by Prof. Contreras—*CSIRO v. Cisco*: The Convergence of RAND and Non-RAND Royalties for Standards-essential Patents*, PATENTLYO (Dec. 7, 2015), http://patentlyo.com/patent/2015/12/convergence-royalties-standards.html [https://perma.cc/UMR5-A64D].

[121] *See* Teece & Sherry, *supra* note 112, at 8–9.

amounts to FRAND benefiting implementers at the expense of patent holders.[122]

The functioning of the standard development organizations (SDOs) and their IPR policies play a key role in maintaining a delicate balance between companies pursuing diverse business models. The new IPR policy of IEEE might slow down (symptoms are already pointing in that direction) advancement of technologies that are crucial for a wide range of sectors in India. These changes will adversely affect the licensing business model by unfairly tilting the delicate balance of the negotiating leverage in favor of a handful of technology giants that have a sizable control over this standards body.[123] Apart from the fact that it will exponentially decrease the value of patents—the most critical IPR for the industry—it will force innovators at the periphery to curtail R&D expenditure and innovation. Those governing the activities of IEEE stand to gain, just like the GSM players of the 1990s, as they do not have an advertised licensing model of enabling manufacturers to compete in the market.[124]

A study on patenting in telecom technologies in India by Contreras and Lakshany found a total of 23,569 patents (granted and applied) between 2000 and 2015.[125] Out of this, Indian firms accounted for a mere eighteen applications, with no patent issued thus far.[126] Local smartphone sellers account for zero granted or pending patents.[127] This is because these companies are merely assemblers of Semi-Knockdown Kits that are imported from China.[128] They virtually have no investments in design and R&D of meaningful technologies, since it is cheaper to import a manufactured printed circuit board (where lies the maximum potential for R&D and design) compared to the finished handset.[129] If India decides to follow the path being treaded upon by the IEEE through this latest change in its policy, the value of IPR will erode drastically, and it will extinguish

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[122] *See id.* at 9.

[123] *See id.* at 6.

[124] *See id.*

[125] Jorge L. Contreras & Rohini Lakshané, *Patents and Mobile Devices in India: An Empirical Survey,* 50 VAND. J. OF TRANSNAT'L L. 1, 35–36 (2017).

[126] *Id.* at 36.

[127] *Id.*

[128] *Id.* at 11.

[129] *Id.*; DIETER ERNST, UPGRADING INDIA'S ELECTRONICS MANUFACTURING INDUSTRY: REGULATORY REFORM AND INDUSTRIAL POLICY (2014), https://www.eastwestcenter.org/sites/default/files/private/ernst-ugradingindia.pdf [https://perma.cc/E4A7-WSXV].

the fire of innovation in the Indian companies, thereby compromising the ideals of "Made in India" and "Designed in India." It will safeguard and sustain the authority of a select group of foreign companies who are currently market leaders in IEEE.[130] Of course, these players can also restrict access to technology and know-how through other mechanisms (such as trade secrets) to appropriate returns to their own innovations, but this would result in higher product prices. Not only will this harm consumers; it will also be detrimental to the pace of adoption and dissemination of technologies in the long run.

Outside India, questions were raised about the compatibility of the new IEEE patent policy with laws in European Parliament, and it was informed that technology developers in Europe and the United States were opposed to this overhauling because it diminishes the value of essential technologies.[131] It was also claimed that ever since the new policies were adopted, European innovators, small and medium enterprises and research organizations in particular, "are finding licensing extremely difficult and the development of important standards for technology, such as Wi-Fi, 5G and the Internet of Things, is already being negatively affected."[132]

V. CONCLUSION

While there is no denying the fact that innovation is the driving force behind economic growth in the ICT and allied sectors, it is also true that patent holders are at the receiving end of only a small fraction of the social benefits attached to the patented inventions. Therefore, it is logical to conclude that any prospective scenario leading to reduced returns on innovation would have an adverse effect on the innovation ecosystem in ways that might be societally undesirable.[133] The changes in the existing policy seem to have done exactly that by ignoring the benefit that a claimed invention can offer to an end product and excluding the value of Essential Patent Claim's technology in the IEEE standard from the scope

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[130] *See* Contreras & Lakshané, *supra* note 125, at 35.

[131] European Parliament, Parliamentary Questions, Question from Ramon Tremosa I Balcells: Compatibility of New IEEE International Trade Rules and EC Laws, E-001945-16 (Mar. 2, 2016), http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+WQ+E-2016-001945+0+DOC+XML+V0//EN [https://perma.cc/84WK-MN5Q].

[132] *Id.*

[133] *See* Abbott, *supra* note 25.

of "reasonable rates."[134] This may lead to all the gains from standardization flowing to the implementers instead of the patent holders, despite their investment in research and development of technology running into millions.

The patent holders would be left to settle for rates negotiated ex-ante, before the incorporation of the technology in the standard. Yes, it may lead to shutting out the possibility of a prospective hold-up, but at the same time, it will result in the patent holders being denied a fair share of the overall gains.[135] These policy changes unnecessarily create an imbalance between the rights of the innovators, in which they lose value on their patents, and the implementers of technologies. In doing so, they interfere in the market processes by incongruously restricting the terms of licensing negotiations. There is a general concern that the changes will reduce the incentives to create technology in the first place, thus reducing the economic incentives to contribute technology to efforts of standardization, which is likely to be detrimental to the progress of technology.[136] One should not forget that the IPR policies of SSOs have a crucial role to play in the entire scheme of things involving standardization, and by creating an imbalance between the incentives flowing to the patent holders and implementers, they are inviting upon themselves the likelihood of some of the major contributors to technological innovation and standardization playing a subdued role in future standard-setting activities of the SSO, and in some cases, even considering diverting their technological contribution to standard-setting activities in other SSOs.

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[134] *See* Badin et al., *supra* note 115.

[135] Abbott, *supra* note 25. *See also* Badin et al., *supra* note 115.

[136] *See* Abbott, *supra* note 25.