



Development of innovative new standards jeopardised by IEEE patent policy

by
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Summary

In March 2015, IEEE significantly amended its patent policy in what was couched as an “update” but that seeks to significantly revise commitments from parties holding patent claims essential to IEEE standards to license those rights on reasonable and non-discriminatory (RAND) terms. Changes disallow patent holders from receiving any value attributable to the standards, require licensing at the smallest saleable patent practicing unit level, and deny these rights holders entitlement to seek an injunction against an unlicensed implementer until appellate review is exhausted. IEEE’s stated objective was to protect implementers from patent holdup, which was alleged without any substantiation.¹ IEEE is promoting, by reducing technology licensing costs, the short-term interests of certain implementers while undermining standard-essential patent values and the ability of SEP owners to receive adequate compensation, they are entitled to, from licensing their SEPs.

As I predicted in the IP Finance blog prior to the adoption of this controversial new patent policy,² and as indicated by others including senior government officials,³ the purported “clarification” is significantly jeopardising the IEEE Standards Association as a venue for development of open technology standards that include significant patented intellectual property. Large proportions of contributors to IEEE standards are now unwilling to provide “positive” Letters of Assurance (“LOAs”) under IEEE’s new patent policy.

In this paper, I have reviewed available data on LOAs and some third-party analysis of this. My conclusions are striking: almost three quarters (i.e. 73 percent) of LOAs for the IEEE flagship 802.11 WiFi standard, accepted by IEEE and posted on its website in the 18-month period to June 2017, are “negative” LOAs, indicating the submitter’s legitimate ex ante refusal to pledge RAND licensing under the new patent policy. Nearly half (i.e. 47 percent) of all accepted LOAs posted on the IEEE website over the same period are negative LOAs. More than one third (i.e. 42 percent) of companies portrayed as leaders with LOAs to IEEE standards are unwilling to pledge their SEPs under the new patent policy or have not provided LOAs when asked to do so.

The new patent policy has created a perverse situation among patent owners and implementers. In the absence of positive LOAs, implementers are left uncertain about which patent policy applies, if any, and about future ability to implement the standard. Therefore, implementers may be unclear whether many SEPs are subject to new licensing terms, the old licensing terms or are not subject to RAND licensing terms under any patent policy at all. This is unacceptable. Proponents of the new patent policy are also lamenting this lack of clarity, while trying to use this as a pretext to breach binding contractual agreements between IEEE and patent owners in previously-accepted LOAs.⁴

¹ IEEE-SA request for business review letter, November 7, 2014; http://www.gtassoc.com/answers/DOJ%20PDF/IEEEBRL2015/PatentHoldUpasRationaleIEEE_Bus_Review_Document_02_11072014.pdf

² Keith Mallinson: IEEE will jeopardise its attractiveness as venue for standards development if proposed new IP policies are adopted, February 6, 2015; <http://www.ip.finance/2015/02/ieee-will-jeopardise-its-attractiveness.html>

³ See e.g. Former Rep. Terry Lee, Don’t turn off Wi-Fi (January 8, 2015), available at <http://thehill.com/blogs/congress-blog/technology/228817-dont-turn-off-wi-fi>; Adam Mossoff, Reality Check: Weakening Wireless Technology Patents Hurts Everyone (RCR Wireless News, January 28, 2015) available at <http://www.rcrwireless.com/20150128/opinion/reality-check-weakening-wireless-technology-patents-hurts-everyone-tag10>; Leah Nylen and Lewis Crofts, EU Warns of Impact of IEEE’s Patent Policy Change (MLex, January 27, 2015); U.S. Senator Christopher Coons letter to U.S. Department of Justice (14 January 2015) available at <http://www.advancingengineering.org/christopher-coons>.

⁴ See March 2017 slides by Gil Ohana on behalf of Cisco at <http://grouper.ieee.org/groups/pp-dialog/email/pdf6eBTMFaO8V.pdf>, <http://grouper.ieee.org/groups/pp-dialog/email/msg00437.html> and comments in response at <http://grouper.ieee.org/groups/pp-dialog/email/msg00418.html>.

Chart 1: More than one third (10/24=42%) of companies IPlytics portrays as leaders with LOAs to IEEE standards are unwilling to pledge their SEPs under the new patent policy or have not provided LOAs when asked to do so

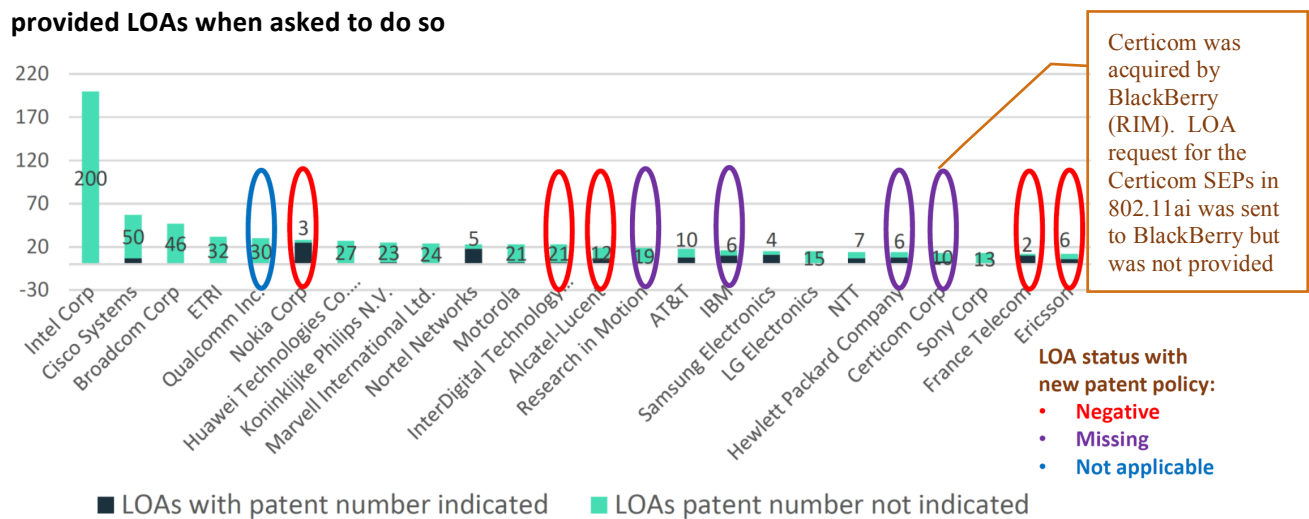


Figure 2: Number of blanket vs. specific LOAs submitted by all IEEE declaring companies for all IEEE standards (1992-2016)

Source: IPlytics empirical study report on patenting and standardisation activities at IEEE⁵ (black and green); WiseHarbor added Chart titles in bold black, identifiers and annotations in other colours.

Orange is the successor to France Telecom.

"Not applicable:" Positive blanket LOA accepted prior to March 2015 under previous patent policy.

Approvals for "standard-amendments" 802.11ah and 802.11ah deferred with policy impasse

There is deadlock between the two sides of this argument – largely, patent owners who seek adequate compensation from licensing their SEPs versus some implementers⁶ who would like to minimise their costs. Despite attempts by advocates of the new patent policy text to portray IEEE standardization work as continuing to proceed well, to the contrary, this is an illusion with unreconciled differences regarding applicable patent policy and LOAs. Previous attempts to significantly undermine rights of patent owners in other standard development organizations (SDOs) have failed: for example; with an intellectual property rights (IPR) policy change at ETSI in the 1990s that was abandoned before taking effect.

Unwillingness of SEP holders to pledge to the new patent policy are delaying standardization approval decisions. IEEE seeks to approve standards for which all known SEPs are pledged under the new patent policy with accepted IEEE LOA forms. But it is failing in this objective with an unprecedented high number of negative LOAs submitted and because LOAs requested from others are not forthcoming and should therefore be regarded as "missing." Negative LOAs that have been accepted by IEEE are, for example, with standard-amendments 802.11ai and 802.11ah. However, numerous other prospective negative LOAs have been rejected by IEEE because patent owners have sought to indicate – and IEEE has refused to allow – willingness to license on a basis other than the new patent policy, such as on the basis of the previous IEEE patent policy. With numerous known SEPs for which there are no licensing commitments, the above amendments to the 802.11 standard have only been "conditionally approve[d]" by the IEEE-SA's Standards Board.⁷

⁵ https://asoft20107.acrisoft.com/atrand/clientuploads/news/IPlytics_2017_Patenting%20and%20standardization%20activities%20at%20IEEE.pdf

⁶ This paper's author recognises that a large proportion of implementers are also patent owners.

⁷ <http://standards.ieee.org/about/sasb/1216sasbmin.pdf#page=22>

Conditional approvals are merely deferral tactics because there can be no reasonable expectation that the LOA conditions preventing full approval with the new patent policy will ever be met. Patent holders who have submitted negative LOAs are not going to change their minds and replace them with positive LOAs in the prevailing circumstances. Similarly, it seems very unlikely that those who acknowledge receipt of a request for an LOA but refuse to submit a positive LOA are likely to change their minds about doing so and submit a positive LOA. Deferring full approval until these two amendments are rolled up into the next version of the entire standard (i.e. 802.11/D10) amounts to “kicking the can down the road.”⁸

This impasse has occurred because many contributors to IEEE standards are, independently of each other, unwilling to pledge assurances under the new patent policy, which was established without consensus⁹ among a closed group of interested parties. The new patent policy text is purported to be a “clarification” of existing patent policy and not a new patent policy — begging the question why many of the new positive LOAs submitted merely restate previous LOAs already-submitted pursuant to the previous patent policy needed to be submitted at all. It is, instead, increasingly creating ambiguities and concerns that courts might interpret new conditions as mandatory. Many patent owners are unwilling to agree to the new patent policy because being bound by it could undermine their licensing businesses — including pre-existing agreements.

Adjusted LOA counts have reduced dramatically since introduction of new patent policy

The counts of submitted LOAs have been misleadingly presented to suggest that the new patent policy is having no overall adverse effect on licensing commitments. The numbers of accepted LOAs since the patent policy change have been inflated by a large proportion of “duplicate” LOAs (resubmissions of LOAs for standards for which there are already existing LOAs) that are not required by IEEE bylaws. Instead, after some well-justified adjustments to LOA counts for these and for negative LOAs and “missing” LOAs (in cases where IEEE sought from a disclosed essential patent holder, but did not receive, an accepted LOA), figures indicate that LOAs are dramatically and statistically significantly lower since the patent policy change. This indicates major adverse effects.

⁸ “Put off confronting a difficult issue or making an important decision, typically on a continuing basis.” Oxford Living Dictionaries.

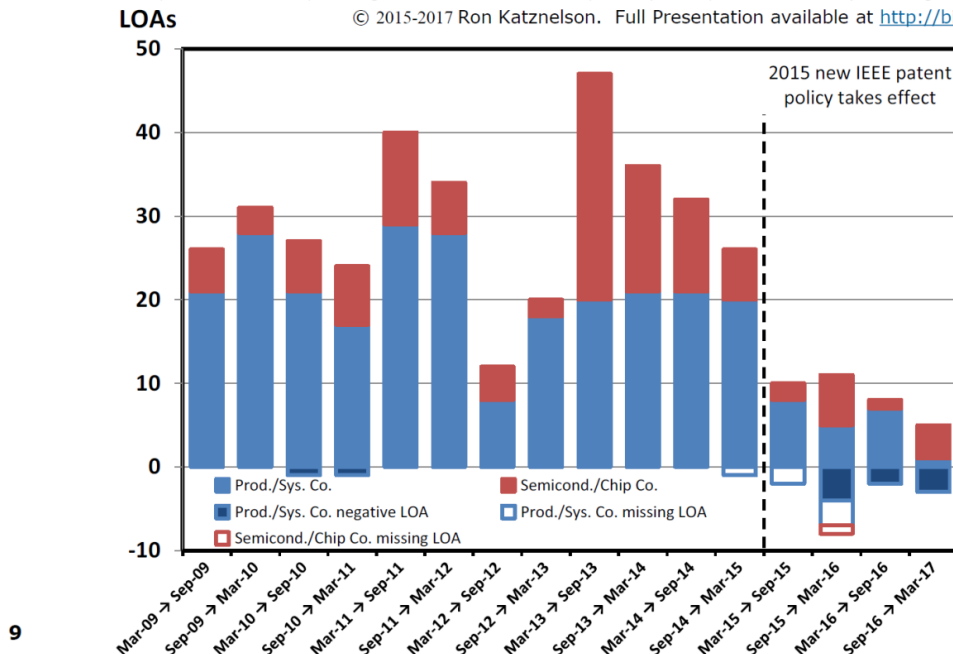
⁹ To mask it, in the fall of 2014, the IEEE-SA **removed** the most-prominent indication of its previously long-standing principles of consensus, due process and openness from its website. See comparative website snapshots <http://web.archive.org/web/20140723051820/http://standards.ieee.org/about/strategy.html> versus new page: <http://standards.ieee.org/about/strategy.html>.

Chart 2: Rejection of IEEE's new patent policy is indicated by dramatic fall in positive LOAs¹⁰

Decline in non-duplicate licensing Letters of Assurance for IEEE standards by entity type

Sources: LOA lists, IEEE-SA PatCom; Missing LOAs in: 802.15 minutes, 17-Sep-2015; 802.11 LOA Requests Register, 20-Jan-2017.

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Continuing activity in technical working groups, for now, is no assurance this will persist

Technical working group activity is continuing while participating companies wait to see if conflicts will be resolved so that new standards, as well as improvements and amendments to existing standards, will be approved. However, any suggestions that the continuing rate of Project Authorization Requests (PARs) — to commit IEEE-SA resources to new standard-development work — indicate that all is well in IEEE standardisation are phoney. Many IEEE projects do not include many, or even any, patented technologies: so, these might be unaffected by difficulties with the new patent policy. The standards that provide significant innovative value beyond compatibility are rich in patented technologies. LOAs identify these patents, their ownership, and the basis upon which they can be licensed. For those standardisation projects that include significant patented technologies, it is what is occurring with LOAs, rather than PARs, that spells trouble.

It could be several years before it is evident how much IEEE standardisation has been harmed. For example, clarity (to implementers, in particular) could be rapidly restored by allowing patent owners optionally to indicate their willingness to license based on the old patent policy. Meanwhile, IEEE standardisation work including supporting R&D and product implementation will suffer as participants consider switching to other SDOs. By then it could be too late to fix things.

¹⁰ Standard Essential Patents — the empirical record since adoption. Symposium on Antitrust, Standard Essential Patents, and the Fallacy of the Anticommons Tragedy, Berkeley, CA. October 29, 2016. [Updated March, 2017] Ron D. Katznelson, Ph.D.* <http://bit.ly/IEEE-LOAs>

1. IEEE's new patent policy is much more restrictive

In March 2015, IEEE significantly amended its patent policy in an “update” that seeks to significantly revise commitments from parties holding patent claims essential to IEEE standards to license those rights on reasonable and non-discriminatory (RAND) terms that exclude any value attributable to the standard, require licensing at the smallest saleable patent practicing unit level, and deny these rights holders entitlement to seek an injunction against an unlicensed implementer until appellate review is exhausted. IEEE's stated objective was to protect implementers from patent holdup, which was alleged without substantiation. What it really wants is to undermine standard-essential patent values and the ability of SEP owners to receive adequate compensation from licensing their SEPs.¹¹

In the face of significant resistance, and via a highly controversial and secretive process¹², the new patent policy significantly restricted flexibility in the RAND commitment with the following conditions:

- SEP holders must waive their rights to seek any injunctions until they have successfully litigated claims against unlicensed implementers to conclusion in a court of appeals;
- Royalty charges “should” be calculated based on the “smallest saleable” implementation of any portion of the standard and comport with a reasonable aggregate royalty burden of the relevant standard;
- Only licenses for which SEP holders have relinquished the right to seek, enforce, or even threaten, an injunction can qualify as “comparable licenses” for determining RAND royalties; and
- Reciprocal cross-licensing cannot be required, except for patents reading on the same standard.

The “update” also obliges patent holders to be bound by the IEEE RAND commitment to license their patent to any “Compliant Implementation,” meaning that a patent holder making such a commitment cannot opt to license its patents for using the IEEE standards at certain levels of production.¹³ Some implementers are hoping to force licensing costs down by insisting on licensing at the chip level instead of the device level. All the above constraints are counter to most common industry practices established over many years of licensing SEPs reading on standards developed by IEEE and many other SDOs.

As noted by Greg Sidak of Criterion Economics, the patent policy changes ‘purport to mitigate the risk of patent holdup and royalty stacking—theoretically and empirically disputed conjectures, which postulate that SEP holders routinely extract supracompetitive royalties from the implementers of a standard. In fact, the [patent policy changes] broaden the binding provisions of the IEEE's FRAND

¹¹ The extent of the revisions can be seen in the following redline: http://grouper.ieee.org/groups/pp-dialog/drafts_comments/SBBylaws_100614_redline_current.pdf.

¹² See George Willingmyre, Giving Process Its Due When an SDO Changes Rules Of The Game (January 2017) available at <https://www.ip-watch.org/2017/01/22/giving-process-due-standard-development-organization-changes-rules-game/> and also as SSRN Working Paper No. 2903602 (23 January, 2017) available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2903602.

¹³ The IEEE RAND Commitment obligates a patent holder to make available a license “to make, have made, sell, offer to sell, or import and Compliant Implementation that practices the Essential Patent Claim for use in conforming with the IEEE Standard.” Compliant Implementation is defined 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.”

commitment, diminish the SEP holder's ability to enforce its patent rights, and unambiguously lower the royalties that the SEP holder may charge a licensee.¹⁴

While SDOs have significant latitude in making patent policy changes, IEEE has done this with disregard for the open and consensus-based principles that all SDOs usually follow. As also noted by Greg Sidak, '[o]ne would expect the process whereby an SSO amends its bylaws to be consensus-driven and supported by no lesser protections than those that safeguard its standard setting. Yet, scrutiny of the process by which the IEEE amended its bylaws in 2015 reveals that there was ex ante intense dissent among a discrete subset of members of the Standards Board, and there were ex post declarations by those same members that they would not adhere to certain new pricing rules embedded in the bylaw amendments. Those members asserted that the process by which the IEEE amended its patent policy did not comply with the principles of openness, consensus, balance, due process, and right to appeal that are consistent with the IEEE's standard-setting process. The 2015 bylaw amendments deviated from the safeguards that the IEEE had guaranteed its members in both the foundational documents of the IEEE and its history of consensus-driven policymaking.'¹⁵

There are numerous pitfalls for patent licensors. For example, if a SEP holder pledges new RAND commitments in compliance with the new patent policy, it will in many cases be offering more favourable license terms than those already granted under legacy RAND agreements for the same SEPs. The SEP holder is therefore at risk of being deemed to be discriminating against the legacy implementers, in violation of its commitments to license under non-discriminatory terms. This could expose numerous pre-existing licenses to legal challenges.

Even proponents of the new policy are also lamenting this lack of clarity, while trying to use this as a pretext to breach binding contractual agreements made between IEEE and patent owners in previously-accepted LOAs.¹⁶ IEEE cannot impose changes to pre-existing contracts between IEEE and patent owners without their consent, which would not be forthcoming in most cases.

2. Adverse precedents in other SDOs with widespread resistance to patent policy changes

History does not bode well for the longevity of this change to IEEE's patent policy. According to research by Ron Katznelson, '[s]ince 2012, responding to pressures from various standards implementers, the International Telecommunication Union (ITU) and the European Telecommunications Standards Institute (ETSI) have considered amending their patent policies to define the meaning of FRAND. However, intellectual property rights committees of ITU and ETSI declined to adopt such amendments, perhaps because no evidence of purported patent "holdup" was ever produced. This was not the first occasion that ETSI had entertained further definition of FRAND. Such proposed amendments were made in 1993, 2003, and 2006; they were intensely controversial within ETSI, and ultimately did not survive. Since 2007, ETSI Guide on IPRs specifically disclaims any more specific definition of FRAND, stating instead that "such commercial terms are a matter for discussion between the IPR holder and the potential licensee, outside of ETSI," and that "[s]pecific licensing terms and negotiations are commercial issues between the companies and shall not be addressed within ETSI." Most other SDOs have similar disclaimers.' (Citations omitted).¹⁷

¹⁴ <https://www.criterioneconomics.com/docs/antitrust-divisions-devaluation-of-standard-essential-patents.pdf>

¹⁵ <https://www.criterioneconomics.com/docs/bias-to-suppress-royalties-for-standard-essential-patents.pdf>

¹⁶ See supra note 5 March 2017 slides by Cisco at <http://grouper.ieee.org/groups/pp-dialog/email/pdf6eBTMFaQ8V.pdf>, <http://grouper.ieee.org/groups/pp-dialog/email/msg00437.html> and comments in response at <http://grouper.ieee.org/groups/pp-dialog/email/msg00418.html>.

¹⁷ Ron D. Katznelson, "Perilous Deviation from FRAND Harmony – Operational Pitfalls of the 2015 IEEE Patent

Resistance to IEEE patent policy changes has been strong and sustained since the outset. By April 2015, Nokia, Ericsson, and Qualcomm each had stated publicly their unwillingness to license their technologies essential to the IEEE's 802.11 (i.e. WiFi) standard under what they regarded as new patent policy rules, and InterDigital had written to IEEE-SA indicating its similar unwillingness.¹⁸ In addition, Alcatel-Lucent (now owned by Nokia), Blackberry, IBM, Nokia Siemens Networks (a wholly owned subsidiary of Nokia), Orange, Panasonic, SanDisk, Fraunhofer, General Electric and Huawei have also opposed what they generally regard as patent policy revisions.¹⁹ Most of the above firms hold significant SEP portfolios including those reading on IEEE and other SDOs' standards, and some generate appreciable net royalty revenues through licensing such portfolios.

3. LOAs indicate significant unwillingness to grant licenses on basis of updated patent policy

Resistance to the new patent policy among SEP owners is illustrated by the rising flood of negative LOAs. This has become increasingly apparent after some SEP owners have waited for development of new standards or amendments such as 802.11ah and 802.11ai before submitting new LOAs. Some SEP owners justifiably believe that LOAs accepted before March 2015 remain subject to the previous patent policy and have not yet felt it necessary to submit new LOAs for a previously approved standard or for previously declared patents (including blanket declarations).

[Since March 2015, many negative LOA submissions have been rejected by IEEE for not being compliant with its LOA form. These rejected submissions are not visible publicly online in the IEEE standards database. IEEE has routinely and pedantically rejected negative LOA forms that have included additional text, attachments, or URLs indicating willingness to license on alternative terms, such as in accordance with the previous patent policy.

However, once purged of this useful information, negative LOAs have been accepted by IEEE and posted on its web site. Additional accepted LOAs will likely follow when more SEP owners recognise the futility of trying to indicate willingness to license on an alternative basis and instead submit to IEEE's restrictive form-filing requirements. In the 18 months from 1st January 2016 to 30th June 2017, 32 LOAs were accepted and listed on IEEE's online database. Nearly half of those – i.e. 47 percent or 15 of them – were negative LOAs, indicating the submitter's refusal to pledge RAND licensing under the new patent policy.]

Policy," *IEEE SIIT 2015, 9th Int'l. Conf. on Standardization and Innovation in Information Technology*, Sunnyvale, CA. (Oct-8-2015) (Available at <http://bit.ly/IEEE-SIIT-2015>).

¹⁸ As noted by Greg Sidak, "See, e.g., Susan Decker & Ian King, *Qualcomm Says It Won't Follow New Wi-Fi Rules on Patents*, Bloomberg (Feb. 11, 2015, 11:23 AM), <http://www.bloomberg.com/news/articles/2015-02-11/qualcomm-says-new-wi-fi-standard-rules-unfair-may-not-take-part>; Richard Lloyd, *Ericsson and Nokia the Latest To Confirm That They Will Not License Under the New IEEE Patent Policy*, IAM (Apr. 10, 2015), <http://www.iam-media.com/blog/detail.aspx?g=d07d0bde-ebd6-495a-aa72-4eecb9dac67d>; Letter from Lawrence F. Shay, Exec. Vice President of Intellectual Prop., InterDigital, Inc., to David Law, Pa-tent Comm. Chair, IEEE-SA Standards Bd. (Mar. 24, 2015), available at <http://wpuploads.interdigital.com.s3.amazonaws.com/uploads/2015/03/Letter-to-IEEE-SA-PatCom.pdf>."

¹⁹ Standard Essential Patents – the empirical record since adoption. Symposium on Antitrust, Standard Essential Patents, and the Fallacy of the Anticommons Tragedy, Berkeley, CA. October 29, 2016. [Updated March, 2017] Ron D. Katznelson, Ph.D.* <http://bit.ly/IEEE-LOAs>

**Chart 3: LOAs accepted by IEEE during the 18-month period from 1st January 2016 to 30th June 2017
(--- 802.11 standard; --- *non-802.11 standard*)**

	Standard	Submitter	Letter Type	Date	Link to LOA
1.	802.11af	Nokia	Negative	13 January 2016	https://standards.ieee.org/about/sasb/patcom/negative-loa-802_11af-nokia-13Jan2016.pdf
2.	802.11ad	Nokia	Negative	13 January 2016	https://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ad-nokia-13Jan2016.pdf
3.	802.11br	Wolfram Kress	2 patents	3 February 2016	http://standards.ieee.org/about/sasb/patcom/loa-802_3br-kress-03Feb2016.pdf
4.	802.16.1	Nokia	Negative	18 March 2016	https://standards.ieee.org/about/sasb/patcom/negative-loa-802_16_1-nokia-18Mar2016.pdf
5.	802.11n	Nokia	Negative	18 March 201	https://standards.ieee.org/about/sasb/patcom/negative-loa-802_11n-nokia-18Mar2016.pdf
6.	802.11ai	Microsoft	4 patents	12 April 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_11ai-ms-12Apr2016.pdf
7.	802.16s	Full Spectrum Inc.	3 patents	25 July 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_16s-fullspectrum-25Jul2016.pdf
8.	802.3	Nextek Power Systems, Inc.	9 patents	29 July 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_3-nextek-24Jul2016.pdf
9.	802.21	ETRI	Blanket	3 August 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_21-etri-03Aug2016.pdf
10.	802.21.1	ETRI	Blanket	3 August 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_21_1-etri-03Aug2016.pdf
11.	802.11ax	ETRI	Blanket	23 August 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_11ax-etri-23Aug2016.pdf
12.	802.15.3e	ETRI	Blanket	24 August 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_15_3e-etri-24Aug2016.pdf
13.	802.3cb	Marvell Semiconductor	Blanket	26 August 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_3cb-marvell-26Aug2016.pdf
14.	802.11ah	Ericsson	Negative	27 September, 2016	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ah-ericsson-27Sep2016.pdf
15.	802.11ax	Ericsson	Negative	27 September, 2016	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ax-ericsson-27Sep2016.pdf
16.	802.3	ADTRAN, Inc.	Blanket	5 October, 2016	http://standards.ieee.org/about/sasb/patcom/loa-802_3-adtran-05Oct2016.pdf
17.	802.11ah	Nokia	Negative	7 October, 2016	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ah-nokia-07Oct2016.pdf
18.	802.11ai	Nokia	Negative	7 October, 2016	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ai-nokia-07Oct2016.pdf

19.	802.11az	IHP GmbH	1 patent	10 November, 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_11az-IHP-10Nov2016.pdf
20.	802.3bw	Microchip	Blanket	18 November, 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_3bw-microchip-18Nov2016.pdf
21.	802.3bp	Microchip	Blanket	18 November, 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_3bp-microchip-18Nov2016.pdf
22.	1838	Mentor Graphics	2 patents	31 January, 2017	https://standards.ieee.org/about/sasb/patcom/loa-1838-mentor-31Jan2017.pdf
23.	802.3bu	Broadcom	Blanket	28 February, 2017	https://standards.ieee.org/about/sasb/patcom/loa-802_3bu-broadcom-28Feb2017.pdf
24.	802.11ax	KAIST		3 March 2017	https://standards.ieee.org/about/sasb/patcom/loa-802_11ax-KAIST-03Mar2017.pdf
25.	802ax.11ax	InterDigital	Negative	15 March 2017	http://standards.ieee.org/about/sasb/patcom/neg-loa-802_11ax-IPH-15Mar2017.pdf
26.	C57.147 and C57.155	Cooper Power Systems	3 patents RF	5 April 2017	https://standards.ieee.org/about/sasb/patcom/loa_c57-155_05Apr2017.pdf
27.	C57.147 and C57.155	Cooper Power Systems	Negative	5 April 2017	https://standards.ieee.org/about/sasb/patcom/neg-loa_c57-155_05Apr2017.pdf
28.	802.11n	Orange	Negative	19 May 2017	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11n-orange-part1-19May2017.pdf
29.	802.11n	Orange	Negative	19 May 2017	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11n-orange-part2-19May2017.pdf
30.	1901	Orange	Negative	13 June 2017	https://standards.ieee.org/about/sasb/patcom/negative-loa-1901-orange-part1-13Jun2017.pdf
31.	1901	Orange	Negative	13 June 2017	https://standards.ieee.org/about/sasb/patcom/negative-loa-1901-orange-part2-13Jun2017.pdf
32.	802.11ad	Nokia	Negative	20 June 2017	https://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ad-nokia-20Jun2017.pdf

If one focuses on the 802.11 WiFi standard, almost three quarters (i.e. 11 of a total of 15 - or 73 percent) of the LOAs accepted over the same period were negative LOAs. Ericsson's and InterDigital's are blanket LOAs, so their refusal to grant RAND licenses under the new policy could relate to dozens if not hundreds of patents.

Chart 4: LOAs accepted by IEEE in the 18-month period from 1st January 2016 to 30th June 2017 (--- 802.11 standard only)

	Standard	Submitter	Letter Type	Date	Link to LOA
1.	802.11af	Nokia	Negative	13 January 2016	https://standards.ieee.org/about/sasb/patcom/negative-loa-802_11af-nokia-13Jan2016.pdf
2.	802.11ad	Nokia	Negative	13 January 2016	https://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ad-nokia-13Jan2016.pdf
3.	802.11n	Nokia	Negative	18 March 2016	https://standards.ieee.org/about/sasb/patcom/negative-loa-802_11n-nokia-18Mar2016.pdf
4.	802.11ai	Microsoft	4 patents	12 April 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_11ai-ms-12Apr2016.pdf
5.	802.11ax	ETRI	Blanket	23 August 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_11ax-etri-23Aug2016.pdf
6.	802.11ah	Ericsson	Negative	27 September 2016	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ah-ericsson-27Sep2016.pdf
7.	802.11ax	Ericsson	Negative	27 September 2016	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ax-ericsson-27Sep2016.pdf
8.	802.11ah	Nokia	Negative	7 October 2016	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ah-nokia-07Oct2016.pdf
9.	802.11ai	Nokia	Negative	7 October 2016	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ai-nokia-07Oct2016.pdf
10.	802.11az	IHP GmbH	1 patent	10 November 2016	https://standards.ieee.org/about/sasb/patcom/loa-802_11az-IHP-10Nov2016.pdf
11.	802.11ax	KAIST	Blanket	3 March 2017	https://standards.ieee.org/about/sasb/patcom/loa-802_11ax-KAIST-03Mar2017.pdf
12.	802.11ax	InterDigital	Negative	15 March 2017	http://standards.ieee.org/about/sasb/patcom/neg-loa-802_11ax-IPH-15Mar2017.pdf
13.	802.11n	Orange	Negative	19 May 2017	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11n-orange-part1-19May2017.pdf
14.	802.11n	Orange	Negative	19 May 2017	http://standards.ieee.org/about/sasb/patcom/negative-loa-802_11n-orange-part2-19May2017.pdf
15.	802.11ad	Nokia	Negative	20 June 2017	https://standards.ieee.org/about/sasb/patcom/negative-loa-802_11ad-nokia-20Jun2017.pdf

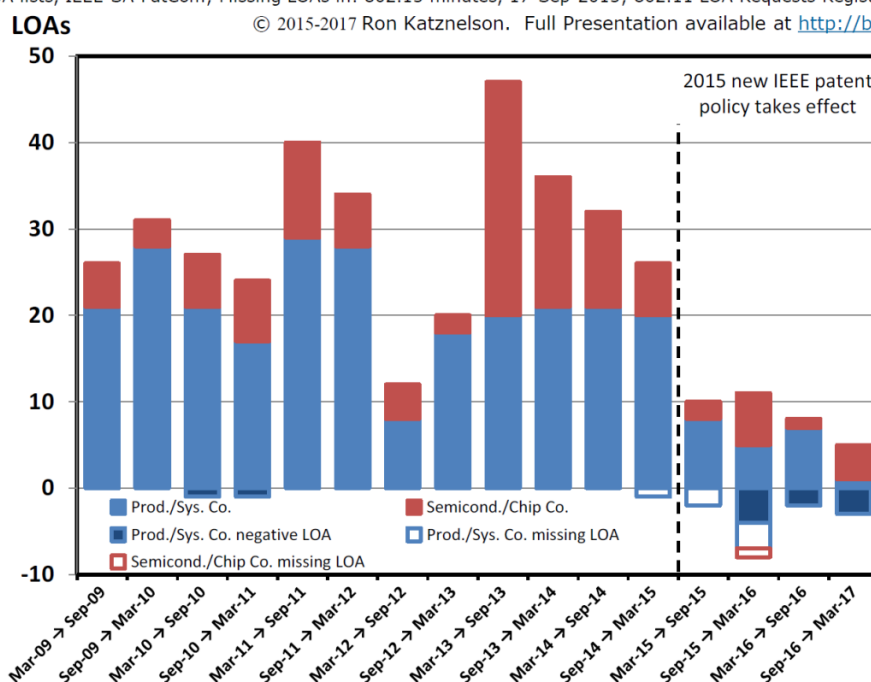
Furthermore, after making legitimate adjustments to the counts of LOAs, there has been a statistically significant reduction in total LOAs ever since introduction of the new patent policy in March 2015. This is revealed in analysis to March 2017 by Ron Katznelson. His summary results appear in the following two charts.

Chart 5: Unwillingness to accept IEEE's new patent policy is indicated by dramatic fall in adjusted LOA counts

Decline in non-duplicate licensing Letters of Assurance for IEEE standards by entity type

Sources: LOA lists, IEEE-SA PatCom; Missing LOAs in: 802.15 minutes, 17-Sep-2015; 802.11 LOA Requests Register, 20-Jan-2017.

© 2015-2017 Ron Katznelson. Full Presentation available at <http://bit.ly/IEEE-LOAs>



Source: Ron Katznelson²⁰

In this analysis, negative LOAs — there were very few of them before introduction of the new patent policy; and they are commonplace thereafter— are counted negatively. “Missing” LOAs — in cases where IEEE sought from a disclosed essential patent holder, but did not receive, an accepted LOA as of March 15, 2017— are also counted negatively. This analysis does not count “duplicate” LOAs that are LOA restatements for which a specific or blanket LOA on a patent or a pending patent application was previously accepted from the same patent holder. More than 100 of these blanket LOAs are from Intel: they were not required by IEEE; but they misleadingly inflate the count of LOAs substantially if included. Also, as discussed below, their necessity is questionable given the assertion that the new patent policy is not a new policy but a mere clarification.

According to advocates of the new patent policy, including IEEE external counsel Michael Lindsay, its purpose is, ostensibly, to provide more “clarity”.²¹ If it is only clarification and not outright patent policy change, there is no good reason to submit new blanket LOAs for each of numerous amendments to standards such as 802.11.²² The updated patent policy certainly reads like a patent

²⁰ Standard Essential Patents – the empirical record since adoption. Symposium on Antitrust, Standard Essential Patents, and the Fallacy of the Anticommons Tragedy, Berkeley, CA. October 29, 2016. [Updated March, 2017] Ron D. Katznelson, Ph.D.* <http://bit.ly/IEEE-LOAs>

²¹ <https://www.ip-watch.org/2016/03/03/ieee-patent-policy-changes-seek-to-put-brakes-on-surging-litigation/>

²² For example, with the new patent policy, Intel has inflated the total number of blanket LOAs, including those it has submitted for 802.11, which are more than double any other company. It has done this by submitting separate blanket LOAs for amendments, corrigenda (corrections to printing errors), editions, or revisions to this existing IEEE Standard for

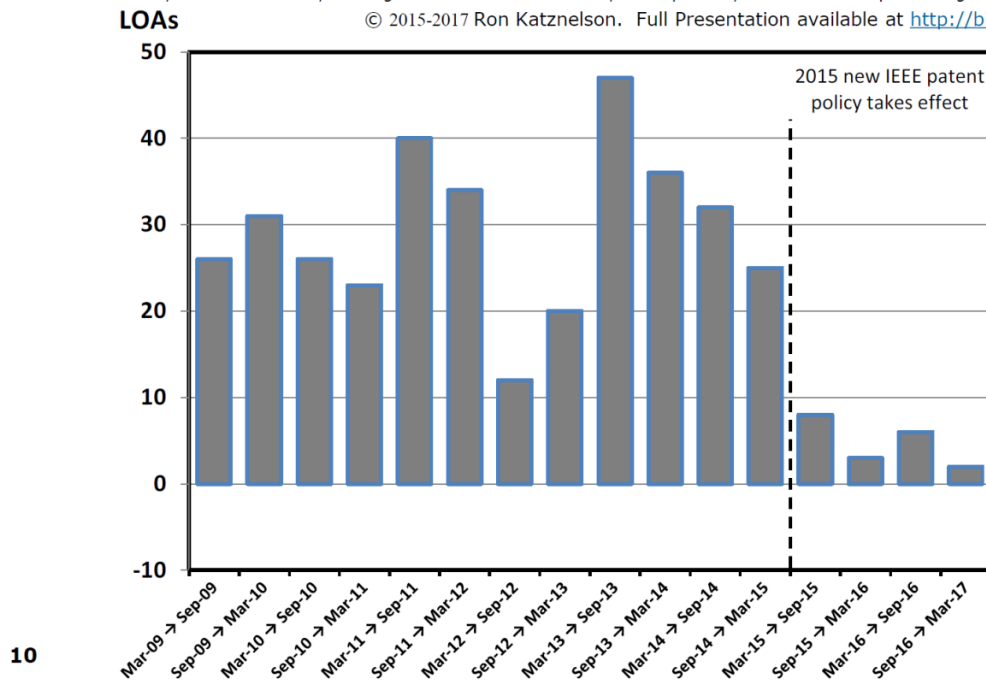
policy change to me, as presumably it would to most 10-year olds, and the “redline” comparing the two shows that more than half of the text has changed.²³ However, Intel cannot have it both ways by submitting new blanket LOAs to boost the number of “positive LOAs” as if it is a patent policy change while also maintaining that it is only a clarification of existing patent policy.

Chart 6: Unwillingness to accept IEEE’s new patent policy is indicated by dramatic reduction in adjusted LOA counts

Decline in non-duplicate licensing Letters of Assurance for IEEE standards (Netting out negative and missing LOAs)

Sources: LOA lists, IEEE-SA PatCom; Missing LOAs in: 802.15 minutes, 17-Sep-2015; 802.11 LOA Requests Register, 20-Jan-2017.

© 2015-2017 Ron Katznelson. Full Presentation available at <http://bit.ly/IEEE-LOAs>



Source: Ron Katznelson

The statistical significance of these results is very high, as indicated in the Annex.

which it had already submitted LOAs before March 2015 (e.g. for 802.11aa, 802.11ac, 802.11ad, 802.11af, 802.11ah, 802.11ai, 802.11k, 802.11n, 802.11n, 802.11r, 802.11s, 802.11u, 802.11v, 802.11w, 802.11y, 802.11z). It has also pursued this tactic with other IEEE standards.

²³ A redline compare version of the new policy to the previous one is available at http://grouper.ieee.org/groups/pp-dialog/drafts_comments/SBBylaws_100614_redline_current.pdf

4. Analysis based on IPlytics figures reveals that large proportions of patents and patent owners are not pledged to the new patent policy

IPlytics was commissioned by Intel to produce a report on patenting and standardization at IEEE including LOAs.²⁴ It includes many charts showing numbers of LOAs, patents, and patent families by company and by year. I have reproduced several of these with my addition of some identifiers and annotations quantifying where LOAs, patents, and patent owners are not pledged to the new patent policy and where LOA counts have been substantially inflated (i.e. by Intel's numerous blanket LOA submissions following the patent policy change in 2015).

Charts 7 to 12 are copies of IPlytics report figures 2, 4, 6, 7, 9 and 10 (comprising only black and green colouring), to which I have added emboldened red, purple, blue and brown identifiers and annotations.

Chart 7: More than one third (10/24=42%) of companies IPlytics portrays as leaders with LOAs to IEEE standards are unwilling to pledge their SEPs under the new patent policy or have not provided LOAs when asked to do so

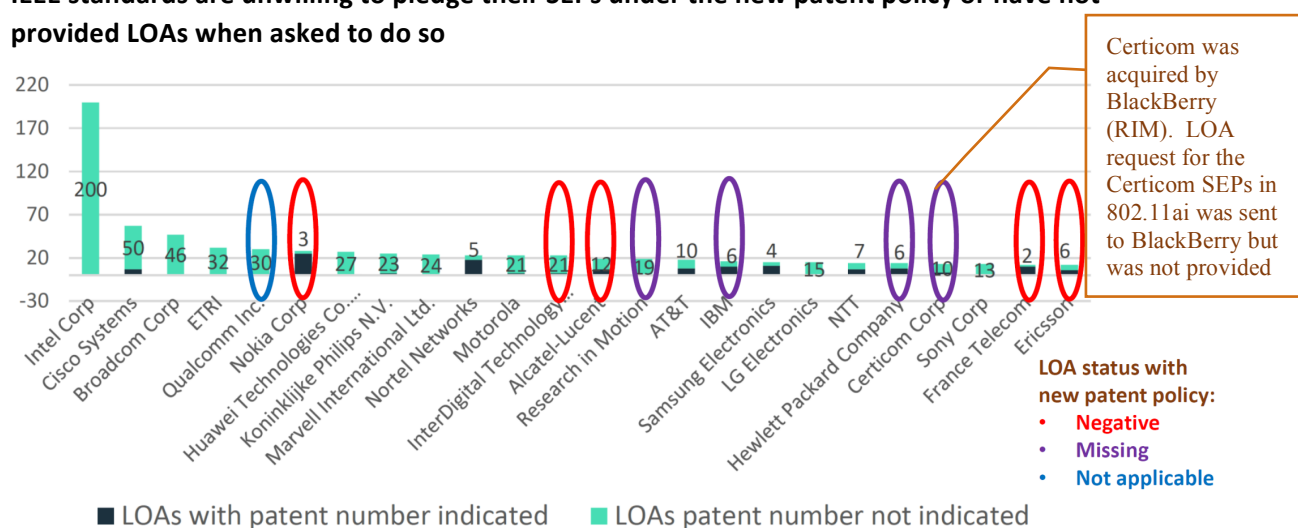


Figure 2: Number of blanket vs. specific LOAs submitted by all IEEE declaring companies for all IEEE standards (1992-2016)

Source: IPlytics empirical study report on patenting and standardisation activities at IEEE²⁵ (black and green); WiseHarbor added Chart titles in bold black, identifiers and annotations in other colours.

Orange is the successor to France Telecom.

"Not applicable:" Positive blanket LOA accepted prior to March 2015 under previous patent policy.

²⁴ Empirical study on patenting and standardization activities at IEEE, Dr. Tim Pohlmann IPlytics GmbH - March 2017 - https://asoft20107.acrisoft.com/atfrand/clientuploads/news/IPlytics_2017_Patenting%20and%20standardization%20activities%20at%20IEEE.pdf

²⁵ https://asoft20107.acrisoft.com/atfrand/clientuploads/news/IPlytics_2017_Patenting%20and%20standardization%20activities%20at%20IEEE.pdf

Chart 8: Around one third (6/19=32%) of companies IPlytics portrays as top-20 with blanket LOAs for 802.11 are not agreeing to the new patent policy

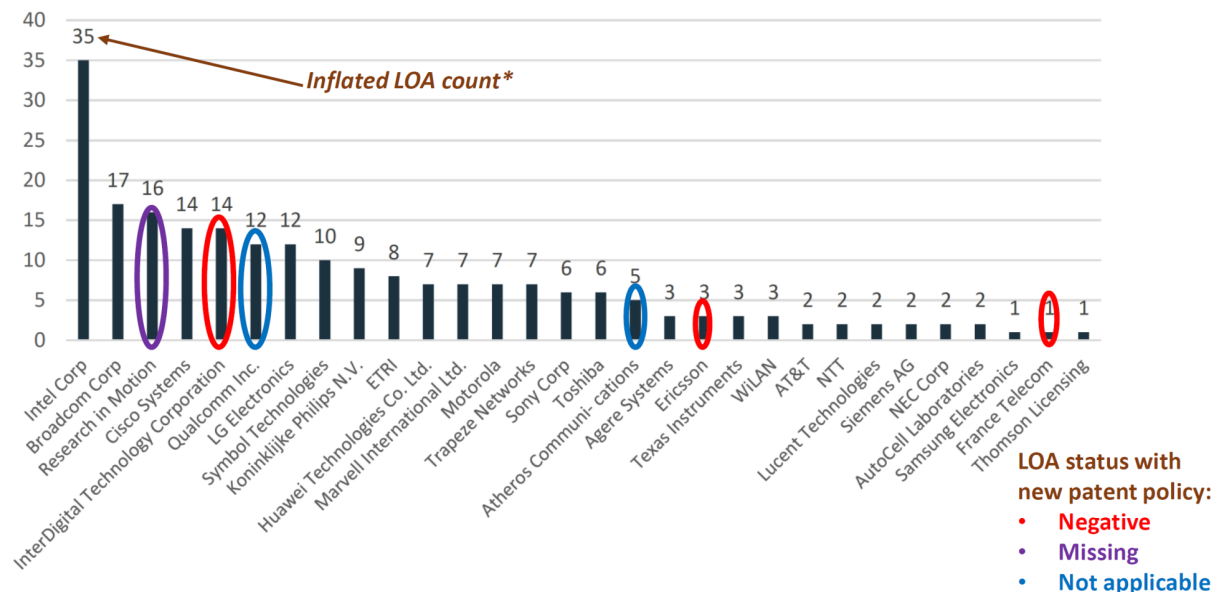


Figure 4: Number of submitted blanket LOAs for the IEEE 802.11 (1992-2016)

*With the new patent policy, Intel has inflated the total number of blanket LOAs, including those it has submitted for 802.11, which are more than double any other company. It has done this by submitting separate blanket LoAs for amendments, corrigenda (corrections to printing errors), editions, or revisions to this existing IEEE Standard for which it had already submitted LOAs before March 2015 (e.g. for 802.11aa, 802.11ac, 802.11ad, 802.11af, 802.11ah, 802.11ai, 802.11k, 802.11n, 802.11r, 802.11s, 802.11u, 802.11v, 802.11w, 802.11y, 802.11z). Intel has also pursued this tactic with other IEEE standards.

Chart 9: Approximately one quarter of essential patents and essential patent families referencing the 802.11 standard were filed by companies not agreeing to the new patent policy

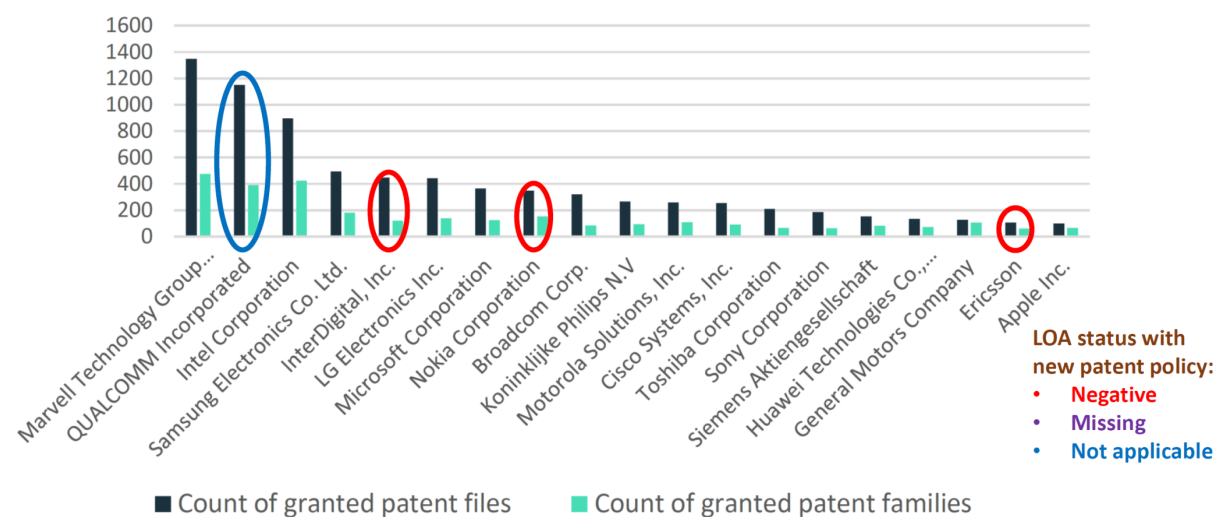


Figure 6: Number of EP patents and patent families that reference the IEEE 802.11 standard (1992-2016)

Chart 10: More than one quarter of specifically-declared SEPs and SEP families for the 802.11 standard were filed by companies not agreeing to the new patent policy

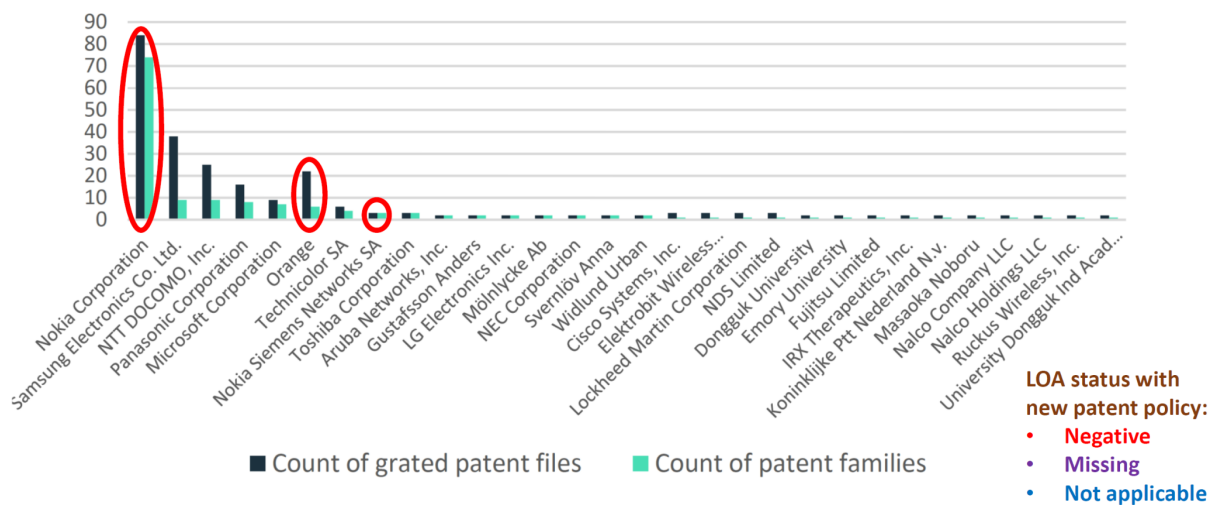


Figure 7: Number of specific declared SEPs and SEP families for the IEEE 802.11 standard (1992-2016)
Panasonic has also opposed the IEEE's new patent policy.

Chart 11: The companies filing LOAs with patent number included are overwhelmingly those who are filing negative LOAs or have publicly opposed IEEE's new patent policy

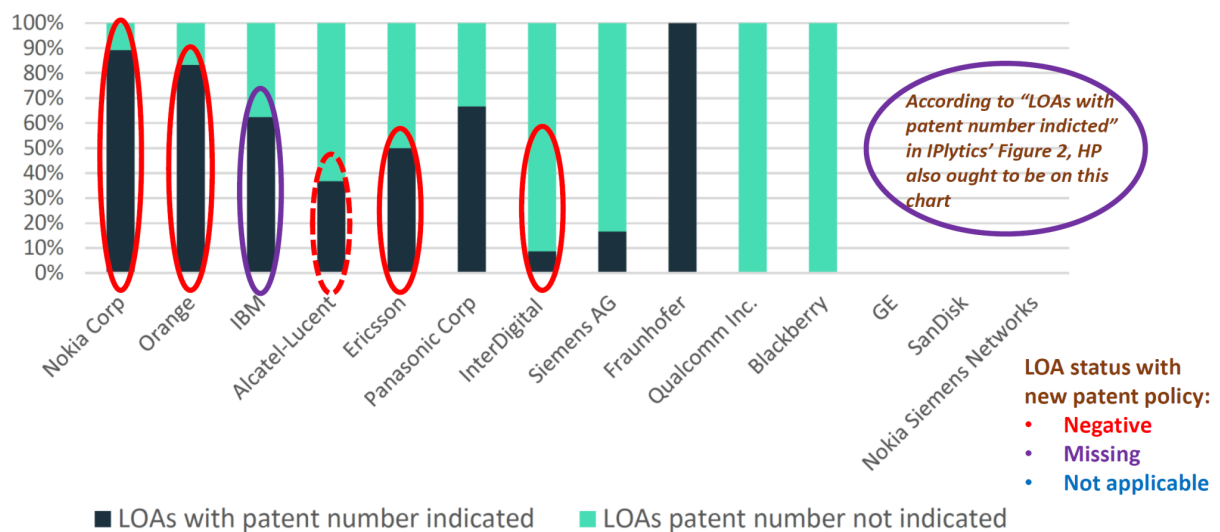


Figure 9: Share of blanket vs. specific LOAs submitted to IEEE (1992-2016)
Nokia completed its acquisition of Alcatel-Lucent in 2016. Panasonic and Fraunhofer have also opposed IEEE's new patent policy.

As indicated previously and illustrated again below, it is blanket LOAs, not specific declarations, that are inflated. The IPlytics report might be correct in stating that "specific declarations must be updated each time a new essential patent is identified even as to the same standard, whereas blanket declarations do not need such updating for the same standard or, in some cases, even for amendments thereto" (emphasis added), but IPlytics incorrectly infers from this that "it is not surprising that a preference for specific patent declarations could lead to an inflated LOA count."

To the contrary:

- LOAs are missing from IBM and HP, who have previously submitted specific declarations, indicating unwillingness to license based on the new patent policy.
- It is Intel —favouring the new patent policy —that has flooded and inflated LOA submissions with blanket LOAs that are unnecessary (as IPlytics correctly notes).
- Intel’s blanket LOAs alone represented three quarters of all LOAs accepted in 2015.

Chart 12: Intel accounted for three quarters of LOAs submitted in 2015: It massively inflated the total with more than 100 blanket LOAs out of a total of 138 LOAs that year

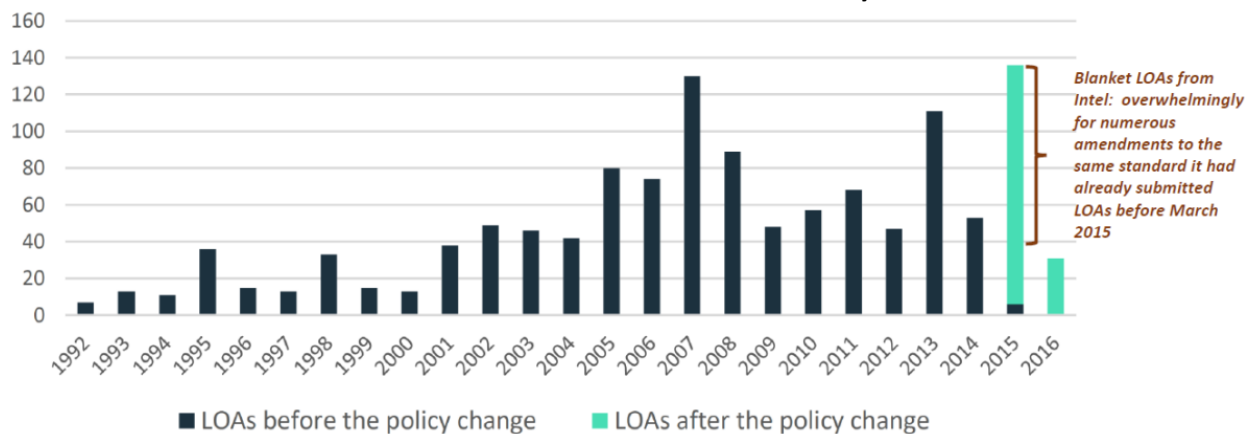


Figure 10: Number of submitted LOAs over time as of declared before and after the IEEE IP policy change (1992-2016)

The IPlytics report misses the point about SEP declaration rate trends. According to IPlytics, ‘even accepting that LOAs were down somewhat at IEEE in 2016, there are reasons to think that “LOA counting” is not a particularly meaningful methodology for evaluating the health of an SSO. For example, at ETSI – which has been cited as an example of a healthy and successful SSO – both IPR Declarations and the number of declared patent families were down significantly in 2015 and 2016 compared to each of the two prior years.’ Instead of all that with the significant temporal ebbs and flows in SDO activity, together with corresponding rates of patenting and overwhelmingly positive pledges to ETSI’s IPR policy, the issue at IEEE is numerous negative and missing LOAs with many companies and declarations no longer explicitly pledged to any patent policy.

In standards development at IEEE:

- Negative LOAs allow no alternative patent policy to apply and do not allow for procompetitive ex ante disclosure of any licensing terms;
- Missing LOAs can prevent approval of the standard or amendments to it and are already postponing approval of 802.11ai and 802.ah with “conditional approval,” which is a fudge and playing for time;
- Status of some LOAs (positive and negative) and applicable patent policy has become indeterminate since introduction of the new patent policy;

- Missing and negative LOAs threaten future implementation of IEEE Standards, including WiFi; and
- Much lower LOA counts (after eliminating inflationary LOA effects of duplicate LOAs and reflecting the nature of negative and missing LOAs) are a major symptom of problems arising from introduction of the new patent policy through a flawed non-consensus process; a policy that was not wanted by at least a large minority of SDO participants.

The situation is also problematic for accreditation of IEEE standards by other standards organizations, which is usually, for example, with the old patent policy, a routine matter. For example, ANSI requires that standards do not have negative or missing LOAs.²⁶ IEEE would not be able to justify under ANSI's Guidelines that it "reasonably believes the [802.11/D10 standard] meets the criteria of the ANSI [Patent Policy]."²⁷

5. Where do we go from here?

There is deadlock between those who embrace and those who reject IEEE's new patent policy. Any notion that all is well, for example because technical working groups are still active, is an illusion. The accumulating number of negative LOAs illustrates mounting conflicts, the unacceptable uncertainties (at least in the minds of implementers) around applicable patent policy or policies, and the increasing imperative for a patent policy change reversal. The outlook is:

1. **Logjam indefinitely.** Notwithstanding IEEE failing to meet its requirement that SEPs be pledged under accepted LOAs, new standards and amendments might or might not get adopted and implemented, or will do so more slowly. This will be a much more uncertain licensing environment than hitherto. Delays and probably significant litigation will occur before clarity and certainty is restored. The natural result of such a situation would be for IEEE standards to become less and less favoured, given that open access to them is increasingly no longer assured.

Or, a couple of ways out:

2. **Agree to differ.** Make optionality clear and explicit. RAND already encompasses the possibility of royalty free licensing for those patent owners who would like to license on that basis. With a new LOA form, patent owners could choose to license on the basis of (i) the old patent policy, (ii) new patent policy, or (iii) royalty-free terms; or
3. **Revert.** Reintroduce the previous patent policy.

There is a pressing existential threat to IEEE as a forum for development of high-quality open standards incorporating innovative and valuable patented technology. The ambiguities with LOAs and applicable patent policy are becoming increasingly apparent and problematic. The IEEE got into this dire predicament only because a collection of IEEE members pushed through major changes to the patent policy while suppressing the normal process of consensus, transparency, and openness that SDOs including IEEE routinely employ in selecting technologies to make the best standards.

²⁶ Guidelines for Implementation of the ANSI Patent Policy, 2016 p4;
<https://share.ansi.org/Shared%20Documents/Standards%20Activities/American%20National%20Standards/Procedures,%20Guides,%20and%20Forms/ANSI%20Patent%20Policy%20Guidelines%202016.pdf>

²⁷ Id. p4 p8;

Shame on IEEE for letting that happen; but it is not yet too late to make amends. IEEE must restore clarity and predictability to the terms upon which the vast majority of SEPs reading on its standards can be licensed from the vast majority of SEP owners. IEEE has developed numerous highly-successful standards that have not been impeded by patent licensing under previous arrangements. There is no reason why it should not resume doing that or something quite similar.

Nothing was broken before the patent policy change sought to fix things. For example, billions of people use WiFi at very modest costs. But that is a story that could take up another entire report.

Decline in LOA contributions to IEEE since the new patent policy came into effect is statistically significant in both entity types

Entity Category	All LOAs		Semicond./Chip Co. LOAs		Product/System Co. LOAs	
<i>Mann-Whitney Test for Two Independent Samples</i>						
Sample Period	Before Mar-15-2015	After Mar-15-2015	Before Mar-15-2015	After Mar-15-2015	Before Mar-15-2015	After Mar-15-2015
count	12	4	12	4	12	4
sample mean	29.3	4.8	8.58	3.00	20.75	1.75
change in sample mean		-84%		-65%		-92%
median	28.5	4.5	6	3	20.5	1.5
rank sum	126	10	119.5	16.5	126	10
U	0	48	7	42	0	48
<i>Rank Test Results</i>	one tail	two tail	one tail	two tail	one tail	two tail
alpha	0.05		0.05		0.05	
U	0		6.5		0	
mean	24		24		24	
std dev	8.24		8.23		8.21	
z-score	-2.91257		-2.12531		-2.92335	
U-crit	9.95	7.35	9.96	7.36	10.00	7.41
p-value	0.0018	0.0036	0.0168	0.0336	0.0017	0.0035
Statistically significant	yes	yes	yes	yes	yes	yes

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About this article and its author

This article was commissioned by 4iP Council²⁸ and written by Keith Mallinson of WiseHarbor.

Keith Mallinson is founder of WiseHarbor,²⁹ providing expert commercial consultancy since 2007 to technology and service businesses in wired and wireless telecommunications, media and entertainment serving consumer and professional markets. He is an industry expert and consultant with 25 years of experience and extensive knowledge of the ICT industries and markets, including the IP-rich 2G/3G/4G mobile communications sector. His clients include several major companies in ICT. He is often engaged as a testifying expert witness in patent licensing agreement disputes and in other litigation including asset valuations, damages assessments and in antitrust cases. He is also a regular columnist with RCR Wireless and IP Finance – “where money issues meet intellectual property rights.”

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²⁸ <http://www.4ipcouncil.com/>

²⁹ <http://www.wiseharbor.com/>