Written Testimony of The Institute of Electrical and Electronics Engineers, Incorporated (IEEE) Standards Association
before the
Subcommittee on Antitrust, Competition Policy and Consumer Rights of the Senate Committee on the Judiciary
entitled "Standards Essential Patent Disputes and Antitrust Law"
Tuesday, July 30, 2013
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Standards Development Organizations (SDOs) develop standards to address issues ranging from product compatibility to consumer safety and health. Standards also simplify product development and reduce costs that do not add value, thereby increasing a user's ability to compare competing products. Standards also are fundamental building blocks for international trade. Only through the use of standards can the requirements of interconnectivity and interoperability be assured and the credibility of new products and new markets verified, thereby enabling the rapid implementation of new technologies. Hundreds of nonprofit standards organizations throughout the U.S. have developed tens of thousands of standards.

Each SDO is governed by its own distinct set of rules and policies aimed at ensuring fair and open standards development processes. Some SDOs are free-standing entities, while others (like the IEEE Standards Association) operate as part of a larger organization with a broader mission. Some SDOs operate as industry groups, and others (like the IEEE Standards Association) operate as nonprofits with a broader mission.

IEEE and IEEE-SA

IEEE is a New York not-for-profit corporation, a 501 (c)(3) public charity, whose mission is to advance electrical engineering, electronics, and computer science, and the allied branches of

engineering and related arts and sciences for the benefit of humanity. It has more than 425,000 members in over 160 countries who are engineers, scientists, and other professionals whose technical interests are rooted in electrical and computer sciences, engineering, and related disciplines. It publishes nearly a third of the world's technical literature in the field, including more than 148 journals and magazines. IEEE also sponsors more than 1,300 technical conferences per year which are attended by over 400,000 professionals.

The IEEE Standards Association, known as IEEE-SA, is the standards development unit of IEEE. IEEE-SA has more than 1,400 standards and projects under development, including the prominent 802 standards for wireless networking. IEEE-SA is a central source of standardization in both traditional and emerging fields, particularly telecommunications, information technology, and power generation. The Standards Association conducts over 200 standards ballots every year through which proposed standards are voted upon for technical accuracy, soundness, and acceptance. It thrives because of the technical diversity of its 20,000+ participants, consisting of technology experts and interested parties from around the globe, and includes individuals affiliated with corporations, universities, government agencies, and other organizations.

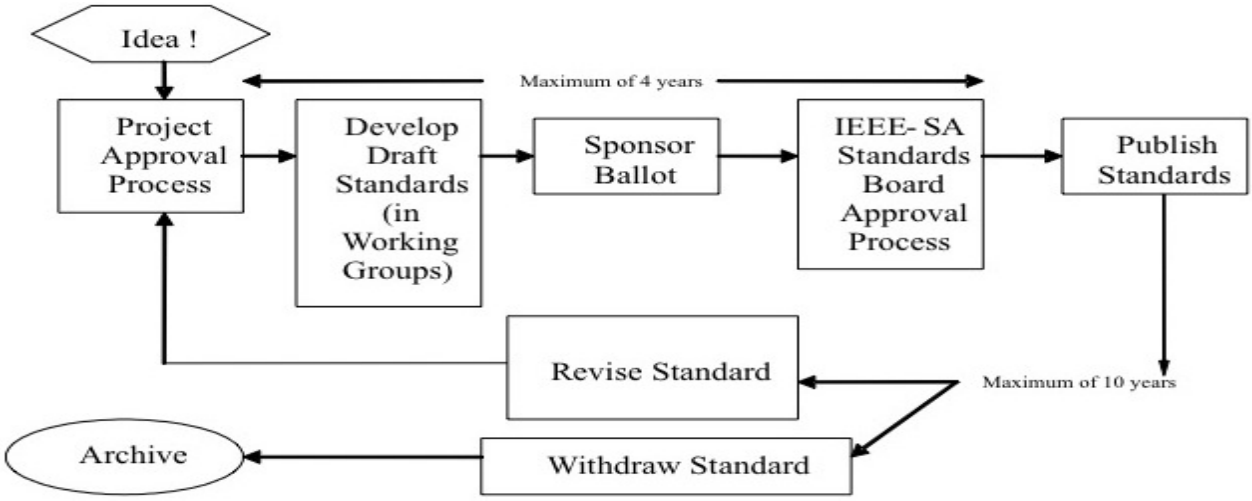
I. Standards Development in IEEE

There are two standards development processes within IEEE-SA, the individual process and the entity process.[1] Participants in the individual process act based on their qualifications and experience. Entity representative participants are appointed by an entity to represent it and act on its behalf. All participants, both individuals and entity representatives, are required to act in

[1] A given standard will be developed under only one of these two processes. For example, the 802.11 standard (indeed, the entire family of 802 standards) has been developed under the individual method. The 1901-2010 *Standard for Broadband over Power Line Networks: Medium Access Control and Physical Layer Specifications* has been developed under the entity method.

accordance with the IEEE Code of Ethics, which includes making decisions consistent with the safety, health and welfare of the public and disclosing real or perceived conflicts of interest. The standards development process is not to be dominated by any single interest category, individual, or organization. All meetings involving standards development are open to all interested parties. Any participant in a standards activity or meeting must disclose his or her affiliation. Given that IEEE is a neutral forum within which the standards development process is to take place, evidence of dominance is subject to corrective action on several levels. Individual participation in the standards development process operates on the principle of one person/one vote. Similarly, entity participation provides for one entity/one vote. IEEE owns the copyright in all compilations or collective work of its standards development process, such as any draft standard or final approved standard. Participants are responsible for determining whether disclosure of any of their contributions require prior consent of other parties and, if so, must obtain it.

IEEE standards follow a well-defined path from concept to completion, guided by a set of five basic principles: due process, openness, consensus, balance, and right of appeal.[2] The process is visually summarized in this chart:



[2] Material in this section is largely drawn from *Develop Standards*, available on the IEEE website at http://standards.ieee.org/develop/overview.html.

A. Authorization of a Standard Development Project

Standards projects are commenced when there is a need for an idea or concept to be standardized. The idea or concept can be broad or very specific. However, no standard is developed by one person alone; development of a standard requires group collaboration and consensus, which in turn require a process and neutral supervision.

Within the standards development work at IEEE, a sub-unit of IEEE (known as a "Sponsor") assumes responsibility for a particular standards idea. The Sponsor provides technical oversight for the standard and determines the scope and nature of the technical content. Sponsors for IEEE Standards are traditionally IEEE Societies and Committees, each of which specializes in a specific technology, industry sector, or other related interest. Projects can also be sponsored by Standards Coordinating Committees (SCCs, which are typically created when more than one Society is interested in the subject matter), or the IEEE-SA Corporate Advisory Group.

A standards project does not formally exist until the IEEE-SA Standards Board, known as the SASB, approves a Project Authorization Request (PAR). A PAR is a concise, structured, and highly detailed document that essentially states the reason why the project exists and what it intends to do. Often the members of a potential Working Group, that is, a standards developing group within a Sponsor, will have gathered to work on a PAR and to gain the support of their potential Sponsor. This type of gathering, known as a study group, can exist for up to six months before a PAR needs to be submitted. (New PARs can also be developed by existing Working Groups as additional projects.)

When presented with a PAR, the SASB determines whether the proposed standard development project falls within the technical scope of IEEE and the assigned Sponsor, whether the project

appears to fulfill a technical and/or market need, and whether the project is likely to attract enough volunteers to develop the standard.

B. Working Group

With PAR approval, the study group or other proposer that requested the project authorization forms a Working Group. Working Groups are open to participation by anyone.[3] Overall, Working Groups strive for broad representation of all interested parties and encourage global participation.

Working Groups must operate in compliance with the IEEE-SA requirements,[4] the Sponsor's Policy & Procedures (P&P), and the Working Group's own P&P. Some Sponsors allow each Working Group to develop its own P&P, which are subject to Sponsor review and approval and are subject to audit by the SASB. Other Sponsors develop a single Working Group P&P for each project type (individual or entity) that each Working Group of that type must adopt and follow. The IEEE-SA provides baseline P&Ps for Sponsors and Working Groups.[5]

A Working Group usually has a hierarchy of officers (typically a chair, a vice-chair, and a secretary) to ensure that the work proceeds smoothly. The chair's role is to provide leadership and guidance during the standards development process, helping move a draft standard towards completion. The chair will plan the meetings and organize the work. Agendas for Working Group meetings are distributed beforehand, and the results of the group's deliberations are publicly available, usually through meeting minutes.

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[3] In standards projects based on the individual method, participation does not require membership in IEEE or IEEE-SA. In entity-based projects, the entity participant must be a member of IEEE-SA.

[4] These are generally set forth in the IEEE-SA Standards Board Bylaws and the IEEE-SA Standards Board Operations Manual.

[5] Baseline procedures are available at **http://standards.ieee.org/about/sasb/audcom/bops.html**.

The Working Group does the detailed work of writing the draft standard. Typically, the group will identify the different sections that the draft standard will require. First, a scope and purpose statement is prepared based on the PAR information. Next, an outline is created. Often, this outline will serve as the structure for the standard as well, with the subjects in the outline becoming the clauses and subclauses in the document. Then the Working Group splits up the drafting work among the Working Group members. Draft sections are primarily written outside the formal Working Group meetings and are then brought back to the Working Group to resolve problematic areas. The Working Group will have a technical editor who compiles the group's work into a single document.

Not everyone in a Working Group will agree on the best method for accomplishing an objective within a standard. Sometimes Working Group members will disagree on technical issues or on phrasing, but sometimes they will disagree on fundamental technology approaches. At a minimum, consensus means that a majority must agree on an issue. The Working Group's and/or the Sponsor's P&P will define the levels of approval (e.g., simple majority or super-majority) that are required for approval of a draft standard within a Working Group.

A draft standard can go through multiple drafts within the Working Group before it is ready to proceed to the next stage. With each draft, the Working Group tries to narrow the differences among its members, through technical persuasion and compromise. Voting can be conducted at meetings or through "Working Group ballots" (not to be confused with the "Sponsor ballots" discussed in the next section). In a Working Group ballot, Working Group members can vote *Approve*, *Do Not Approve*, or *Abstain.* Members can also offer comments on the draft and

propose changes to address their comments, indicating whether resolution of the comment is necessary to change the member's vote.[6]

C. Sponsor Balloting

Formal consensus balloting begins when the Sponsor decides that the draft of the developing standard (written by the Working Group) is stable. The Sponsor forms a balloting group of persons interested in the standard. While anyone can contribute comments, the only votes that count towards approval are those of the eligible members of the balloting group. IEEE-SA's rules require that a balloting group be balanced among interest categories. Balloters usually fall into one of several classes (e.g., manufacturers, users, academic, government, or general interest). No interest category can comprise over one-third of the balloting group.

A standard will not pass unless at least 75 percent of all ballots from a balloting group are returned and at least 75 percent of the returned ballots (excluding Abstentions) bear an "Approve" vote. Reaching consensus also includes receiving and resolving comments. The ballot resolution group responds to all comments received within the balloting period, whether submitted from within or outside of the balloting group.[7]

D. SASB Review

The SASB approves or disapproves standards based on the recommendation of its Standards Review Committee (RevCom). This committee oversees Sponsors' compliance with all procedures and guiding principles in drafting and balloting a standard. As with PARs, completed draft standards come before the SASB seven times a year. After approval, the standard is edited

[6] Procedures can vary by Sponsor and by Working Group within a Sponsor.

[7] Once the ballot resolution group has examined and dealt with all comments, the Sponsor must recirculate the ballot if there is a need for that (for example, because new technical changes were introduced into the document).

by an IEEE-SA staff editor, given a final review by the members of the Working Group, and published.

II. Inclusion of Patented Technology

IEEE-SA seeks to produce standards that any willing implementer can use and that will become widely adopted. IEEE-SA's patent policy permits the inclusion of patented technology, because the best technological approach that the standards development participants select is or may be covered by a patent. Inclusion of patented technology without the patent holder's commitment that it will grant licenses to implementers on reasonable and non-discriminatory terms, however, could jeopardize the goal of widespread adoption. Consequently, IEEE-SA (like most SDOs) has adopted a patent policy intended to deal with this barrier.

IEEE standards may be drafted in terms that include the use of essential patent claims. Participants in IEEE-SA's standards development process are obligated to disclose the name of potential essential patent holders of which they have knowledge. A call for such information is made at every standards development meeting and the response to such request is recorded in the minutes. When a patent holder is identified, the working group chair (or a designee) then contacts the holder of such patent and asks for a Letter of Assurance.

The IEEE-SA Letter of Assurance is a specific form of agreement designed by IEEE on which the patent holder agrees to one of several options: 1) that a license will be granted without compensation to an unrestricted number of applicants on a worldwide basis with reasonable terms and conditions that are demonstrably free of unfair discrimination; 2) such license will be granted at reasonable rates and, at the patent holder's option, an indication of the ceiling for a reasonable royalty rate may be disclosed (in both cases a sample license agreement may be

attached); 3) no enforcement action will be taken by the essential patent holder; or 4) the patent holder discloses that it is unwilling or unable to grant licenses or agree not to enforce its essential patent claims. Finally, the patent holder, following a reasonable and good faith inquiry, may indicate that it is not aware of any essential or potentially essential patent claims to which the standard in question may give rise. The signatory to a Letter of Assurance agrees to bind its transferees and assigns to its terms or to provide notice of the Letter of Assurance through a Statement of Encumbrance. If the specific licensing terms (rather than a sample agreement) to which the patent holder would agree are submitted, such document will be appended to the Letter of Assurance. A copy of IEEE-SA's Letter of Assurance is attached as Appendix I.

Under its rules, IEEE-SA cannot require a patent holder to complete a Letter of Assurance. Moreover, if the patent holder is not in some sense a participant in IEEE-SA itself or in its standards development activity, the non-participating patent holder would claim that IEEE-SA's rules do not bind it. If a patent holder does not submit a Letter of Assurance or, alternatively, indicates that it will not grant a license, IEEE and its standards developers may consider the actions of such patent holder in determining whether to approve a standard as drafted.

A. Essential Patent Claims

The SASB Bylaws define "Essential Patent Claim" as "any Patent Claim the use of which was necessary to create a compliant implementation of either mandatory or optional portions of the normative clauses of the [Proposed] IEEE Standard when, at the time of the [Proposed] IEEE Standard's approval, there was no commercially and technically feasible non-infringing alternative." In other words, if it is not possible to implement the standard without infringing a patent, then the patent is essential.

B. Identification of Holders of Essential Patent Claims

The first step in IEEE-SA's policies relating to patents is to identify the potential assertion of "essential" patent claims. As noted above, IEEE-SA asks every participant in a standards development project, at every standards development meeting, to identify any holders of potential essential patent claims of which the participant is personally aware, and to do so as early as possible in the standards development process. IEEE-SA expects that Working Group participants will act in good faith and will identify any persons who might hold potentially essential patents (and disclose any known patents that might prove essential).[8] IEEE-SA goes to great lengths to ensure that standards development participants are aware of IEEE's patent policy. The SASB's Patent Committee (PatCom) has developed a set of instructional materials that are available to all participants and other stakeholders (and to the general public). These include a slide set that can be used to explain the policy at Working Group and other standards development meetings; a tutorial on the patent policy; and a set of FAQs, entitled "Understanding Patent Issues During IEEE Standards Development." These instructional materials are attached as Appendix II A - C.

C. Seeking Patent Commitments

Once the holders of potentially Essential Patents are identified, IEEE-SA (through the Working Group Chair or his designee) asks any person or entity so identified to state its licensing intentions through completion and submission of the IEEE Letter of Assurance form. As noted above, the Letter of Assurance form asks the patent holder to state its licensing intentions and

[8] An inherent limitation is that no set of written rules can hope to cover all conceivable circumstances. While the written rules provide participants with substantial guidance, the cooperative nature of standards development means that an SDO's written rules should not be interpreted with strict literalism. *See Understanding Patent Issues During IEEE Standards Development Patented Technology in IEEE Standards* at ¶ 17 ("the IEEE-SA does expect that participants will conduct themselves in good faith"), available at http://standards.ieee.org/faqs/patents.pdf.

provides a number of alternatives from which to choose. In one key option, for example, the holder can state that it is willing "to grant a license under reasonable rates to an unrestricted number of applicants on a worldwide basis with reasonable terms and conditions that are demonstrably free of unfair discrimination." While the IEEE-SA cannot compel a patent holder to mark the Letter of Assurance form to agree to such option (or even compel the patent holder to submit the Letter of Assurance form at all), as stated above, the absence of a Letter of Assurance (or the submission of a Letter of Assurance that indicates an unwillingness to provide any kind of assurance) is a factor that the IEEE-SA may consider when deciding whether to approve the draft standard.

D. Discussion of Costs

A standard often will take one technical course from among multiple possible approaches. Different technical approaches may have different benefits, and a sensible comparison may involve an understanding of whether or not the technical differences would justify the cost differential (if known). Nevertheless, as a matter of policy, IEEE-SA prefers that meetings of technical experts remain just that – technical meetings. While technical meetings should remain focused on the complexity, performance, and quality implications of proposals, they should also permit sufficient discussion to enable participants to understand the *relative* cost differentials (or to be able to take information back to their respective companies to have that kind of discussion and analysis internally). With regard to the costs of inputs used in implementing a standard, the only permitted discussion is the degree to which such costs may differ.[9]

[9] See IEEE-SA, *Promoting Competition and Innovation: What You Need to Know about the IEEE Standards Association's Antitrust and Competition Policy* (Approved 22 March 2007 (Updated 24 August 2010)), available at http://standards.ieee.org/develop/policies/antitrust.pdf.

IEEE-SA does not permit discussion at its standards development gatherings of: 1) the status or substance of ongoing or threatened litigation; 2) the essentiality, interpretation, or validity of patent claims; or 3) specific patent license terms or any other intellectual property right, other than what may have been disclosed on an Accepted Letter of Assurance.

III. Protecting the Value and Integrity of Patent Commitments

Patent commitments play a critical role in the standards development process. IEEE-SA has therefore taken steps to protect the value and integrity of the patent commitments made to IEEE-SA in Letters of Assurance.

A. Patent Commitments Protect Against Potential Hold-up

Patent commitments like the IEEE Letter of Assurance help protect implementers of a standard against patent hold-up. Hold-up can be defined as the ability of the owner of patented technology to extract higher royalties "after its technology has been chosen by the SDO as a standard and others have incurred sunk costs which effectively increase the relative cost of switching to an alternative standard."[10] Consequently, IEEE uses the Letter of Assurance process to ask patent holders if they are willing to grant licenses on Reasonable and Non-Discriminatory ("RAND") terms. IEEE asks that the identity of potential essential patent holders be disclosed, and Letters of Assurance submitted, as soon as reasonably feasible in the standards

[10] U.S. DEPARTMENT OF JUSTICE AND FEDERAL TRADE COMMISSION, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION at 35 (2007), available at http://www.justice.gov/atr/public/hearings/ip/222655.pdf. *See also* Gerald F. Masoudi, Deputy Assistant Attorney General, Antitrust Division, U.S. Department of Justice, *Antitrust Enforcement and Standard Setting: The Vita And IEEE Letters And The "Ip2" Report* (May 10, 2007), available at http://www.justice.gov/atr/public/speeches/223363.htm ("Patent hold up can be defined to involve a situation where all the following conditions exist: [1] after the standard is set, the holder of a patent essential to that standard identifies a patent, or attempts to impose licensing terms, that SDO members could not reasonably have anticipated; [2] it is not a commercially reasonable option to abandon the standard and attempt to create an alternative, due to the cost of the standard setting process itself or the cost of developing products incorporating the alternative standard; and - most importantly - [3] if the other SDO members had anticipated the patent holder's demands, those SDO members could have chosen a different technology that avoided this patent.").

development process once the standards development project has been approved (and certainly before the IEEE-SA Standards Board determines whether to approve the proposed standard for publication).

The term "reasonable," however, is inherently vague, and the ability of patent commitments to protect against hold-up is thus imperfect. Sometimes this vagueness (and the consequent inability of parties to agree on a negotiated, "reasonable" license) will lead to expensive litigation whose cost and risk can impede the adoption of a socially valuable standard. Even without litigation, the ex post negotiation of license terms (that is, negotiations occurring after a technology's inclusion in a standard has increased the patent holder's market power, potentially to the point of monopoly) can lead to higher royalty payments and ultimately higher prices to consumers.

In 2007, IEEE-SA adopted a provision to facilitate understanding of a patent holder's licensing position. IEEE-SA's current patent policy expressly permits (but does not require) the submitter of a patent commitment to provide with its commitment (i) a not-to-exceed license fee or rate commitment, (ii) a sample license agreement, or (iii) one or more material licensing terms. Other approaches (such as VITA Standards Organization's policy for mandatory disclosure of maximum rates) are also possible.

B. Patent Commitments Are Irrevocable

A patent commitment must be durable for the standards development process to function. If a patent holder could withdraw a commitment, then a standards development group could not rely on it. Years of joint effort would be wasted if the standards development effort had to be reversed. Alternatively, if the standard had already been adopted, the reneging patent holder would be able to extract monopoly profits from all implementers because there would be no

competing and non-infringing alternative for compliance with the standard: by definition the committed patent is "essential" for a compliant implementation of the standard. Thus, under the IEEE-SA rules, a patent commitment "is irrevocable once submitted and accepted."

C. Patent Commitments Are Binding on Successors and Assignees

The patent commitment needs to be durable even if the underlying patent is transferred. From the perspective of IEEE-SA (and other SDOs) and would-be implementers of the standard, what matters is not the identity of the patent holder, but the continuing validity of the commitment after transfer. Permitting a commitment to evaporate upon transfer would mean that the commitment is not worth much. "Patent laundering" would confer on the successor the ability to extract supra-competitive royalties. The original holder would have an incentive to create that ability and to split the value with a successor. Consequently, the appropriate rule is simple and clear: a successor to a Letter of Assurance should be bound by the same commitments as its transferor. Thus, IEEE-SA policy requires that the original provider of the commitment bind its successor to honor the commitment (who then needs to bind its successor to honor the commitment, and so on).

Conclusion

IEEE fully appreciates the importance of a comprehensive patent policy and, as explained above, has realized on such understanding through a balanced framework with detailed rules and procedures that define how patented technologies should be taken into account within IEEE standards. However, the current issues cannot be addressed by applying "downstream" measures, (that is, essentially in the form of an SDO's patent-related rules and procedures, no matter how good they may be) or, as some have suggested, the imposition of governmental

regulations on SDOs. Due to the global nature of many ICT standards, cooperation between USPTO and IEEE, as well as among other leading SDOs, major patent offices, and other regulators, is necessary. The governance of the process must start with improved self-regulation of patenting behavior during the early phases of the standardization process, rather than focusing exclusively on how patented technologies should be included into standards that are nearing the completion of their development. As we have indicated above, and in the IEEE-SA testimony before the Subcommittee, IEEE-SA's patent policies are well established and IEEE-SA is responding to these ongoing developments.

IEEE would like to thank the Subcommittee for the opportunity to offer this written submission and hopes that it has provided an explanation of the standards development process and, in particular, insight into the workings of IEEE-SA. We would look forward to further cooperation and collaboration on this important set of issues and would welcome the occasion to provide further consultation as we, in keeping with the IEEE mission, continue to examine effective means of supporting innovation in the advancement of technology for humanity.

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