



Standards in Automotive Sector: Impact of Patents on its Development

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Received: 1st December 2019; accepted: 9th September 2020

With the increased awareness and focus on safety systems in the automotive domain, it is imperative for regulatory authorities to not only bring in the latest technologies but also ensure reachability and affordability for all. However, the patents related to the latest safety features concentrate in the hands of a few technology leaders, thus rendering the technology access costly and scarce. In such a scenario, adapting principles of SEPs and their permit of use in FRAND conditions as in the telecom domain would create a symbiotic relationship between the technology producers and end-users. The first part of this paper deals with studying the relevant patent filing activities to sensitize the innovation happening in the field of automotive engineering in general and automotive safety in particular. The second part focuses on standards and its establishment process in India and its global context in terms of harmonization. The third part deals with the gap in the operation of Indian Standard establishing authorities and the Indian Patent system. This paper concludes by arguing that it is essential to adopt a cross-functional team to horizontally utilize the best of learnings of the telecom domain in terms of licensing SEPs under FRAND terms.

Keywords: Standards, Standard Essential Patent, Automotive Standards, Automotive Patents, FRAND, Licensing, SEP, Agreement on Technical Barriers of Trade, Standard Setting Organisations

Standardization may be defined as the process of establishing standards through consensual means. In other words, it is institutionalization of specifications and practices for their gradual and dynamic perspective validation.¹ Standards are public documents that are outcomes of the process of standardization that has specifications and procedures to ensure that a defined product or process fulfils the purpose it was designed for and performs the way it is supposed to.² Standardization provides the groundwork for all the technical agreements and, most important regulations.³ Therefore, it could be argued that standards guide the users to make an informed decision on a product's quality, safety, performance, and environmental perspective. They play a vital role in shaping various product parts compatible with each other, thus facilitating international commerce. As a result, multiple stakeholders, including organizations engaged in multiple businesses, take part in standard development proactively. Also, it could be observed that compliance with standards is voluntary, but in multiple instances, governments make it compulsory on public interest. Once the standard becomes mandatory, it could be said that the standard has

become technical regulation. However, it is even more important to understand the linkage between the standards and the underlying patents to establish the standards. While there are established processes and models on licensing the Standard Essential Patents (SEPs) in telecom domain, their application in other areas such as automotive sector in general and vehicular safety systems in particular has been unheard of.

Patents and Standards in the Automotive Sector

There has been a remarkable shift in the vehicle safety systems over the last 40 years, thanks to the increasing investigation of the injury criteria tolerance withstood by riders and pedestrians.⁴ One of the most critical concerns is providing vehicle safety at an affordable cost to the users in the ever-growing competitive automotive market. The significant driving factor for increasing focus on automotive safety systems in India, is its increasing population, rising middle class and increase in vehicle population and access to better roads.⁵ India's rapid annual growth with a Compounded Annual Growth Rate (CAGR) of 3.1%, 5.4%, 5.6% and 10.2% for the years 1970-80, 1980-90, 1990-2000 and 2000-10, respectively has pushed India to urbanize and modernize its roads and allied infrastructure rapidly.⁶

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As a result, there is a live ecosystem on the development of the science behind all the facets related to the automotive sector, including safety, emissions, etc., the user base and its variance, the regulatory agencies involved. For instance, the number of patents filed across various individual areas in the automotive sector has seen significant uptrend (Fig. 1).

Figure 1 illustrates the patent filing trends in the auto sector in the last 12 years in the US. Apart from 2009, which coincided with the economic recession, all the other years have seen an uptrend in patent filing activity in the auto sector.⁷ Other factors that impacted the increase in patent filing activity were the involvement of new entrants in various fields of the automotive sector and increasing variation of consumer tastes by prioritizing technological innovations over brand loyalty. Fig. 2 illustrates patent filing activities in individual technical areas.

Vehicle safety systems are subject to significant research and development efforts that reflect in the number of patent filings. All the above-illustrated areas would be a hotbed of innovation in years to come in the future. From the trends pictured above, it could be observed that there is significant growth of patent filed in the field of vehicle safety system from 2010 to 2014, after which there is uniformity in the number of filings. This gives two inferences: (i) A lot of research and innovation is happening in the field (ii) There is no spontaneous demand and ecstatic research output over safety systems when viewed in terms of patent filing activity.

With the increasing levels of innovation and patent filing activity happening across the domain of automotive safety standards, it is also important to have a detailed discussion on the development of corresponding standards not only in developed

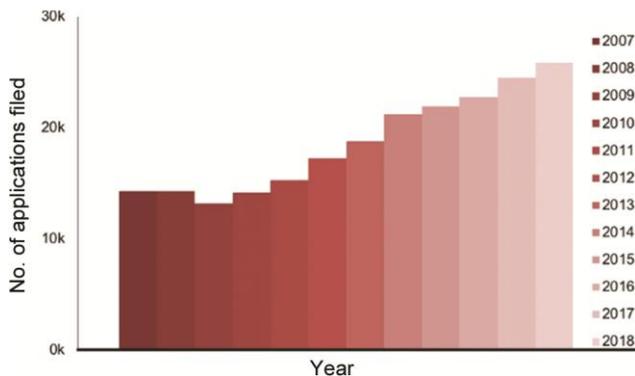


Fig. 1 — Automotive patent filing trend in the US from 2007 to 2018
Source: Franklin and Gaudry, Patent Trend Study, 2019

markets but also in India too. This is evident from the argument that innovation, which is mostly secured by patents, turn to standards over standard making deliberations in India and elsewhere.

Standard Making Bodies and Bureau of Indian Standards

The BIS is the national standard body in India. It is the primary agency responsible for the overall development of all the activities associated with the process of standardization, marking, and certification of goods and services. The standards and certifications developed by the BIS, apart from benefitting the consumers and the industry, also support various public policies in areas such as safety, consumer protection, etc. Of all the 24 Standard-setting bodies in India,⁸ the BIS is the most prominent agency that addresses the majority of industrial sectors in India. The BIS sets voluntary standards that are made compulsory by the Government of India in multiple instances. The functioning of BIS could be summed under⁹ various internal and external areas, including providing laboratory services, training, and publicity, among other activities, including the formulation of standards.

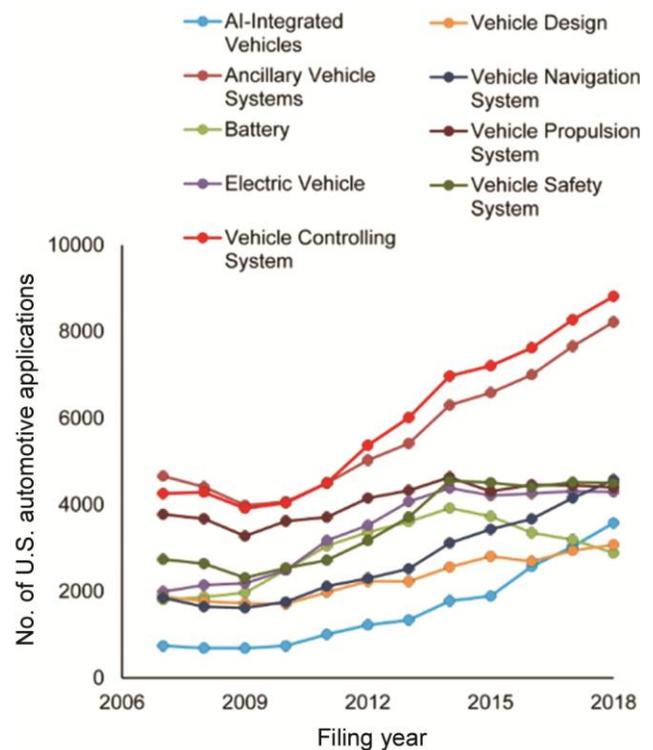


Fig. 2 — Patent filing trend in individual technical areas of the auto sector in the US
Source: Franklin and Gaudry, Patent Trend Study, 2019

Formulation of Standards

The Standard Advisory Committee undertakes all the steps required for the formulation of a standard. Fig. 3 illustrates the standard formulation process of

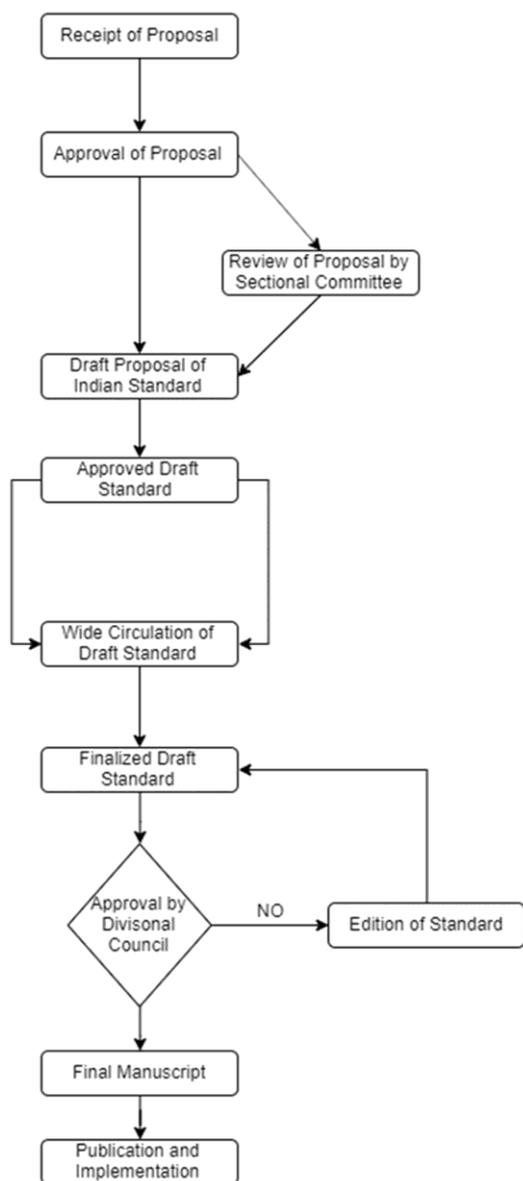


Fig. 3 — Standard formulation process of BIS

Source: Bureau of Indian Standards: An Overview, New Delhi, BIS, May 1989

BIS.¹⁰ A proposal for the formulation of a standard is approved by the respective divisional council and sent to the appropriate technical committee for making the standard. Any recognized member or any ministry or able government body may submit a proposal to the BIS for establishing a standard in writing. The formulation of the standard proceeds when the Divisional Council assigns the formulation of the standard to an appropriate sectional/technical committee for the purpose. Sometimes, new technical committees are appointed for the purpose. After that, a draft standard is proposed and circulated for review and suggestion. The circulation is waived off if the subject matter is non-urgent or non-controversial. Particular emphasis is provided for areas that are multidisciplinary and involve essential areas such as energy conservation, environment, safety, etc. The suitable technical committee finalizes the draft after giving due deliberation to all the comments received. The draft is then sent to the Sectional Committee for approval and submitted to Chairman of the Divisional Council for adoption. All the adopted standards are reviewed periodically.

There are fourteen areas of operation of BIS for developing standards in various subsystems. Each of these sectors is represented by fourteen Division Councils, which updates the detailed work programme regularly. The work program is a periodic publication that indicates the latest position of published Indian Standards and its amendments, including revisions and other information. In 2017-2018 (published in 2019), a total of 800 technical committees worked in the above mentioned 14 technological areas. A total of 450 new standards were produced during the above period. Table 1 illustrates the formulation of standards in India in the last five years. Additionally, the chart shows the harmonization of BIS standards with international standards. By the end of FY 2017 (31 March 2018), the number of Indian Standards was marked 19,294 standards and the number of harmonized standards stood at 5263.¹¹

Table 1 — Year-wise standard formulation by BIS

Year	No. of Technical Committees	New Standards	Revisions	Harmonization with International Standards
2017-2018	800	450	292	112
2016-2017	286	371	351	109
2015-2016	264	336	273	129
2014-2015	615	409	339	152
2013-2014	232	309	238	165

Source: Author's compilation from BIS annual reports of the last five years (FY 2013- FY 2018)

Fig. 4 illustrates the working of BIS across different years from 2017-18 to 2013-2014. The year 2017-18 had about 800 technical committees working in all 14 functional areas (Fig. 3). It leads to a total of 742 standards (450 new and 292 revisions) that were issued in the same FY. Additionally, to stay in resonance with the global agencies of standardization, such as, ISO, IEC, etc. following the Agreement on Technical Barriers of Trade, there were about 112 Indian standards that were harmonized with international standards. It could be observed from the last five years of the published information in the annual reports, and there is no observational trend in the numbers of standards issued or the number of technical committees or numbers on harmonization with international standards. It could be established that the trend is more of a need-based instead than following a set pattern.

Automotive Standards in India

The automotive sector has a huge contribution to the overall economy of India where it contributes about 7.1% of its total GDP.¹² The regulations in the automotive sector are controlled by the Ministry of Road Transport, Highways, and Shipping (MoRTH&S). The principal legislation for regulation is the Motor Vehicles Act (MVA), 1988, and the Central Motor Vehicles Rules (CMVR), 1989. The regulations on safety and emissions are performed *via* the consultation and advice of three committees:¹³

- (i) CMVR- Technical Standing Committee (CMVR-TSC)

- (ii) Standing Committee on Implementation of Emission Legislation (SCOE)
- (iii) Automotive Industry Standards Committee (AISC)

The main stakeholders for various facets of automotive safety standards involved are AISC, CMVR-TSC, and BIS (Fig. 5) for the formation of standards in fields such as safety, emissions, noise, fuels, energy consumption, and alternative fuels vehicles. Based on the endorsements on the stakeholders involved, the MoRT&H makes notifications for needed amendments in the CMVR Rules. Additionally, Ministry Of Environment And Forest, Ministry of Petroleum And Natural Gas, and Ministry Of Non-Conventional Energy Resources are the required agencies for making regulations related to standards on emissions, noise, fuels, and alternative fuel vehicles, respectively.¹⁴

Global Standard Harmonisation in for Automotive Sector

While developing standards at the national level are important, considering the local requirements and needs, it is also important that the locally developed standards be in coherence with international norms and precedence. The chief agency that looks after is the World Forum for Harmonisation of Vehicle Regulations (WP.29), which comes under the institutional framework of the United Nations Economic Commission for Europe (UNECE).¹⁵ It comprises globally harmonized performance-related requirements and procedures for tests. They strive to

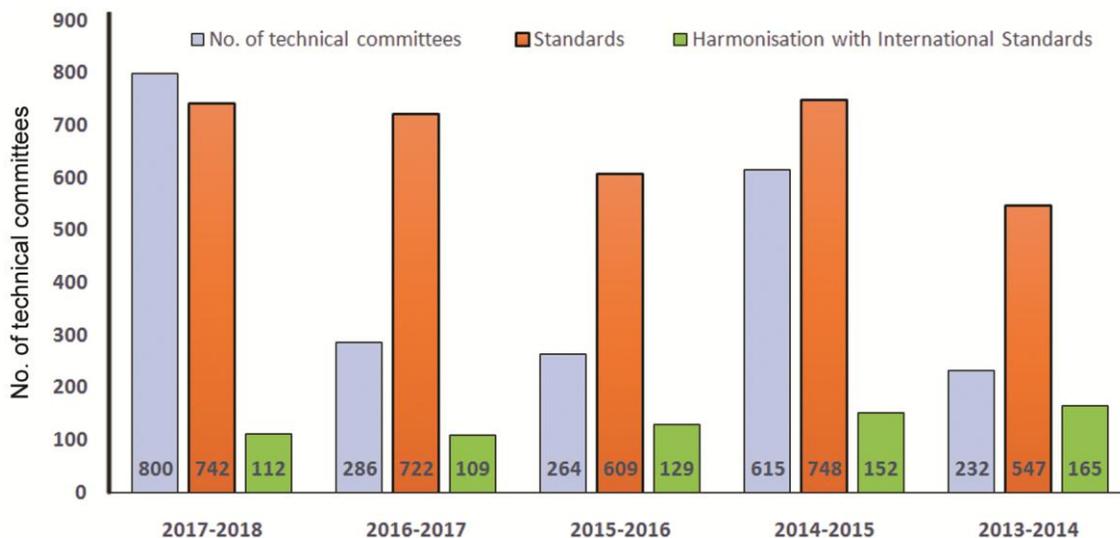


Fig. 4 — Performance of the formulation of BIS in the last 5 financial years
 Source: Author's compilation from BIS annual reports of the last five years (FY 2013- FY 2018)

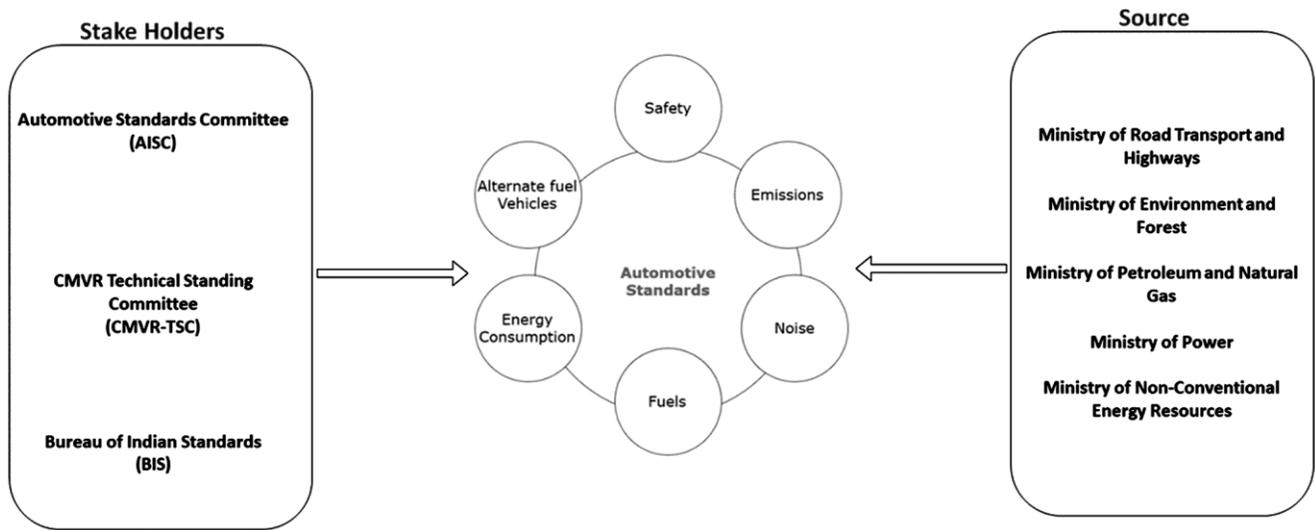


Fig. 5 — Standards and stakeholders for automotive safety.

Source: Author's compilation

achieve a predictable regulatory framework for the worldwide automotive industry. India is a signatory for this agreement since 2006 and is actively involved in the development of Global Technical Regulations (GTRs). Currently, more than 70% of India's safety regulations are either partially or fully aligned with the GTRs keeping in balance both the UN regulations and the local driving and environmental conditions of India.¹⁶ The regulatory framework (WP.29) promotes innovation in-vehicle technologies in addition to improving safety across the entire vehicle spectrum globally.

Standards, Automotive Safety, and Indian Patent System

While patents help in securing and bringing in new technologies to the market for the public at large, standards help in wide adoption of the technologies permitting structured development and interoperability of various components in the technology. It is essential to understand that for operating a given standard, a company may have to choose a particular technology that might be protected. The conflict arises when the use of such standards leads to the use of protected technology, causing violation of patent rights. For avoiding such patent violation, various Standard Setting Organisations (SSOs) are established which license out the patents that are essential for such standards, also called SEPs under conditions of Fair, Reasonable, and Non-Discriminatory (FRAND) principles. The use of SEPs under FRAND has given a win-win situation for both, the end-user who gets

the latest technology at a fraction of cost, and for the technology producers who license the patents at nominal fees and reaping benefits in volumes. However, the usage of licensing SEPs under FRAND has not been critically looked into domains beyond telecommunications and associated areas. For example, making standards-based on critical technologies in the automotive industry, particularly for safety systems, could have a significant positive impact on a large user base as well as may reap benefits for technology producers. However, there exists a gap owing to the following conditions:

- (i) Both the verticals, i.e., IPO and AISC, work under different ministries of the Government of India.
- (ii) The motives and goals of both organizations are different in terms of their objective and working nature. For instance, IPO works on the promotion of innovation culture and the consequent protection of intellectual property in the country. The IPO acts as the nodal agency for patent-related laws and regulations, while the AISC assists CMVR-TSC for framing of automotive standards.
- (iii) There is no-correlation on the framing of standards by taking into consideration the associated IPR assets of participating organizations and their dominant positions in terms of patent holdings by various automotive companies. For example, on one side, automotive safety standards such as Antilock Brake Systems (ABS) and Combined Brake

System (CBS), such as IS 14664 (2010), are done in consultation with various two-wheeler manufacturers; the technical parameters and capability of the organizations are seldom studied to avert any misuse of any dominant position by such organizations.

Conclusion

Lack of coherent systems wherein both the domains of IP as well as automotive safety systems as in the automotive industry are detrimental in providing a cost-effective solution to existing safety issues. This needs of imminent addresses of overhauling the regulatory framework of establishing standards in India that would have a cross-functional action to fulfil today's demands of going in tandem with cross-functional inventions and consequent regulatory changes especially for automotive safety systems. This would demand of establishing systems and processes that would create a cross functional team utilising the principles of patent law and safety standard establishment system to come out with a solution wherein the best learning of licensing essential safety related patents under FRAND terms could be utilised. In other words, there needs to be a system wherein the learning of SEP licensing under FRAND terms could be horizontally deployed to other areas such as automotive safety systems.

As India moves ahead in adopting better technologies and systems with the implementation of new automotive safety norms, it is imperative that the technologies associated with such solutions/proposals need to be available in a more comprehensive, more accessible, and cost-effective manner. Further, it is also essential to maintain a balance and motivation in terms of commercial profit for innovators to provide such solutions. Hence, there is an urgent need for formulating a cross functional arrangement in India, which would further engage technology providers, suppliers, and end-users to effectively utilize each

other leading to adaptation of such safety norms in a more comprehensive and much cost-effective manner.

References

- 1 Blind K, *The Economics of Standards: Theory, Evidence, Policy* (Edward Elgar), 2004.
- 2 Members ISO, <http://www.iso.org/cms/render/live/en/sites/isoorg/home/about-us/members.html> (accessed on 23 November 2019).
- 3 WTO: Non-Tariff Measures, <http://www.intracen.org/Part-3-Difference-between-standards-and-technical-regulations/> (accessed on 23 November 2019).
- 4 Christensen J & Bastien C, *Nonlinear Optimization of Vehicle Safety Structures: Modelling of Structures Subjected to Large Deformations* (2016), <http://www.myilibrary.com?id=878821> (accessed on 23 November 2019).
- 5 Ponnaluri R V, Road traffic crashes and risk groups in India: Analysis, interpretations, and prevention strategies, *IATSS Research*, 35 (2012) 104–110.
- 6 Reserve Bank of India, Government of India, Macro-economic aggregates (at constant prices) in India, <http://www.indiastat.com> (accessed on 23 November 2019).
- 7 Franklin T and Gaudry K, *Patenting Trends Study*, <https://www.kilpatricktownsend.com/Insights/Publications/2019/4/PatentingTrendsStudy>, (accessed on 23 November 2019).
- 8 Development, Trade, And The WTO: A Handbook, (B. M. Hoekman *et al.* ed., World Bank), 2002.
- 9 About BIS, https://bis.gov.in/?page_id=2348(accessed on 23 November 2019).
- 10 Prasad P M, *Business, Consumer and The Government: An Economic and Legal Perspectives* (India and Germany), (Mittal), 2001.
- 11 BIS Annual Report 2017-2018.
- 12 National Auto Policy Draft 2018.
- 13 Siamindia.com, Society of Indian Automobile Manufacturers, <http://www.siamindia.com/technical-regulation.aspx?mpgid=31&pgidtrail=32> (accessed on 23 November 2019).
- 14 Society of Indian Automobile Manufacturers, <http://www.siamindia.com/technical-regulation.aspx?mpgid=31&pgidtrail=32> (accessed on 23 November 2019).
- 15 WP. 29 - Introduction - Transport - UNECE, <https://www.unece.org/trans/main/wp29/introduction.html> (accessed on 23 November 2019).
- 16 National Auto Policy Draft 2018, https://dhi.nic.in/writereaddata/UploadFile/DHI-NAB-Auto%20Policy%20Draft%20Document_vDRAFT.pdf (accessed on 9 September 2020).