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Comments on the TRAI"s Consultation Paper dated 10th July 2017 on "Issues related to Digital Radio Broadcasting in India" Submitted by Xperi Corporation HD Radio™ Technology Group

On 10th July, 2017 TRAI published a consultation paper on digital radio for India. In this paper, the following questions were presented for consideration of the future plan.
The answers below are provided to offer guidance on digital radio transition based on experience from HD Radio implementations across North America.

General Statement about Digitization of FM

India must adopt a digital radio solution which has demonstrated maturity in broadcast solutions and consumer products. The Indian market must not experiment with this important decision.

A broadcast solution must be available from multiple manufacturers and must demonstrate support across the entire radio station eco-system. That eco-system includes transmission equipment, antenna systems, studio automation solutions, audio processing solutions, status & health monitoring solutions, and depth of technical support. The broadcast technology must be 3rd generation equipment which has stabilized the operational interfaces, established high level of performance and quality, and demonstrated years of reliability in field applications.

The solution for India needs to have a realistic roadmap for services and products which benefit the Indian broadcaster and consumer. The vision of Digital India can grow with a digital FM system providing back-bone infrastructure for cost-effective delivery of audio content to radios and data services content to IoT devices. Radio broadcast is the most cost effective medium for sending broad-use data to thousands or millions of devices in a local market.

Consumer acceptance and adoption is critical for the success of any digital radio solution. The market must have access to affordable, attractive, and reliable receiver products. The technology solution must be available to many companies to allow customization of products and innovation in designs. The radio eco-system needs to include products across the consumer spectrum including car, home, and mobile devices. A mature product ecosystem includes multiple companies who can provide low-cost IC solutions and companies experienced in the development and manufacturing of hardware and software for digital radio receivers. Factories will also require test standards and test equipment to support mass production. Without broad partnerships across the semiconductor, design ODMs, and factories the variety of products will remain limited and the costs will remain unaffordable during the critical stage of early consumer adoption.

Quality standards are critical to the successful operation of any digital solution. Transmission systems and radio devices must comply with standards and performance metrics to ensure long term operations. The technology solution must have a demonstrated, successful certification program to ensure transmission equipment and radio receivers meet minimum acceptance standards. The digital radio system must also demonstrate the ability to monitor operations of radio transmissions to ensure quality of the services and reliable operations. These quality standards for transmission and receivers can be established within the regulatory requirements for technology adoption and product sales. Without quality standards and quality monitoring, the digital radio solution will be at risk from non-compliant products developed through an open standard.

5.1   Is there a need to encourage or facilitate introduction of digital radio transmission at present. If so, what measures do you suggest and in which market?

Digital radio transmission can provide many different services and solutions to the public. Selecting a digital radio standard had tremendous repercussions on the broadcast infrastructure for decades and it is important to make informed decisions which align with policy and the needs of Digital India. Selecting the wrong system or technology will delay consumer adoption while selecting the right system will accelerate the transition. It is necessary to demonstrate and test digital radio solutions to ensure that the new standard meets the needs of India's broadcasters and consumers.
Digital services should be evaluated in key markets such as Delhi, Mumbai, and Chennai as well as in rural areas. Evaluation should include reception performance and coverage, potential interference, and ability to deliver different types of services (audio, text, emergency notifications, other data). All of these data will support policy planners and spectrum management teams as they develop the digital radio regulations.

5.2   Is there a need to frame a roadmap for migration to digital radio broadcasting for private FM broadcasters? If yes, which approach, mentioned in para 4.7, should be adopted? Please give your suggestions with justification.

Digital radio should follow a managed introduction. A full broadcast deployment will take several years and consumers will need to have cost-affordable radio products.
The roadmap for migration must align with the vision of Digital India with respect to timing and capabilities. By setting the vision for use of a digital radio system, TRAI will establish key requirements and evaluation criteria to define the decision process.
Starting the transition to digital radio requires leadership from key broadcasters. Several digital radio systems have benefited from financial or regulatory incentives for innovative and leading broadcasters or groups who are willing to make initial investments in technology.

5.3   Should the date for a digital switch over for radio broadcasting in India need to be declared? If yes, please suggest the date with suitable justification. If no, please give reason to support your view.

A mandate for full digital switch over will be successful only if there are nation-wide services and sufficient consumer products. The government must consider a roadmap for digital broadcast which accounts for the timeframe to establish nation-wide digital transmission along with the timeframe for all consumers to have access to digital receivers.

A date for digital switch over should not be decided at this time. The consideration for date for digital switch over should be reviewed 5 years after the commercial launch of the digital radio system.

5.5   Should single digital radio technology be adopted for entire country or choice of technology should be left to radio broadcasters? Support your reply with justification

The decision for digital radio technology should be adopted for the entire country. A nation-wide solution will minimize the consumer costs.

Multiple digital radio technologies will either increase the cost of radio products to support multiple technologies. Or consumers will need to purchase multiple receivers to enjoy the benefits of different technologies from different broadcasters.

5.6   In case a single digital radio broadcast technology is to be adopted for the entire country, which technology should be adopted for private FM radio broadcasting? Please give your suggestions with detailed justification.

HD Radio technology is the most mature digital radio solution for the FM band. This technology has been established across North America and other countries with over 4000 digital radio programs and other services transmitting daily. India will benefit from the availability of affordable receivers and mature services.

5.7   How issues of interference and allocation of appropriate spectrum allocation can be settled in case the option to choose technology is left to radio broadcasters?

India should follow the models and experience used by other countries which have launched digital FM broadcasts. The FCC in U.S. and IFT in Mexico have established digital radio spectrum policies based on analog radio spectrum use. These policies did not require any new regulations for digital broadcasting.

5.9   Should the existing operational FM radio channels be permitted to migrate to digital broadcasting within assigned radio frequency? If yes, should there be any additional charges

as number of available channels in digital broadcasting will increase? Please provide a detailed framework for migration with justification.

There are several benefit for digital broadcasting to remain within assigned radio frequencies. First, this is the most cost-effective way to implement digital broadcasts. Radio broadcasters do not need to invest in additional transmitters or infrastructure. The digital transmission can remain within ITU mask levels utilizing a single transmitter for analog and digital transmission. Second, there is benefit for broadcaster band recognition. Maintaining the digital broadcast in-band and on-channel allows the consumer to tune to the same frequency for analog or digital services. A radio station can continue to identify with a singular transmission assignment.

5.13 What measures should be taken to reduce the prices of digital radio receivers and develop ecosystem for migration to digital radio broadcasting?

Affordable consumer receivers are dependent on production volumes. Based on HD Radio development over 15 years, the product cost starts initially very high and ultimately achieves mass consumer price points.

Initial production runs are generally targeted toward early adopters, technology enthusiasts, and experimental groups. Initial HD Radio receiver price points were above $200US (Rp 13000) in low production volumes of 1000 pieces.

As adoption increases, manufacturers are able to amortize non-recurring engineering costs and achieve better pricing on components. For the HD Radio system, this consumer pricing was achieved after 8 years of production. Manufacturers are now able to achieve radio retail costs of under $40US (Rp 2500) with much higher production volumes over 10,000 pieces per month.

Low cost manufacturing for digital radio can be achieved slowly by allowing the market to grow at a natural pace.

Alternatively, India can benefit from the existing production infrastructure of established digital radio solutions and the HD Radio product design teams.

5.14 Stakeholders may also provide their comments on any other issue relevant to the present consultation.

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