

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?

Answer: Yes, this is a right time for digital radio transmission. Nowadays people are well known to the word “Digital” and many things today are advertised as digital to provide a sense of advanced or more efficient, moreover DRM along with many digital radio transmission technologies have been in the development and execution phase for quite some time to know that it is ready to fly without any obstacle to reach a global mile stone.

With more & more urbanization and increase of FM radio operators in Tier I / Tier II cities, the bandwidth availability to create a more robust transmission channel is greatly reducing and there is a need to advance the implementation of digital transmission before FM phase III to ensure better usability and efficiency for broadcasters.

Since there is a chicken & egg problem when it comes to adoption of new technology such as digital radio, there needs to be a detailed roadmap to bring synergies in the process and ensure that goals are achieved across board from time to time., Considering that smartphone has become a major source of technology consumption in the day to day aspect of humans it would be a very critical and essential step to loop in these phone manufacturers to introduce the digital radio receivers in the next generation of smart phones., along the same timeline it is paramount to bring in content creators alongside broadcasting station to build interactive and informative content that can truly utilize the full suite of technology being provided by adaptation of these new technologies in the broadcasting stations. And it goes without saying that the radio broadcast stations themselves play a vital role in the converting their and their listeners to the newest medium.

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.

Answer:

(iii)Managed introduction approach would be most suitable to digitize radio in upcoming years. Ideally this might be carried out by introducing digital transmissions in simulcast mode alongside current analog transmission frequency spectrum (this method has been recently tried and tested in Indonesia & South Africa successfully) and gradually reducing the analog transmissions over a period of 3 - 5 years to allow smooth transitions on both broadcasters and receivers end.

(i)Full conversion is not an advisable option at this time, since there is a huge vacuum in the market for affordable/budget friendly digital radio receivers, also the existing listener base which primarily depend on analog broadcast will

be severely impacted, which would cause a huge public backlash alongside broadcasters.

(ii) Market Based approach is a honey pot to attract more broadcaster to ensure faster conversion, however such an approach might backfire since the regulatory authority doesn't impose strict guidelines for conversion resulting in broadcasters using the legacy technologies to make better profits on a short term basis. This would later result in noncooperation from broadcasters to ever shift towards a digital only transmission.

3) Should the date for 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.

Answer: Yes, there is a need to declare digital switch over date in India similar to Norway this instills a sense of urgency and necessity among listeners and broadcasters alike to look for a more extendable and futuristic device on purchase and new installation, resulting in a swift conversion.

However digital switch over date might not necessarily be a single date for entire country but rather a carefully crafted switchover period ranging from several weeks to months targeting specific cities across multiple tiers.

This can be done in a much effective way if broadcasters are allowed to carry out simulcast transmissions on analog transmission for a predetermined period of 3 months., to encourage listeners and late adopters to make the switch while still able to listen to their favorite programs.

4) Is present licensing framework or regulatory framework is restrictive for migration to digital radio broadcasting? Please explain with justification.

Answer: Yes., but only partly ..., the current regulatory framework needs some more pronounced guidelines for migration which might help radio broadcasters to test and evaluate latest and greatest technologies and codecs out there to get a better assessment for such a conversion and also to create synergies across industries who might be looking for Muzak like services.

For example, if an existing digital radio broadcasting technology (IBOC) is extended in future to allow transmission to a selective listener (currently available in FMeXtra) using conditional access and encryption on one of the audio channel, it might greatly impact the bottom line of the broadcasters in

both public and private sectors by providing Muzak like services to cab aggregators and franchise outlets.

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.

Answer: Although providing a choice of technology to switchover is a better option and should be decided on case to case basis., there needs to be a unifying base transmission technology to ensure that all listeners irrespective of whether the radios are equipped for the latest audio codecs (HVEC+, DAB+) or not, are still able to listen to the transmission across the nation.

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.

Answer: DRM+ (DRM broadcasting in FM band) is the best choice for FM radio broadcasting.

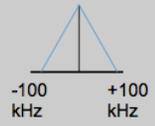
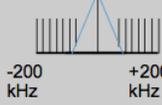
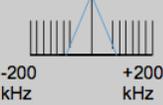
In all our research to answer this very question we have found that DRM / DRM+ being the latest in the suite of IBOC has the most balanced benefits to cost ratio and is being widely developed and adopted to make it compatible to any other technology out there.

Furthermore, DRM+ will work in FM band range from 88-108 MHz and it's been successfully tested in many countries.

In the existing bandwidth of 200Khz it can carry 4 channels which could be any mix of audio and data services, this will lead to effective utilization of frequency spectrum and reduce the dependencies between players which is most vital for introduction of bandwidth and power hungry technologies like DAB and DAB+.,

The below images makes the case in point.,

Comparison FM, HD Radio™, China Digital, DRM+ and DAB+

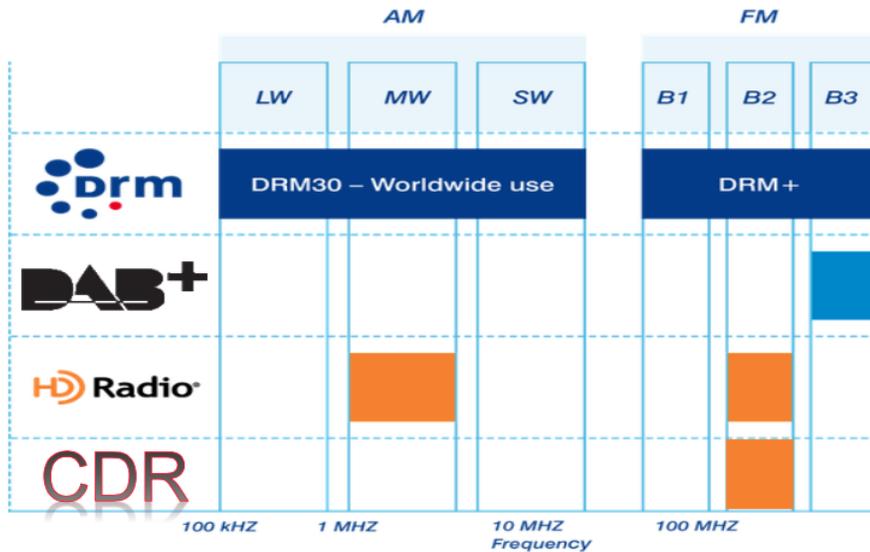
Parameter	FM	HD Radio	China Digital	DRM+	DAB+
Frequency	87.5 MHz – 108 MHz Band II	55kHz - 1705kHz 87.5 MHz – 108 MHz	87.5 MHz – 108 MHz Band II	47 MHz – 68 MHz 87.5 MHz – 108 MHz 174MHz – 230 MHz	174 MHz – 240 MHz Band III
Programs / Channel	1	1 to 4 (max)	1 to 4 (or More)	1 to 4 (max)	Typically 9 to 24 (64 max)
Data / Channel	RDS 1,2 kBit/s	Flexible Program Associated and Non Program Associated Data rates	Flexible Program Associated and Non Program Associated Data rates	Flexible Program Associated and Non Program Associated Data rates	Flexible Program Associated and Non Program Associated Data rates
Analog Simulcast	N/A	Yes	Yes	Yes*	No
Channel	200 kHz	400kHz	400kHz	96 kHz	1.5 MHz
BW Capacity	N/A	96/124 kBit/s	96 kBit/s-1.5 Mbits/s	96/kBit/s	1.5 Mbits/s
Modulation	Single Carrier FM  -100 kHz +100 kHz	Multi-carrier (up to 524) OFDM, 4 QAM  -200 kHz +200 kHz	Multi-carrier (up to 524) 4,8,16,32,64 QAM  -200 kHz +200 kHz	Multi carrier (106) OFDM, 4 or 16 QAM  -48 kHz +48 kHz	Multi Carrier (1536) OFDM, type DQPSK  -768 kHz +768 kHz

Proprietary and confidential. | 3

Connecting What's Next



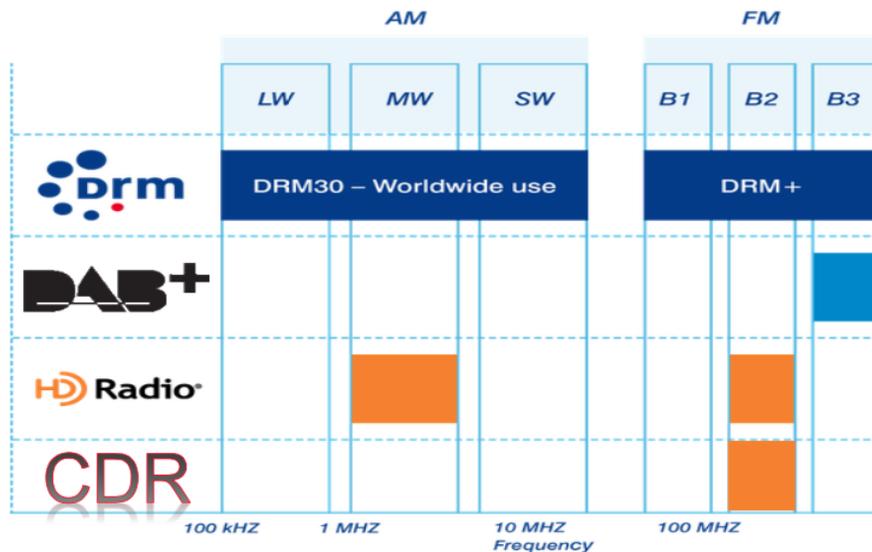
Digital Radio Standards IBOC & DAB+



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Connecting What's Next





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?

Answer:

The best way to approach this would be by providing an unused spectrum space or reallocating a new spectrum space for a non-unified technology transmission to carry on., such as Band III or between 47Mhz to 68 Mhz., While this carries a risk of multiple frequency auctions, it reduces the conflicts and interference issues that can occur in long run.

However, for the next phase of digitization, it is highly advisable to choose DRM / DRM+ as a unified and only digital transmission standard since it is most versatile/flexible and least interference prone transmission with a limited channel space.

8) Should the permission for operating FM channel be delinked from technology used for radio broadcasting? If yes, please provide a detailed framework with justification.

Answer: Yes., By delinking the permissions for operating with technology we provide an opportunity for both the broadcasting station and the listener to enjoy the latest and greatest improvement in technology without the bureaucratic process that often delays this change.

To begin with the regulatory body needs to be created to assess all the faces of such a delink process and then build a most versatile yet comprehensive regulation manual to delink the regulation of FM channel from the radio broadcasting technology.

This includes a body created with experts across domains covering but not limited to Radiobroadcasters (private and public), Advertisement agencies, Equipment manufacturers, BECIL, Smart phone manufacturers as the era we live in has a synergy between these players to create a meaningful and successful community.

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.

Answer: Yes, you should allow existing operational FM radio channels to migrate to digital broadcast within an assigned radio frequency. Because people are well known to frequency band instead of broadcaster name like 92.7, 93.4 etc. this could help FM radio broadcaster to hold their fame in market and save the marketing cost. Obviously when FM radio broadcasters migrate to digital broadcasting will enable them to get multiple addition value added service with additional channel capacity. But migration is not so easy part for broadcaster, to boost them for migration you have to cater certain benefits to them, so up to some extent shouldn't be additional charges for broadcaster even though number of available channels increase. When migration to digital broadcasting will do successfully then start charging for each channel in frequency allocation.

10) Should the future auction of remaining FM channels of Phase-III be done delinking it from technology adopted for radio broadcasting? Please give your suggestions with detailed justification.

Answer: Not Necessarily., but it is very advisable to do so., to prevent legality issues and financial burden on the new players to be impacted from such a change in short duration after auction.

11) In case future auction of remaining FM channels of Phase-III is done delinking it from technology, should the present auction process be continued? If no, what should be the alternate auction process? Please give your suggestions with detailed justification.

Answer:

12) What modifications need to be done in FM radio policy to use allocated FM radio channels in technology neutral manner for

Radio broadcasting?

Answer: Technology neutral will be able to enable radio broadcaster to think of allocated frequency spectrum utilization. When comes to FM radio policy should encourage broadcaster to do more research on further development of spectrum utilization. Currently TRAI has a many regulation and limitation on complete utilization of frequency band which is allocated to broadcaster.

The radio policy should not be stagnant, has the trend changes with a new technology, policy has to fit for those new technologies. One thing TRAI has to keep updated with new upcoming technologies and make it standard for all broadcaster else allow broadcaster update.

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

Answer:

- Introduce digital radio receivers in smart phone.
- Set a deadline for migration
- Showcase the future business in digital radio and involve multiple player into manufacturing field
- Attract more listener by providing best useful programs and content digitally

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

Answer: