

Mr Shri Deepak Sharma  
Advisor (B&CS)  
Telecom Regulatory Authority of India

Your ref: VHF Consultation

Our ref: P3349-L-004 v1.1

By email

11 November 2024

Dear Mr Sharma

### TRAI Consultation on VHF Digital Radio

Thank you for the opportunity to place our arguments concerning possible technology standards for digital radio in the VHF Band II ('FM radio') spectrum.

Cambridge Consultants provides design and development services alongside technology strategy support in a number of areas including radio system design and consumer electronics.

Our responses to the two key questions relating to VHF digital radio are:

#### **Q1 Do you agree that single digital radio technology adoption is preferable for entire country?**

There are at least four arguments in favour of a single digital technology in India:

- A single technology standard will give **more confidence to the market** to invest in that technology ecosystem.
- At the moment there are **no platforms supporting more than one** of the viable standards, therefore at least a year's development will be required before consumer equipment could be available. This would be a particular problem for car radios, where further development is often required before deployment in production vehicles.
- A multi-standard radio would have to involve cooperation of the radio's development team with multiple intellectual property owners, and involve potential contradictions of requirements (for example, the RF front-end bandwidth) between standards. This is likely to cause further **cost and delay to development**.
- Multiple intellectual property licences would be required for a multi-standard radio, which will **increase the unit cost** of receivers, as well as increasing development cost and complexity.

#### **Q2. In case a single digital radio broadcast technology is to be adopted for the entire country, which technology should be adopted for digital radio broadcasting?**



As engineering experts with considerable knowledge of radio modem design and implementation, we can advise that **Digital Radio Mondiale** is the most spectrally-efficient and energy-efficient of the proposed systems. It offers multiple advantages, including:

- Much of the Digital Radio Mondiale receiver expertise already resides in India, keeping essential **engineering know-how and technology in the country**.
- A robust Emergency Warning Function is built-in to Digital Radio Mondiale, and **all receivers on the market implement it**. (This is not true for either DAB or HD Radio.)
- No essential intellectual property licence is required, apart from the AAC codec system (which is also required for most other platforms, including DAB, DVB and most mobile phones). One of the module-level solutions on the market bundles the AAC licence with the unit price, allowing a radio manufacturer to **access the technology without need for legal agreement** of any kind.
- Very low-powered receiver implementations are now available at low cost.
- In India, several million Digital Radio Mondiale receivers **are already in use**, either already capable of receiving at VHF Band II, or with a software upgrade capability to add this.
- In VHF Band II, Digital Radio Mondiale multiplexes can be placed in adjacent channels without guard-bands, and each multiplex requires only 100kHz bandwidth. This allows **existing receiver front-end designs and transmitters to be used** without modification.

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Yours sincerely,

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