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Date: 11/07/2024

The Chairman,  
Working Group -1, NFAP 2022 review/revision committee,  
Government of India  
Ministry of Communications & IT,  
Department of Telecommunications  
Wireless Planning & Coordination Wing  
Sanchar Bhawan, New Delhi – 110001

**Kind Attn: Mr. Viresh Goel**

Subject : Our submissions for NFAP 2022 review

Dear Sir,

In reference to NFAP meeting held on 03/07/2024 & 09/07.2024, and the submissions made by various stake holders we wish to place before you our views and concerns on some of the suggestions made. Our submissions and remarks are preliminary in nature, and we shall further revert after undertaking thorough studies. Our topics of submission include the below...

- Frequency band - PMRTS/ CMRTS (Digital and Analog)
- PMRTS Applications for mission critical services
- Modifications suggested in NFAP2022 foot note
- Countries using similar applications, with web links
- International practices - Radio regulations and provisions
- PPDR frequency bands earmarked for use across different countries

Please feel free to call on us for any further clarification, and we look forward to interacting with you during our next scheduled meeting.

Thanks & Regards,

**For Aryaomnitalk Radio Trunking Services Private Limited**

(AVS RAO)

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**Arya Omnitalk Radio Trunking Services Private Limited**

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### Format

<b>Contribution for updating National Frequency Allocation Table-2022 (up to 1 GHz band)</b>		
1	Name of Individual/Organization etc	<b>ARYA OMNITALK RADIO TRUNKING SERVICES PRIVATE LIMITED</b>
2	Address	Unit No.202, 2 <sup>nd</sup> Floor, Summer Court, Magarpatta City, Pune – 411013 Maharashtra - India
3	Mail ID	<a href="mailto:avs.rao@aryaomnitalk.com">avs.rao@aryaomnitalk.com</a> ; <a href="mailto:abahal@aryaomnitalk.com">abahal@aryaomnitalk.com</a> ; <a href="mailto:vmalhotra@aryaomnitalk.com">vmalhotra@aryaomnitalk.com</a>
4	Phone/Mobile no.	Mobile +91-7028257524 ; +91-9810412723 & +91 9545513400
5(a) *	Nature of business	Service Operator - PMRTS
5 (b)	Type of Organisation (Pvt industry, Association, academia, PSU, government departments etc.)	Private Industry
6	Frequency band (kHz/MHz)	<p>As per IND-18 of NFAP 2022 following Frequency band are for PMRTS:            336-338 MHz paired with 346-348 MHz :<i>No deployment for PMRTS</i>            338-340 MHz paired with 348-350 MHz : One block issued in each of 7 cities from Kerala Circle (i.e. Quilon, Alappuzha city, Ernakulum city, Munnar City, Payyanur city, Trichur cities.)            811-814 MHz paired with 856-859 MHz –<i>Deployed for Digital PMRTS – Awaiting widespread deployment pending notification of new Telecom bill passed by Parliament</i>            814-819 MHz paired with 859-864 MHz: Extensively deployed for Analog PMRTS. Details available with DoT. <i>Awaiting widespread deployment pending notification of new Telecom bill passed by Parliament</i>            819-824 MHz paired with 864-869 MHz : <i>Predominantly for CMRTS (Captive Mobile Trunked Radio deployments).</i>Details available with DoT</p> <p><i>There are over 60,000 Radio users and 400+ RF channels in expensive Equipment Infrastructure deployed in the 811-814 MHz (856-859 MHz) as well as 814 MHz- 819 MHz (859MHz-864 MHz) bands across India</i></p> <p><i>Over 300 applications for new frequency allocation from PMRTS Operators were last pending with DoT pending their decision on whether PMRTS should be assigned Spectrum administratively or through auction. The new Telecom bill passed by the Parliament is pending notification for administrative assignment of Spectrum.</i></p> <p><i>Similarly, there are over 100,000 plus Radios deployed all over India under various Trunked Radio Technology platforms like APCO 25, TETRA, DMR I, II &amp; III under Captive and CMRTS licensing, many of which are using the 800 MHz band, especially 819-824 MHz Exact details available with DoT</i></p>
7*	Applications of service	PMRTS, Two-Way, Push-To-Talk Radio communication on Handheld radios, Fixed/ Base radios, and Vehicle Mounted radios

8	Minimum & Maximum power with unit	1W to 3W for Handheld Radio 15 W to 30 W for Mobile/Vehicle Mounted Radios 75W to 100 W for Transmission from Base Station/Repeater
9	Purpose	Mission Critical Push-To-Talk Communication for Municipal Corporations for disaster management and recovery, Public Sector Companies in the Oil & Gas sector like IOCL,BPCL,HPL,ONGC for maintenance and day to day operations, Public Utility agencies like Electricity Boards for maintenance and day to day operations, Public Safety agencies for policing, Emergency Response Service agencies including Ambulance services ,Indian Naval Shipyards, Ports for loading & unloading, shipping & stevedoring operations, Airports for ground operations, Security Services for patrolling and surveillance across Public & Private Sector Enterprises, construction of high rise buildings higher than ten floors, Ready Mix Concrete Industry, Malls for Security, parking management & maintenance operations etc. etc.
10 (a)	Countries in which similar applications are used along with web link (if known)	Malaysia, United States, UK, Singapore, Israel, New Zealand, Australia,Indonesia, South American nations such as Brazil etc....  <a href="https://www.mcmc.gov.my/skmmgovmy/media/General/pdf/Trunked_Radio_Going_Digital_2_compressed.pdf">https://www.mcmc.gov.my/skmmgovmy/media/General/pdf/Trunked_Radio_Going_Digital_2_compressed.pdf</a> <a href="https://www.telco.nsw.gov.au/">https://www.telco.nsw.gov.au/</a> <a href="https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-M.2014-3-2016-PDF-E.pdf">https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-M.2014-3-2016-PDF-E.pdf</a>
10 (b)	Provisions in frequency allocation table along with footnote of the country along with web link (if known)	380MHz to 385MHz – Malaysia... 410MHz to 430MHz – Malaysia... 694MHz to 790MHz- Spain... 811MHz to 814MHz India (PMRTS digital), United States... 814MHz to 819MHz India (PMRTS Analog), United States... <a href="https://www.mcmc.gov.my/skmmgovmy/media/General/pdf/Trunked_Radio_Going_Digital_2_compressed.pdf">https://www.mcmc.gov.my/skmmgovmy/media/General/pdf/Trunked_Radio_Going_Digital_2_compressed.pdf</a> <a href="https://www.mdpi.com/2076-3417/9/2/250/pdf">https://www.mdpi.com/2076-3417/9/2/250/pdf</a>  <b>United States:</b> <a href="https://www.law.cornell.edu/cfr/text/47/90.7">https://www.law.cornell.edu/cfr/text/47/90.7</a>  <a href="https://docs.fcc.gov/public/attachments/FCC-90-234A1.pdf">https://docs.fcc.gov/public/attachments/FCC-90-234A1.pdf</a>  <b>Australia:</b> <a href="https://www.fcc.gov/wireless/bureau-divisions/mobility-division/specialized-mobile-radio-service-smr">https://www.fcc.gov/wireless/bureau-divisions/mobility-division/specialized-mobile-radio-service-smr</a>  <a href="https://www.law.cornell.edu/cfr/text/47/90.631">https://www.law.cornell.edu/cfr/text/47/90.631</a>  <a href="https://www.acma.gov.au/sites/default/files/2019-11/RALI-LM3.pdf">https://www.acma.gov.au/sites/default/files/2019-11/RALI-LM3.pdf</a>  <a href="https://www.acma.gov.au/technical-details-land-mobile-licences">https://www.acma.gov.au/technical-details-land-mobile-licences</a>  <b>New Zealand:</b> <a href="https://www.rsm.govt.nz/assets/Uploads/documents/pibs/radio-licence-policy-rules-pib-58.pdf">https://www.rsm.govt.nz/assets/Uploads/documents/pibs/radio-licence-policy-rules-pib-58.pdf</a> <b>Singapore:</b> <a href="https://www.imda.gov.sg/-/media/imda/files/regulation-licensing-and-consultations/frameworks-and-policies/spectrum-management-and-coordination/spectrumgmthb.pdf">https://www.imda.gov.sg/-/media/imda/files/regulation-licensing-and-consultations/frameworks-and-policies/spectrum-management-and-coordination/spectrumgmthb.pdf</a>

11	Radio Regulations provisions (if known)	<p>Kindly refer INTERNATIONAL PRACTICSE section at below</p> <p><u>Ref. for Point#11 above --- Radio Regulations provision (if known)</u></p> <p style="text-align: center;"><b>INTERNATIONAL PRACTICE</b></p> <p><b>Singapore</b></p> <p>4.1 According to the Spectrum Management Handbook<sup>9</sup> issued by IMDA (Infocomm Media Development Authority) in July 2017, for providing Public Trunk Radio Service (PTRS} , the operators are required to take FBO (Facilities-Based Operations) license<sup>10</sup> The duration of the license is 10 years and renewable for a further period, if required. The license fee is an Annual Fee<sup>11</sup> of S\$80,000 for the first S\$50 million in AGTO (AnnualGross Turnover)<sup>12</sup>. 0.8% of AGTO for the Next S\$50-S\$100 million in AGTO and 1% of AGTO for the above S\$100 million in AGTO.</p> <p>4.2 IMDA was of the view that the trunked radio features have not been replaced by cellular services. The ability to make one-to-many group calls using trunked radio is a feature in which cellular networks have yet to offer. One-to-many group calls are crucial for operations that require information to be verbally communicated to all field staff in different locations simultaneously.</p> <p>4.3 IMDA's policy is to assign the spectrum allocated for public mobile services to FBOs only. Administrative-based approach is being used for spectrum allocation for PTRS. IMDA is of the view that it will continue to use administrative-based approach for services such as paging, trunked radio, fixed links, etc., till such time when there are competing demands for the spectrum.</p>									
12*	Type of Radiocommunication service	Public Mobile Radio Trunking Service									
13	Compatible Wireless Standard for the device likely to work in the proposed band ( ETSI, 3GPP, IEEE, EC, FCC ,TEC etc or any proprietary standard)	PMRTS, since it has to operate in dense urban environments and for legacy reasons as well as based on availability of equipment, needs to continue operation in the existing 800MHz bands - <i>811-814 MHz(856-859 MHz) as well as 814 MHz- 819 MHz (859MHz-864 MHz)</i> , and no changes are suggested considering the size of industry, existing population of analog and digital radios and the replacement cost of new infrastructure equipment deployed under both PMRTS and CMRTS.									
14	Benefit for public	<p style="text-align: center;"><b>A) Trunked Radio User Groups</b></p> <p>There are a variety of user groups from various industry verticals who find PMRTS invaluable., These are:</p> <table border="1" data-bbox="512 1901 1497 2130"> <thead> <tr> <th></th> <th>Industry Vertical</th> <th>PMRTS/Trunked Radio Application</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Oil &amp; Gas</td> <td> <ul style="list-style-type: none"> <li>• Maintenance during shut down</li> <li>• Emergency &amp; disaster management operations</li> <li>• Intrinsically safe radios given hazardous environment</li> </ul> </td> </tr> <tr> <td>2.</td> <td>Municipal Corporations</td> <td> <ul style="list-style-type: none"> <li>• Co-ordination of Operations in the Fire Dept., Solid Waste Management, Octroi.</li> </ul> </td> </tr> </tbody> </table>		Industry Vertical	PMRTS/Trunked Radio Application	1.	Oil & Gas	<ul style="list-style-type: none"> <li>• Maintenance during shut down</li> <li>• Emergency &amp; disaster management operations</li> <li>• Intrinsically safe radios given hazardous environment</li> </ul>	2.	Municipal Corporations	<ul style="list-style-type: none"> <li>• Co-ordination of Operations in the Fire Dept., Solid Waste Management, Octroi.</li> </ul>
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2.	Municipal Corporations	<ul style="list-style-type: none"> <li>• Co-ordination of Operations in the Fire Dept., Solid Waste Management, Octroi.</li> </ul>									

3.	Public Utilities	<ul style="list-style-type: none"> <li>Disaster Management</li> <li>Maintenance, troubleshooting &amp; repair</li> </ul>
4.	Shopping malls	Security & Maintenance, Parking management
5.	Construction	Co-ordination of men, materials, money, or machines. for construction of high rise buildings
6.	Hotels	Security & maintenance services
7.	Manufacturing	Security & co-ordination of day-to-day operations
8.	Pharmaceuticals	Intrinsically Safe Radios for co-ordination of day-to-day operations where no cell phones are allowed because of hazardous environment
9.	Airlines/Airports	Day to day management of multiple agencies & ground operations
10.	Property management	Large campus patrolling for better security & disaster preparedness.
11.	Private Security	Security & Safety of High-net-worth Individuals
12.	Ambulance / Mobile Medical Services	Co-ordination for emergency pick-up for golden hour
13.	Education	Security & disaster preparedness
14.	Banks	Alternative Channel of Communication especially during floods, natural or man made disasters.
15.	School bus transport	Safety & security of school children.
16.	Armed Forces (Defense, Navy.)	Requirements for better disaster preparedness.
17.	Ports	For container loading and unloading operations , day today port management and security operations

The above is a limited list of user groups of PMRTS. The key commonality of communication needs amongst the user groups above is:

- a) Instant mission critical communication at the press of a PTT button (Push-to-Talk).
- b) Frequent short bursts of communication
- c) Multiple Talk Groups for one-to-many or one-one communication, while on the move

Trunked Radio is the ideal communication device for the applications above since:

- It involves no dialing (just Push-to-Talk). Given that an average PTT conversation is a few seconds, imagine how tedious it would be to make 8-10 calls to someone within a minute by a cell phone.
- In the event of a man made or natural disaster, cell phone networks get jammed or in-operational. Therefore, for mission critical communications, a cell phone will simply not be able to do the job
- International safety agencies mandate use of PMRTS like radio communication for fire safety because of its ability to alert for evacuation or management hundreds of users instantly and at the same time, which no other communication device can do. In such situations there is no time to dial or to wait to connect.
- PMRTS is the most spectrum efficient service. There is no network congestion or network jamming because the infrastructure is geared to support multiple users across multiple talk groups in a semi-duplex mode, with severely restricted one way PSTN connectivity. Typical loading norms defined by DoT for analog PMRTS support 90 radio users per channel and Digital PMRTS @ 180 users per channel

15	If modification in NFAP-2022 footnote then quote relevant footnote no. of NFAP-22	<p>Existing PMRTS operators are using 25 KHz channeling plan No. 6 on NFAP. We further recommend that in order to accommodate different digital technologies having Channel bandwidth of 25 KHz- 4 slot TDMA /Channel bandwidth of 12.5 KHz 2 slot TDMA/Channel bandwidth of 12.5 KHz FDMA/ Channel bandwidth of 6.25 KHz FDMA available in the market, the band may be further subdivided into smaller bands for different technologies requiring three different channel bandwidths of 25 KHz/12.5 KHz and 6.25 KHz i.e. one sub band for each of the three technologies i.e. 25 KHz Channel bandwidth (Tetra/APCO 1) /12.5 KHz Channel Bandwidth (DMR, NXDN and APCO Phase II) and 6.25 KHz channel bandwidth technology (dPMR, NXDN)</p> <p>PMRTS industry categorically endorses the above recommendations and urges TRAI and DOT to ensure their urgent and immediate implementation to help the industry to migrate from Analog to the long-awaited Digital Infrastructure.</p> <p>Since analog infrastructure equipment has long been unavailable, we recommend that all new or additional assignment of carriers for the existing analogue system with a Carrier width of 25 KHz shall no longer be required. A 25 KHz Carrier being used by present analogue system can be counted as 4 carriers of 6.25 KHz each for the purpose of collecting royalty for spectrum usage from PMRTS operators.</p> <p>Immediate measure required by DOT is to put in place a frequency allocation plan for Digital PMRTS for 6.25 KHz, 12.5 KHz and 25 KHz channel spacing with required threshold adjacent channel spacing (depending on Digital technology deployed) and urgent assignment of above spectrum to PMRTS operators even if it has to be on an interim/provisional basis, without waiting either for new TRAI recommendations (based on conclusion of this Consultation Paper) or the New Telecom Bill. As it is, DOT is assigning spectrum on a provisional/ Interim basis to CMRTS (Captive Mobile Radio Trunking Service) and Captive users based on an undertaking that the recipient company shall pay the final price of spectrum as determined by DOT.</p> <p>We strongly urge the Authority to restore a level playing field for the PMRTS industry which for the last 9 years has been distorted unjustifiably in favor of PMRTS alternatives and substitutes i.e., CMRTS and Captive Radio users, despite PMRTS being more spectrum efficient.</p>
16	Remarks	<p>In today's NFAP Working Committee meeting, remarks were made by a Chennai based Company on reserving 10 MHz of contiguous spectrum in the 814-824 MHz( 859MHz-869 MHz) band for PPDR operations. No details have been furnished either w.r.t. the equipment developed for same i.e. technology deployed, carrier width, equipment specifications, TEC approvals /Equipment Type Approvals etc. as also justification for why the proposed 800 MHz band is required, or on what basis a large chunk of 10 MHz spectrum should be reserved and why contiguous spectrum only is required.</p> <p>At the same time the 800 MHz band as highlighted above is already subject to widespread use by the PMRTS and the CMRTS Industry for over 100,000 users across more than 500 RF Channels deployed in expensive Infrastructure equipment which cannot be disturbed.</p>


A cursory search on the said Chennai based Company's web site neither revealed any equipment details including technology used / specifications /frequency band, nor any product certifications from TEC or even a BIS approval certificate. Also details obtained from the Registrar of Companies website show that the said Chennai based Company *have no revenues from any equipment produced or sold by them as on 31<sup>st</sup> March 2023.*

In addition there is no other stakeholder of repute with credentials of any successful deployment of PPDR on the ground, that has either demonstrated availability of any PPDR equipment with them or showcased any credible technology in the frequency band suggested to be reserved or furnished any deployment details of the said PPDR technology in India or overseas. No details have also been furnished on any pilot installations of PPDR equipment along with user feedback for the same. Our humble submission is why we are even considering reserving a large slice of spectrum already in widespread use, for a product or application which is merely an intent today, with no underlying data on pilot, commercial or even trial deployments and without even any theoretical /academic details of the underlying technology to be deployed?

In conclusion, we submit that the new PPDR technology in the making may be either encouraged to use a spectrum band which does not conflict with spectrum bands already in extensive and widespread use by the PMRTS and CMRTS Industry already or at best use any other spectrum / frequency band that the NFAP forum may deem fit without causing any conflict, after sufficient justification and credentials of user acceptance for PPDR application , technology and equipment credentials have been furnished.

Notwithstanding above, we reproduce below some extracts from an ITU recommendation document for alternative frequency bands for your consideration, in lieu of the requested 800 MHz band (*please refer embedded file ITU recommendations*):

- The frequency range 380-399.9 MHz has been identified for narrowband PPDR operations in Malaysia. Part of this frequency range is used for PPDR operations in Malaysia.(Page 32)
- PCC.II/REC. 16 (VII-06): Use of the 4 940-4 990 MHz band in the Americas for Public Protection and Disaster Relief. (Page 27)
- The frequency range 351-370 MHz has been identified by the Ministry of Industry and Information Technology of the People's Republic of China for narrowband PPDR operations (page 29)
- The frequency range 380-470 MHz has been identified as a tuning range for PPDR in Region 1. The frequency band 380-385 MHz (uplink)/390-395 MHz (downlink) is the harmonized core band for permanent use for PPDR. For more information relating to countries within Europe, see ECC/DEC/(08)05 and ECC Report 102
- Harmonized frequency arrangements within the bands 694 to 791 MHz in accordance with the Arab States harmonized measures for broadband PPDR

		<ul style="list-style-type: none"> <li>• The frequency range 380-399.9 MHz has been identified for narrowband PPDR operations in Qatar. Part of this frequency range is used for PPDR operations in Qatar.</li> <li>• The Narrowband PPDR channeling plan for frequency arrangement 414.0125-414.1000 MHz currently used in New Zealand for simplex services.</li> <li>• Frequency arrangements within the frequency range 723 to 788 MHz in some countries of Region 1 for broadband PPDR</li> </ul> <div style="text-align: center;">  <p>ITU PPDR Recommendations.pdf</p> </div>
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Note.

5\* . Construction service / Manufacturing service/ Shipping Service/Aeronautical Service etc

7\* . Specify the operation of service (e.g Hand held radio/ Vehicle mobile radio/ point to point links/FM/Community Radio/Aeromobile/Short Rang Device etc

12\* Amateur/Fixed/Land mobile/Aeronautical mobile/Maritime Mobile/Aeronautical radio navigation/FM broadcast/Community Radio Service etc

Date and Signature