

Revised Reasoned Document for Item VHF SETS TO BE USED ON INDIAN RAILWAYS as per RDSO/SPN/TC/107-2018 based on the comments received on DRAFT of Ver. 2.0 from various stake holders

SN	Clause no	Original as per Ver. 1.0	As proposed in Draft of Ver. 2.0	COMMENTS RECEIVED from	RDSO's View	Amended Clause proposed in revised final draft-d2
			Note: changes w.r.t. ver. 1.0 are reflected in RED	SCR CR WR NWR SER TCSC M/s Vertel M/s Sanchar Communication M/s Iconet Services		Changes w.r.t. DRAFT is additionally highlighted in RED (If any).
1.	3.4	The set should have 'battery low" indication/announcement regarding battery status for early warning to the user.	The set should have 'battery low alert in the form of audio alert or visual indication or both /announcement regarding battery status when battery reaches a certain minimum level (say 20%) for early warning to the user.	CR The set should have "battery low" alert in the form of audio alert and visual indication.	Partially agreed. Battery low alert by means of any one of audio or visual suffice the requirement. If both audio and visual alert is made necessary, it may restrict the vendor base.	The set should have 'battery low alert in the form of audio alert or visual indication or both /announcement regarding battery status when battery reaches a certain minimum level (say for example 20%) for early warning to the user.

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2.	4.0	Quick battery charger shall be Radio OEM recommended and BIS approved. Battery charger should give DC voltage as required for charging the battery of VHF set from input voltage of 230 ± 10%, 50 Hz. The charging time should be 2 to 4 hours for charging batteries upto 3000mAh in case battery is fully discharged. The charger should have visual indication to indicate the power ON, OFF, battery charging under progress and fully charged condition of the battery.	4.0 Battery Charger: Quick battery charger consists of adapter and charging tray unless both are integrated as a single unit and shall be recommended by Radio OEM. Adapter shall be BIS approved. Quick battery charger/Adapter shall be Radio OEM recommended and BIS approved. Battery charger/adapter should give DC voltage as required for charging the battery of VHF set from input voltage of 230 ± 10%, 50 Hz. The charging time should be 2 to 4 hours for charging batteries upto 3000mAh in case battery is fully discharged. The charger should have visual indication to indicate the power ON, OFF, battery charging under progress and fully charged condition of the battery.	M/s Vertel: Quick Battery Charger shall be Radio OEM recommended and BIS approved. Adaptor of Battery Charger should be Radio OEM recommended and BIS approved.	If adapter and charging tray both are integrated as a single unit then complete unit should be OEM recommended and BIS approved. However, if adapter and tray are separate units, it should be OEM recommended and adapter should be BIS approved. Sentence reframed to clarify it further. Clause is divided in sub-clauses for better understanding.	4.0 Battery Charger: 4.1 Quick battery charger may consist of adapter and charging tray as separate units or both may be integrated as a single unit and shall be recommended by Radio OEM. Adapter shall be BIS approved. Quick battery charger/Adapter shall be Radio OEM recommended and BIS approved. In case of single unit, it should be radio OEM recommended and BIS approved. In case of separate units, it should be radio OEM recommended and adaptor of the battery charger shall be BIS approved. 4.2 Battery charger should give DC voltage as required for charging the battery of VHF set from input voltage of 230 ± 10%, 50 Hz. 4.3 The charging time should be 2 to 4 hours for charging batteries upto 3000mAh in case battery is fully discharged. 4.4 The charger should have visual indication to indicate the power ON/OFF, battery charging under progress and fully charged condition of the battery.

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3.	5.2.1	Power output at antenna port : 5 Watt Programmable to 1 Watt	Power output at antenna port ÷ 5 Watt Programmable to 1 Watt if high is selected, it shall be 5 watt and if low is selected it shall be 1 watt. Selection can be switchable or programmable. Tolerance of $\pm 2.5\%$ is acceptable.	TCSC During discussion in TCSC it was suggested to remove 1 W option.	Agreed. Clause being reframed.	Power output at antenna port: 5 Watt , tolerance of -2% is acceptable. Programmable to 1 Watt If high is selected, it shall be 5 Watt and if low is selected it shall be 1 Watt . Selection can be switchable or programmable. A tolerance of -2% in case of 5W and $\pm 2\%$ in case of 1W is acceptable.
4.	5.2.7	Spurious emission: Better than 70 dB.	Spurious emission: Better than 70 dB	M/s Sanchar Communication: Should be 60 dB as per MHA doc.	Not agreed. Not mentioned in MHA doc.	No change.
5.	5.2.8	Hum & Noise : -34dB @12.5 KHz,	Hum & Noise : -34dB @12.5 KHz	M/s Sanchar Communication: Change -40 dB@12.5 KHz as per MHA Docs. Page 7 Point 2(ii)	Not agreed.	No change.
6.	5.3.1	Sensitivity : Better than 0.25 μ V for 12dB SINAD	Sensitivity: Better than 0.25 μ V for 12dB SINAD	M/s Sanchar Communication: Analog 0.30 μ V for 12dB SINAD or better	Better sensitivity will increase the range, hence 0.25 μ V is OK	No change.

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7.	5.3.5	AF Response: Shall be between +1 dB & -3 dB over the frequency range 300-2700 Hz with 1 KHz as ref.	AF Response: Shall be between +1 dB & -3 dB over the frequency range 300-2700 Hz with 1 KHz as ref.	M/s Sanchar Communication: May be changed to +1 dB & -3 dB over the frequency range 350-2700 Hz with 1 KHz as ref.	Agreed	AF Response: Shall be between +1 dB & -3 dB over the frequency range 300 350-2700 Hz with 1 KHz as ref.
8.	5.4.1	The Walkie-Talkie Sets shall be provided with short helical spring antenna with suitable connector with socket mounted on PCB.	The Walkie-Talkie Sets shall be provided with short helical spring antenna with suitable connector with socket mounted on PCB	WR High gain antenna is recommended to incorporate in the specifications	Not Agreed. Practically high gain antennas are Directional antennas whereas Walkie-Talkie sets require Omni-directional antenna.	No change.
9.	5.6.7 vi	Low battery alert	Low battery alert	M/s Vertel It should be deleted	As this parameter is already covered in clause no. 3.4 so to avoid the duplicity, this clause is already deleted in draft of Ver. 2.0.	No change.

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10.	5.6.7 vii	Battery level announcement at least in three steps/ three levels LED light indicator.	Battery level announcement at least in three steps/ three levels LED light indicator. Provision should be there for battery level audio announcement in at least three steps or battery level LED light indicator in at least three steps as and when desired by user.	M/s Vertel Provision should be there for battery level audio announcement in at least three steps or battery level LED light indicator in at least three steps.	Agreed	Battery level announcement at least in three steps/ three levels LED light indicator. Provision should be there for battery level audio announcement or LED light indicator in at least three steps. or battery level in at least three steps as and when desired by user.

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11.				<p>M/s Sanchar Communication: It is requested to keep battery level audio announcement in single step battery level LED Light indicator in two steps, such technology is followed for last many years and for changing such feature, new hardware /software is required to be design for mostly all indian manufacturers. Keeping in view kindly amend.</p>	Not Agreed.	
12.	5.7.1	Power output at antenna port : 5 Watt Programmable to 1 Watt	Power output at antenna port ÷ 5 Watt Programmable to 1 Watt if high is selected, it shall be 5 watt and if low is selected it shall be 1 watt. Selection can be switchable or programmable. Tolerance of ±2.5% is acceptable.	<p>M/s Vertel It should be modified and tolerance of 2.5 % in high and low RF wattage should be included</p>	In view of restriction of WPC for transmitted power, + side tolerance is being removed from 5 Watt. Clause being reframed accordingly.	Power output at antenna port:-5 Watt, tolerance of -2% is acceptable. Programmable to 1 Watt If high is selected, it shall be 5 Watt and if low is selected it shall be 1 Watt. Selection can be switchable or

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13.				SCR If high is selected, it shall be 5 watt and if low is selected it shall be 1 watt. Selection can be switchable or programmable. Tolerance of $\pm 2.5\%$ is acceptable.	Tolerance of 2% is OK.	programmable. A tolerance of $\pm 2\%$ in case of 5W and $\pm 2\%$ in case of 1W is acceptable.
14.				TCSC During discussion in TCSC it was suggested to remove 1 W option.	Agreed. Clause being reframed.	
15.	5.7.2	Frequency stability : ± 0.5 PPM	Frequency stability : ± 0.5 PPM	M/s Sanchar Communication: May be amend to ± 1.5 PPM as per MHA Docs Page no 6 Point no 1(iV)	Not Agreed as per MHA Docs Page no 11 Point no 1.4.	No change.

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16.	5.7.4	Digital protocol: ETSI DMR Open standard (OEM should be Category-1(Manufacturer Status) member of DMR association). OR Walkie-Talkie sets should be interoperable with walkie-talkie sets of any OEM having IOP certification of DMR association and have supplied their walkie-talkie sets in Indian Railways.	Digital protocol: ETSI DMR Open standard (OEM should be Category-1(Manufacturer Status) member of DMR association). Set shall have IOP certification issued by DMR association. OR Walkie-Talkie sets should be interoperable with walkie-talkie sets of any OEM. having IOP certification of DMR association and have supplied their walkie-talkie sets in Indian Railways.	SCR ETSI DMR Open standard (OEM should be Category-1(Manufacturer Status) member of DMR association). Set shall have IOP certification issued by DMR association. OR Walkie-Talkie sets should be interoperable with walkie-talkie sets of any OEM having IOP certification of DMR association and have supplied their walkie-talkie sets to any Government Organisation duly certified by an officer of not less than JAG level.	IOP with sets supplied to IR is necessary. Condition of supply to any govt agency is irrelevant. Clause redrafted for more clarity.	Digital Protocol: 5.7.4.1 Digital protocol shall be ETSI DMR Open standard and OEM should be Category-1 (Manufacturer Status) member of DMR association. 5.7.4.2 Set shall have IOP certification issued by DMR association. OR Walkie-Talkie sets should be interoperable with walkie-talkie sets of any OEM. having IOP certification of DMR association and have supplied their walkie-talkie sets being used in Indian Railways.

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17.				<p>M/s Vertel As per RDSO suggestion in the draft specification It should be -- ETSI /DMR open standard (OEM should be Category-1 (Manufacturer Staus). Set shall have IOP certification issued by DMR association. OEM set should have been supplied the equipment to any government organization in last 1 Year, Otherwise how new models of various OEM will get inducted in Railways.</p>	<p>IOP with sets supplied to IR is necessary. Condition of supply to any govt agency is irrelevant.</p>	

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18.				<p>M/s Sanchar Communication: Kindly arrange to clarify whether Indian manufacturer needs to obtain IOP certification from TWG or the Manufacturer's walkie talkie should be compatible with radio that Railways are already using, more ever kindly refer document dated 30-01-20 stating no need of IOP certification from TWG released by DCPW.</p>	<p>Set should have either IOP certification or set should be interoperable with sets already in use in IR.</p>	

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19.	5.7.5	Vocoder type : AMBE+2	Vocoder type : AMBE+2	M/s Vertel This is software and cannot be shown hence to be deleted	Not Agreed. Vocoder type must be specified in specification. However, vocoder type can be filled in Acceptance test format based on the observation in Type test report.	No change.
20.	5.7.9	Spurious emission: Better than 70 dB	Spurious emission: Better than 70 dB	SCR Spurious Suppression	Spurious emission term is being used for VHF radio by all the OEMs, further it is a transmitter parameter hence Spurious emission is OK.	No Change.
21.				M/s Vertel This parameter should be Spurious Suppression instead of Spurious Emission	Spurious emission term is being used for VHF radio by all the OEMs, further it is a transmitter parameter hence Spurious emission is OK.	
22.				M/s Sanchar Communication: Should be 60 dB as per MHA doc.	Not Agreed. Not mentioned in MHA doc.	

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23.	5.7.10, 5.12.1, 5.17.7	Transmitter Output impedance: 50Ω Transmitter Output impedance: 50Ω Output Impedance : 50 Ω	Transmitter Output impedance: 50Ω Transmitter Output impedance: 50Ω Output Impedance : 50 Ω	M/s Iconet Services We request for one more waiver which is- (Transmitter) Output Impedance: 50Ω. Suppliers do not have the facility/ test measuring equipment which can directly read the Transmitter Output Impedance. Only Test Labs have the facility to directly read this parameter. Additionally, all components and circuits in the radio are designed for 50 ohm resistance, so that the antenna and feeder cables which are also at 50 ohm match perfectly with the radio. Another reason for requesting waiver of this requirement (Transmitter Output Impedance 50 ohm) in the Acceptance Test is- The radio analyser which all suppliers possess measures all readings at 50 ohms. In case the Transmitter impedance is not 50 ohms, readings mentioned in the RDSO specifications cannot be demonstrated. Hence, the requirement of demonstrating Transmitter impedance of 50 Ohms may kindly be waived during the Acceptance Test.	No change in specification. However, transmitter output impedance can be filled in Acceptance test format based on the observation in Type test report.	No change.

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24.	5.7.13	Hum & Noise : -34dB @12.5 KHz	Hum & Noise : -34dB @12.5 KHz	M/s Sanchar Communication: Change -40 dB@12.5 K Hz as per MHA Docs. Page 7 Point 2(ii)	Not Agreed.	No change.
25.	5.8.1	Sensitivity : Analog Mode: Better than 0.25 μ V for 12dB SINAD, Digital Mode: 0.18 μ V or better with BER \leq 5%	Sensitivity : Analog Mode: Better than 0.25 μ V for 12dB SINAD, Digital Mode: 0.18 μ V or better with BER \leq 5%	M/s Sanchar Communication: Analog 0.30 μ V for 12dB SINAD or better. Digital 0.30 μ V at 5% BER or better	Not Agreed. Better sensitivity will increase the range, hence specification is OK.	No change.
26.	5.8.6	AF Response : Shall be between +1 dB & -3 dB over the frequency range 300-2700 Hz	AF Response: Shall be between +1 dB & -3 dB over the frequency range 300- 2700 Hz with 1 K Hz as ref.	SCR Since Modulation Fidelity and AF Response are correlated parameters hence for both Frequency limit should be 350-2700 Hz.	Agreed	AF Response: Shall be between +1 dB & -3 dB over the frequency range 300 350 -2700 Hz with 1 K Hz as ref.

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27.				M/s Vertel Since Modulation Fidelity and AF Response are corelated parameters hence for both Frequency limit should be 350-2700 Hz	Agreed	
28.				M/s Sanchar Communication: May be changed to +1 dB & -3 dB over the frequency range 350-2700 Hz with 1 KHz as ref.	Agreed	
29.	5.8.9	Inter-modulation rejection : Better than 60 dB	Inter-modulation rejection : Better than 60 dB	M/s Vertel This is not feasible and parameter can not be shown during the testing and hence should be either deleted OR it should be as per test report basis.	Parameter already proposed not to be measured during acceptance test.	No Change

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30.	5.11.6 VIII	Channel number announcement in English.	Channel number announcement or display in English	CR Channel number announcement or display in English and Hindi.	Option for Hindi included as per user requirement.	Channel number announcement or display in English or Hindi as per user requirement.
31.	5.11.6 XIII	Built in GPS with capability of GIS. Optional: GIS software as per User's Application requirement (GIS software for life time)	Built in GPS with capability of GIS. Optional: GIS software as per User's Application requirement (GIS software for life time)	M/s Vertel This feature can be shown if railway is buying repeater and dispatcher software. In this case it's not applicable, hence to be deleted.	Since GIS software is optional, feature is to be shown only in case Railway is purchasing software. Clause is further clarified.	VHF set shall have built in GPS with capability of GIS. Optional: GIS software as per User's Application requirement (GIS software for life time) However, GIS software (For Lifetime) as per user's application requirement is optional and this feature is to be shown only in case Railway is purchasing software.
32.	5.11.6 XV	Built in Bluetooth for Audio accessory connectivity	Built in Open Standard Bluetooth for Audio accessory connectivity	M/s Vertel It should be Build-in Bluetooth for audio accessory connectivity.	Not Agreed. Open Standard Bluetooth will ensure any Bluetooth accessory can be paired with VHF set.	No change.

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33.	5.12.1	Power output at antenna port : 5 Watt Programmable to 1 Watt	Power output at antenna port: 5 Watt Programmable to 1 Watt if high is selected, it shall be 5 watt and if low is selected it shall be 1 watt. Selection can be switchable or programmable. Tolerance of ±2.5% is acceptable.	M/s Vertel It should be modified and tolerance of 2.5 % in high and low RF wattage should be included	In view of restriction of WPC for transmitted power, + side tolerance is being removed from 5 Watt. Clause being reframed accordingly.	Power output at antenna port: 5 Watt, tolerance of -2% is acceptable. Programmable to 1 Watt If high is selected, it shall be 5 Watt and if low is selected it shall be 1 Watt. Selection can be switchable or programmable. A tolerance of ±2% in case of 5W and ±2% in case of 1W is acceptable.
34.				SCR If high is selected, it shall be 5 watt and if low is selected it shall be 1 watt. Selection can be switchable or programmable. Tolerance of ± 2.5% is acceptable.	During discussion in TCSC it was suggested to remove 1 W option accordingly Clause being reframed. Tolerance of 2% is OK.	
35.				TCSC During discussion in TCSC it was suggested to remove 1 W option.	Agreed. Clause reframed.	

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36.	5.12.2	Frequency stability : ± 0.5 ppm	Frequency stability : ± 0.5 PPM	M/s Sanchar Communication: May be amended to ± 1.5 PPM as per MHA Docs Page no 6 Point no 1(iV)	Not Agreed as per MHA Docs Page no 11 Point no 1.4.	No change.

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37.	5.12.4	Digital protocol: ETSI DMR Open standard (OEM should be Category-1 (Manufacturer Status) member of DMR association). OR Walkie-Talkie sets should be interoperable with walkie-talkie sets of any OEM having IOP certification of DMR association and have supplied their walkie-talkie sets in Indian Railways.	Digital protocol: ETSI DMR Open standard (OEM should be Category-1 (Manufacturer Status) member of DMR association). Set shall have IOP certification issued by DMR association. OR Walkie-Talkie sets should be interoperable with walkie-talkie sets of any OEM. having IOP certification of DMR association and have supplied their walkie-talkie sets in Indian Railways.	M/s Vertel As per RDSO suggestion in the draft specification It should be -- ETSI /DMR open standard (OEM should be Category-1 (Manufacturer Status). Set shall have IOP certification issued by DMR association. OEM set should have been supplied to any government organization in last 1 Year, Otherwise how new models of various OEM will get inducted in Railways.	Digital Sets with Keypad and Display involve signalling feature as well so IOP certification is necessary. Condition of supply to any govt agency is irrelevant.	Digital Protocol: 5.12.4.1 Digital protocol shall be ETSI DMR Open standard and (OEM should be Category-1 (Manufacturer Status) member of DMR association. 5.12.4.2 Set shall have IOP certification issued by DMR association. OR Walkie-Talkie sets should be interoperable with walkie-talkie sets of any OEM. having IOP certification of DMR association and have supplied their walkie-talkie sets being used in Indian Railways.

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38.				<p>M/s Sanchar Communication: Kindly arrange to clarify whether Indian manufacturer needs to obtain IOP certification from TWG or the Manufacturer's walkie talkie should be compatible with radio that Railways are already using, moreover kindly refer document dated 30-01-20 stating no need of IOP certification from TWG released by DCPW.</p>	<p>Digital Sets with Keypad and Display involve signalling feature as well so IOP certification is necessary.</p>	

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39.				<p>SCR ETSI DMR Open standard (OEM should be Category-1(Manufacturer Status) member of DMR association). Set shall have IOP certification issued by DMR association. OR Walkie-Talkie sets should be interoperable with walkie-talkie sets of any OEM. having IOP certification of DMR association and have supplied their walkie-talkie sets to any Government Organisation duly certified by an officer of not less than JAG level.</p>	<p>Digital Sets with Keypad and Display involve signalling feature as well so IOP certification is necessary. Condition of supply to any govt agency is irrelevant.</p>	

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40.	5.12.5	Vocoder type : AMBE+2	Vocoder type : AMBE+2	M/s Vertel This is software and cannot be shown hence to be deleted	Not Agreed. Vocoder type must be specified in specification. However, vocoder type can be filled in Acceptance test format based on the observation in Type test report.	No change.
41.	5.12.9	Spurious emission: Better than 70dB.	Spurious emission: Better than 70 dB	SCR Spurious Suppression	Spurious emission term is being used for VHF radio by all the OEMs, further it is a transmitter parameter hence Spurious emission is OK.	No change
42.				M/s Vertel This parameter should be Spurious Suppression instead of Spurious Emission	Spurious emission term is being used for VHF radio by all the OEMs, further it is a transmitter parameter hence Spurious emission is OK.	No change
43.				M/s Sanchar Communication: Should be 60 dB as per MHA doc.	Not Agreed. Not mentioned in MHA doc.	No change

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44.	5.12.1 4	Hum &Noise : -40dB @12.5 KHz	Hum &Noise : -34dB @12.5 KHz	M/s Sanchar Communication: Change -40 dB@12.5 K Hz as per MHA Docs. Page 7 Point 2(ii)	Not Agreed.	No change
45.	5.13.1	Sensitivity: Analog Mode- Better than 0.25 μ V for 12dB SINAD. Digital Mode- 0.18 μ V or better with BER \leq 5%	Sensitivity: Analog Mode- Better than 0.25 μ V for 12dB SINAD. Digital Mode- 0.18 μ V or better with BER \leq 5%	M/s Sanchar Communication: Analog 0.30 μ V for 12dB SINAD or better. Digital 0.30 μ V at 5% BER or better	Better sensitivity will increase the range, hence specification is OK	No change
46.	5.13.6	AF Response : Within +1, -3 dB of 6 dB / Octave	AF Response: Within +1, -3 dB of 6 dB / Octave Shall be between +1 dB & -3 dB over the frequency range 350 Hz to 2700 Hz with 1KHz as ref.	M/s Sanchar Communication: May be changed to +1 dB & -3 dB over the frequency range 350-2700 Hz with 1 KHz as ref.	Agreed as already proposed in draft of ver. 2.0.	No change.

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47.	5.13.8	New clause added	Inter-modulation rejection : Better than 60 dB	M/s Vertel This is not feasible and parameter can not be shown during the testing and hence should be either deleted OR it should be as per test report basis.	Agreed. Parameter already proposed not to be measured during acceptance test (refer Cl. 9.5.1.3)	No change.
48.	5.16.4	Emission : 11K0F3E (12.5 khz) and 4FSK	Emission:11K0F3E (12.5KHz) and 4 FSK	M/s Vertel This cannot be shown during the testing and should be deleted	Emission type must be specified in the specification. However, this parameter can be filled in Acceptance test format based on the observation in Type test report.	No change.
49.	5.16.5	12.5 kHz Data : 7K60F1D and 7K60FXD,	12.5 KHz Data: 7K60F1D and 7K60FXD	M/s Vertel This cannot be shown during the testing and should be deleted	Emission type must be specified in the specification. However, this parameter can be filled in Acceptance test format based on the observation in Type test report.	No change.

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50.	5.16.6	12.5 kHz Voice : 7K60F1E and 7K60FXE,	12.5 KHz Voice: 7K60F1E and 7K60FXE	M/s Vertel This cannot be shown during the testing and should be deleted	Emission type must be specified in the specification. However, this parameter can be filled in Acceptance test format based on the observation in Type test report.	No change.
51.	5.16.7	Combination of 12.5 kHz Voice and Data: 7K60F1W)	Combination of 12.5 KHz Voice and Data: 7K60F1W	M/s Vertel This cannot be shown during the testing and should be deleted	Emission type must be specified in the specification. However, this parameter can be filled in Acceptance test format based on the observation in Type test report.	No change.
52.	5.16.1 3 XI	Built in GPS with capability of GIS. Optional: GIS software as per User"s Application requirement (GIS software for life time).	Built in GPS with capability of GIS. Optional: GIS software as per User's Application requirement (GIS software for life time).	M/s Vertel This feature can be shown if railway is buying repeater and dispatcher software. In this case it's not applicable, hence to be deleted.	Since GIS software is optional, feature is to be shown only in case Railway is purchasing software. Clause is further clarified.	VHF set shall have built in GPS with capability of GIS. Optional: However GIS software as per User's Application requirement (GIS software for life time) is optional and this feature is to be shown only in case Railway is purchasing software.

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53.	5.16.13 XII	Software for life time	Software for life time	Nil	Already covered in 5.16.13 XI	Clause deleted.
54.	5.16.13 XIV	Built in Bluetooth for Audio accessory connectivity	Built in Bluetooth for Audio accessory connectivity	M/s Vertel This feature pertains to handheld radio and hence should be deleted	Agreed.	Clause deleted.
55.	5.17.1	RF Power Output : 10 to 25 Watt adjustable	RF Power Output : 10 to 25 Watt adjustable, Tolerance of $\pm 2\%$ is acceptable.	Nil	Due to WPC license limitation + side tolerance can not be permitted.	RF Power Output : 10 to 25 Watt adjustable, Tolerance of $\pm 2\%$ -2% is acceptable.
56.	5.17.2	Frequency Deviation : +/- 2.5 kHz (N type)	Frequency Deviation: ± 2.5 kHz for (N Type)	M/s Vertel It should be ± 2.5 kHz for Narrow Band Channel Spacing.	Agreed.	Frequency Deviation: ± 2.5 kHz (N-Type) for Narrow Band Channel Spacing
57.	5.17.6	Spurious and Harmonics: Better than 60db	Spurious emission: Better than 70 dB	M/s Sanchar Communication: Should be 60 dB as per MHA doc.	Not agreed. Not mentioned in MHA doc.	No change.

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58.	5.17.7	Output Impedance : 50 Ω	Output Impedance :50 ohm	M/s Vertel This cannot be shown during the testing and should be deleted	Output impedance must be specified in the specification. However, this parameter can be filled in Acceptance test format based on the observation in Type test report.	No change.

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59.	5.17.8	Digital protocol: ETSI DMR Open standard (OEM should be Category-1(Manufacturer Status) member of DMR association). OR Walkie-Talkie sets should be interoperable with walkie-talkie sets of any OEM having IOP certification of DMR association and have supplied their walkie-talkie sets in Indian Railways.	Digital protocol : ETSI DMR Open standard (OEM should be Category-1(Manufacturer Status) member of DMR association). Set shall have IOP certification issued by DMR association OR Walkie-Talkie Radio sets should be interoperable with walkie-talkie-Radio sets of any OEM having IOP certification of DMR association and have supplied their walkie-talkie sets in Indian Railways.	M/s Vertel As per RDSO suggestion in the draft specification It should be -- ETSI TS/DMR open standard (OEM should be Category-1 (Manufacturer Status). Set shall have IOP certification issued by DMR association. OEM set should have been supplied to any government organization in last 1 Year, Otherwise how new models of various OEM will get inducted in Railways.	Digital Sets with Keypad and Display involve signalling feature as well so IOP certification is necessary. Condition of supply to any govt agency is irrelevant.	Digital Protocol: 5.17.8.1 Digital protocol shall be ETSI DMR Open standard and OEM should be Category-1 (Manufacturer Status) member of DMR association. 5.17.8.2 Radio Set shall have IOP certification issued by DMR association. OR Walkie-Talkie Radio sets should be interoperable with walkie-talkie Radio sets of any OEM having IOP certification of DMR association and have supplied their walkie-talkie sets being used in Indian Railways.

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60.				<p>SCR ETSI DMR Open standard (OEM should be Category-1(Manufacturer Status) member of DMR association). Set shall have IOP certification issued by DMR association OR Radio sets should be interoperable with walkie-talkie/Radio sets of any OEM having IOP certification of DMR association and have supplied their walkie-talkie sets to any Government Organisation duly certified by an officer of not less than JAG level.</p>	<p>Digital Sets with Keypad and Display involve signalling feature as well so IOP certification is necessary. Condition of supply to any govt agency is irrelevant.</p>	

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61.				<p>M/s Sanchar Communication: Kindly arrange to clarify whether Indian manufacturer needs to obtain IOP certification from TWG or the Manufacturer's walkie talkie should be compatible with radio that Railways are already using, moreover kindly refer document dated 30-01-20 stating no need of IOP certification from TWG released by DCPW.</p>	<p>Digital Sets with Keypad and Display involve signalling feature as well so IOP certification is necessary.</p>	

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62.	5.18.1	Sensitivity :Analog Mode: Better than 0.25 μ V for 12dB SINAD, Digital Mode: 0.18 μ V or better with BER \leq 5%	Sensitivity :Analog Mode: Better than 0.25 μ V for 12dB SINAD, Digital Mode: 0.18 μ V or better with BER \leq 5%	M/s Sanchar Communication: Analog 0.30 μ V for 12dB SINAD or better. Digital 0.30 μ V at 5% BER or better	Better sensitivity will increase the range, hence specification is OK	No change
63.	5.18.6	AF Response : Within +1 , -3 dB of 7 dB / Octave Pre-emphasis characteristic from 350 Hz to 2700 Hz with 1KHz as reference.	AF Response : Shall be between Within +1dB & , -3 dB of 7 dB / Octave Pre-emphasis characteristic over the frequency range from 350300 Hz to 2700 Hz with 1KHz as reference.	M/s Vertel Since Modulation Fidelity and AF Response are corelated parameters hence for both Frequency limit should be 350-2700 Hz	Agreed	AF Response : Shall be between Within +1dB & -3 dB of 7 dB / Octave Pre-emphasis characteristic over the frequency range from 350 300 350 Hz to 2700 Hz with 1KHz as reference.

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64.				SCR Since Modulation Fidelity and AF Response are correlated parameters hence for both Frequency limit should be 350-2700 Hz.	Agreed	
65.				M/s Sanchar Communication: May be changed to +1 dB & -3 dB over the frequency range 350-2700 Hz with 1 KHz as ref.	Agreed	

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66.	8	ENVIRONMENTAL AND CLIMATIC REQUIREMENT:	Environmental and climatic requirement (Reference column was proposed to be removed. Instead, Cl. 8.3 was included).	M/s Sanchar Communication: Old report will do or all the test require new testing. Name of laboratory for above tests to be mentioned. Private NABL approved Lab names to be mentioned	As per specification type test is to be conducted on two samples. If complete test report as per Type test format is available same may be accepted. If it is not available or if there is any change in Hardware and/or software and/or model no. of the set, fresh type test is to be carried out.	No change.
67.				SER Test should be conducted in labs (NABL/ILAC accredited or Government Approved laboratories) as per criteria defined by RDSO.	A criterion of selection of lab for type test is well defined in RDSO apex level document no. QO-D- 8.1-10	No change.
68.	8.1 SN 8	2*(10gm/m3 air velocity 8.9 m/s*6 Hrs, air velocity 1.5 m/s*1 Hr)	Sand Dust blowing: 2*(10gm/m3 air velocity 8.9 m/s*6 Hrs, air velocity 1.5 m/s*1 Hr)	SCR Sand Dust blowing: At air velocity of 1.5 m/s*1 Hr.	In view of SCR remark that no test facility available for testing at 8.9m/s, Agreed.	Sand Dust blowing: 2*(10gm/m3, air velocity 8.9 m/s*6 Hrs, air velocity 1.5 m/s*1 Hr)

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69.				<p>M/s Iconet Services Sand and Dust Blowing: "Air Velocity 8.9m/sec* 6hrs". No Govt. Test Lab in India including ETDC Mohali, has this facility. It is requested- this requirement may kindly be removed. However, the requirement of air velocity 1.5m/sec *1 hr need not be removed. This facility is available with Test Labs. The reason propounded by the Test Labs when we approached them was- In Indian Environment, sand or dust velocity never exceeds 1.5m/sec, hence they don't have this facility.</p>	Agreed.	

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70.	8.1 SN 11	IP- IEC 60529-IP65/ IP66/ IP67 for 5W radio & IP 54 for 25 W radio	IP- IEC 60529-IP65/ IP66/ IP67 for 5W radio & IP 54 for 25 W radio	TCSC It is difficult to finalize the tender if many configurations are there as per specification, for walkie talkie only IP67 should be there.	Agreed.	IP- IEC 60529- IP65/ IP66/ IP67 for 5W radio & IP 54 for 25 W radio
71.	8.2	Above test should be conducted in labs as per criteria defined by RDSO.	Above test should be conducted in labs as per criteria defined by RDSO.	M/s Vertel Above test should be conducted in the LAB as per the criteria defined by RDSO	Firm comment not clear.	No Change.
72.				NWR Certification agency (Lab) for test should be specified	A criterion of selection of lab for type test is well defined in RDSO apex level document no. QO-D- 8.1-10.	

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73.	8.3	New Clause	MIL STD 810 G or latest may be referred for tests from SN 1-10 and IEC 60529 for test at SN 11	M/s Vertel MIL STD 810 G OR IS-9000 OR IEC standard as applicable for various test. Testing of equipment to be done as per the Severity mentioned in the specifications	Test severity in the IS 9000 or latest is not at par with MIL 810 G. Further if reference is removed it will be difficult to lab to conduct the test because test parameter and test procedure both are necessary to carry out any test.	'Reference' column of Cl. 8.1 was proposed to be deleted in draft of ver. 2.0. Same is being restored because it is not possible to define reference and applicable procedure in single line, hence new clause Cl. 8.3 added in draft is being deleted. MIL-STD-810-G or latest may be referred for tests from SN 1-10 and IEC 60529 for test at SN 11
74.	9.5.1.1	Visual Inspection (Clause 3.0 to 4.0 & IRS:S:23 as applicable)	Visual Inspection (Clause 3.0 to 4.0 & Cl 8.2 of IRS:S:23 as applicable)	M/s Vertel Visual Inspection: IRS/S23. This is applicable for signalling equipment and not for Telecom equipment like Walky Talky and hence to be deleted.	After adding particular Cl. of IRS: S: 23, now it is clear what to be verified.	No change.

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75.	9.7 (new clause)	NIL	NIL	As per discussion with Railway Board	To check the actual field performance new clause related to proof of concept trial is being added.	POC Trial: To check the actual field performance of the VHF set, POC trial shall be conducted by the concerned Zonal Railway indenting the VHF sets as per guidelines issued by RDSO.
76.	10.6	GIS software to be specified by the purchaser in case of 25 W radio set.	GIS software to be specified by the purchaser in case of 25 W radio set.	Nil	In view of revision in cl. No. 5.11.6 xiii and 5.16.13 xi, the requirement is to be specified by the purchaser. Therefore, clause is reframed	Requirement of GIS software to be specified by the purchaser in case of 5 W DMR Walki-Talkie set with keypad and display and 25 W radio set.
77.	10.7	Required IP as per Cl. 8.1, SN 11 for 5W walkie-talkie set. If not defined by purchaser, default shall be IP 67.	Required IP as per Cl. 8.1, SN 11 for 5W walkie-talkie set. If not defined by purchaser, default shall be IP 67.	Nil	In view of change in Cl 8.1 SN 11 this is not required.	Required IP as per Cl. 8.1, SN 11 for 5W walkie-talkie set. If not defined by purchaser, default shall be IP 67.
78.	10.7	New clause		Nil	In view of change in cl. 5.11.6 VIII	Language required (English or Hindi) for channel no announcement/display (5.11.6 VIII)

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79.	13	ISO Binding Clause: All the provisions contained in RDSO's ISO procedures laid down in Document No. QO-D-7.1-11 dated 19.07.2016 (titled "Vendor-Changes in approved status") and subsequent versions/amendments thereof, shall be binding and applicable on the successful vendor/ vendors in the contracts floated by Railways to maintain quality of products supplied to Railways.	Clause Deleted.	M/s Vertel ISO binding clause: Document no QO-D 7.1-11 Dated 19/07/2016. This is not applicable for these specification and hence to be deleted.	Proposed deletion. for	Deleted.

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80.	—		Nil	<p>M/s Vertel DOPT order dated 20.12.2022 regarding Technical specifications of the product should be considered for VHF Transceiver equipment in RDSO revised specifications</p> <p>MII order dated 20.12.2022 (Copy attached) which clearly stipulates (Annexure A point no. 1 c) that equivalent Indian certification and (Annexure A point no 4 A) temperature etc. should be as per the Indian condition so that MII products need to meet Indian Standard. We were highlighting the same only regarding Environmental condition (MIL standard). If MIL standard specify some climatic conditions, RDSO should specify IS standard and severity for the same. This will give level playing field to Indian OEM. Just eliminating MIL STD 810 will not serve any purpose because IS standard and MIL standard are 2 different standards and have different severity.</p> <p>This will give advantage to Make in India Products and foreign OEM's will be forced to start manufacturing the product in India which is the vision of our Country</p>	<p>Not Agreed. The VHF sets are used in Indian Railways for safe operation of trains.</p> <p>ENVIRONMENTAL AND CLIMATIC TESTS REQUIREMENT are related to ensure ruggedness and quality of the product.</p> <p>Further, labs are available in India for testing as per MIL standards.</p> <p>Equivalent IS standards are not available with severity as per MIL standards.</p>	No Change.

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81.	—		Nil	<p>M/s Vertel EMI/ EMC test</p> <p>We request you to kindly forward this to RDSO for considering these orders while finalizing Digital Radio spec.</p> <p>As equipment is required to be used in Running train and hence equipment should meet these standards</p> <p>OEM should get their equipment tested from NABL accredited lab.</p>	Testing of equipment shall be done as per RDSO criteria.	No Change.

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82.	—		Nil	M/s Vertel MIL STD 810 to be deleted from the revised specifications	Not Agreed. If reference is removed it will be difficult to lab to conduct the test because test parameter and test procedure both are necessary to carry out any test.	No change.
83.	—		Nil	M/s Vertel All above amendment should be applicable in RDSO specification dated 06/07/2022 as well as in ATF and TTF also.	Once specification is finalized ATF And TTF will be revised accordingly.	No change.
84.					Typographical errors or mere change in sentences for clarifying the meaning etc. are reflected in RED in various clauses.	