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भारत सरकार
(Government of India)
रेल मंत्रालय
(Ministry of Railways)

Schedule of Requirement (SOR)

for

supply of IGBT based complete propulsion system

SOR No: PLW/EL/Propulsion system/SOR/002, Rev. 02

September 2025

PATIALA LOCOMOTIVES WORKS
(Formerly DIESEL LOCO MODERNISATION WORKS)

PATIALA-147003

SSE/Design	AEE/Design	Dy.CME/Design
		 Pradev 01/09/25

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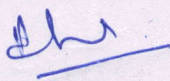
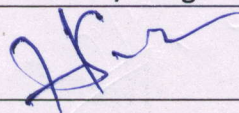
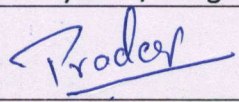
1. Scope:

The scope of this specification covers the Manufacturing , Supply and Commissioning of IGBT Based Complete Propulsion System in 3-phase locomotives.

2. Scope of Supply:

The propulsion system is procured as per description:

"IGBT BASED 3-PHASE DRIVE PROPULSION EQUIPMENTS COMPRISING OF TRACTION CONVERTERS, AUXILIARY CONVERTERS, VEHICLE CONTROL UNITS (VCU) FOR COMPLETE THREE PHASE LOCOMOTIVE ALONG WITH PHYSICAL MEDIUM I.E. ESD/EMD/OFG FOR MULTI FUNCTIONAL VEHICLE BUS (MVB) TO INTER-CONNECT ALL THE BUS STATIONS AS PER IEC-61375, TERMINAL BRACKETS, BUS BAR LINKS AND COPPER BRAIDS REQUIRED FOR CONNECTION BETWEEN MAIN TRANSFORMER AND TRACTION CONVERTERS, AUXILIARY CONVERTERS, INTERFACING CONNECTORS, CABLES AND CABLE LOOMS WITH CONNECTORS REQUIRED FOR CONNECTION FROM VCU1/2 TO SB1/2 PANEL, TRACTION MOTOR SPEED SENSORS, COMPLETE ASSEMBLED AND WIRED PANEL C FITTED WITH DRIVER DISPLAY UNIT(S) AND INTERFACE FOR BOTH CAB, AS PER FOLLOWING SPECIFICATIONS: (I) RDSO/2008/EL/SPEC/0071,REV.5 FOR IGBT BASED 3-PHASE DRIVE PROPULSION EQUIPMENT (II) CLW/ES/3/0528 ALT-A OR LATEST FOR TM SPEED SENSOR FOR IGBT TRACTION CONVERTER (III) CLW/ES/3/0138 ALT-A OR LATEST FOR COPPER BRAID (IV) CLW/ES/3/0458 ALT.E OR LATEST FOR CONTROL CABLES (V) CLW/ES/3/0459 ALT.C OR LATEST FOR SCREENED CABLES (VI) CLW/ES/3/0124 ALT.'O' OR LATEST FOR SET OF CONNECTORS. (VII) CLW/ES/3/0240 ALT-B OR LATEST FOR PANEL C (WITHOUT DIAGNOSTIC TERMINAL). (VIII) RDSO MODIFICATION SHEET NO. RDSO/2012/MS/0413 REV 1 OR LATEST (IX) RDSO MODIFICATION SHEET NO. RDSO/2020/EL/MS/0482, Rev'1' OR LATEST (X) RDSO MODIFICATION SHEET NO. RDSO/2017/EL/MS/0457 REV-0 OR LATEST (XI) ALL THE RELEVANT RDSO MODIFICATION SHEETS APPLICABLE FOR THE SUB-COMPONENTS OF IGBT BASE 3-PHASE DRIVE PROPULSION EQUIPMENT SHOULD BE IMPLEMENTED. (XII) CLW SPEC NO. CLW/ES/3/0431 (XIII) SPECIAL CONDITION OF CONTRACT AGAINST RDSO SPEC.RDSO/2008/EL/SPEC/0071 REV.05 (XIV) CLW SPEC NO. CLW/AMC/CD/01 (MARCH 2016). (XV) CLW STR FOR MANUFACTURING OF DRIVER DISPLAY (XVI) CLW STR FOR MANUFACTURE AND SUPPLY OF AUX. CONVERTER, STR NO.CLW/C-D&D/STR/002 Rev-0 OR LATEST"

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NOTE: IN TERMS OF PARA 1.5 & 1.6 OF RDSO SPECIFICATION NO. RDSO/2008/EL/SPEC/0071, REV.5 FOR IGBT BASED 3-PHASE DRIVE PROPULSION EQUIPMENT, SUPPLY, LAYING, INSTALLATION AND CONNECTION/INTEGRATION OF CONTROL CABLES FROM PROPULSION EQUIPMENTS TO SB1/2 PANEL INCLUDING CONNECTION/INTEGRATION IN SB1/2 PANEL SHALL BE IN FIRM'S SCOPE.

In addition to above description, the propulsion system should also comply following requirements:

1. GUI (Graphical User Interface) of Home Screen of DDU (Driver Display Unit) incorporating healthiness/isolation of each motor, rectifier and inverter module.
2. Continuous Recording of critical 43 (forty-three) parameters with sampling rate of 01 (one) seconds for minimum 24 hrs as per signal list attached as Annexure-A. Data recording File shall have feature for recording of 50 signals, out of which 43 signals are already mentioned in Annexure-A. The 44th signal shall be utilized for recording of actual Brake-Pipe (BP) pressure monitoring. The remaining six spare signals shall be as under: a) three no. analog signal, b) Three no. digital signal for future purpose.
3. Energy Saving scheme in line with RDSO Modification Sheet no. 0482, Rev.1. attached as Annexure-B.
4. MVB ports ready for integration with DPWCS (Distributed Power Wireless Control System) and Software of WTB (Wire Train Bus) interoperability in line with ICD attached as Annexure-C.
5. Protection scheme in line with ToT Doc no. 3EHP541526 and control algorithm in line with ToT Doc no. 3EHP541681, 3EHWS10068. Design Parameters in line with ToT Doc no. 3EHN420456, 3EHVW500453, 3EHP510054, 3EHP551009, 3EHPS51010. ToT Documents attached as Annexure-D for reference.
6. Provision of Remote Monitoring System (RMS) either in standalone form or inbuilt with propulsion system. The propulsion system shall be provided with remote diagnostic and tracking equipment. The equipment shall be based on GPS/GSM-R or latest

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