

**Reasoned document for STR No. TI/ STR/ 004 Rev 1 for Series Reactors for Shunt capacitor bank for 25kV  
ac Single Phase Traction System**

CI	Content	Comments	RDSO's remarks
		QP: The Word "Vendor" should be replaced with "Manufacturer" in the draft.	'Vendor' has been replaced with 'Firm'
		QP: The Vendor should be "Original Equipment Manufacturer" of Low Loss Series Reactors	Not accepted as 'Vendor' has been replaced with 'Firm'
3.0	Plant & machinery	QP: Toroidal Duty Winding Machines, Insulation Cutting & Preparation Machines & Power Press Machine are NOT required in manufacturing of Series Reactors	Accepted and deleted.
3.6	Toroidal duty winding machines	TDK: Toroidal winding machine not required for high power MV reactor  Srihans: No specific need for toroidal duty winding machines Heavy/medium light duty winding machines are adequate	Accepted and deleted.
3.9	lathe	Srihans: As it is outsourced not necessary to have it.	Accepted and deleted.
3.11	Electric arc welding machine	If Tig welding is available, no need of arc welding machine	Accepted and deleted. Cl.3.11 Electric arc welding machine deleted
	*The activity at <b>para 3.9</b> above i.e. Power press, <b>lathe</b> , drilling machines, cutting machines etc may be outsourced subject to stringent quality control by Vendor. The Vendor has to	Srihans: The activity at item 3.9 & 3.10 above i.e., Power press, drilling machines, cutting machines, tig welding equipment etc may be outsourced subject to stringent quality control by Vendor. The Vendor has to provide detail information regarding this in the Quality Assurance Plan (to be approved by	Accepted and deleted. Content modified as under Note: The items at para 3.7 & 3.8 above i.e., drilling machines, cutting machines etc. and Tig welding equipment respectively may be outsourced subject to stringent quality control by Firm. The Firm has to provide detail information

	provide detail information regarding this in the Quality Assurance Plan (to be approved by RDSO) and also ensure that the Power press, <b>lathe</b> , drilling machines, cutting machines etc	RDSO) and also ensure that the Power press, drilling machines, cutting machines etc	regarding this in the Quality Assurance Plan (to be approved by RDSO) and also ensure drilling machines, cutting machines, Tig welding equipment etc. shall be essentially available at the premises of the firm from where this facility is outsourced.
5.0	Inspection & Testing facility	QP: In place of Analog LCR Meter & CRO it is strongly recommended to use Digital meters for higher accuracy and reliability in measuring systems. Analog meters are Obsolete	Accepted and Analog meters deleted
5.4	Bridge for resistance measurement (Kelvin/Double frequency)	Srihans: Digital Resistance measurement	Accepted and incorporated
5.14	Analog LCR meter	TDK: 5.13 & 5.14 can be clubbed. Digital or Analog LCR meter Srihans: 5.13 Digital/Analog LCR meter	Digital LCR meter only
5.18	CRO	Srihans May be removed	Accepted and removed
Page1	Doc title Schedule of infrastructure technical requirements for manufacturing & testing facilities and Quality Control requirements Approval of Firms for Supply of Air Cooled Series Reactors for Shunt Capacitor Banks for Traction Sub- Stations of Indian Railways	ABB: The document title shall be “Schedule of Technical Requirement for Manufacturing & testing facilities and quality control requirement for Shunt and Series Capacitor Bank for Traction Sub – Station of Indian Railways”	Accepted and incorporated as under: Schedule of Technical Requirement for Manufacturing & testing facilities and quality control requirement for approval of firms for supply of Series Reactors for Capacitor Bank for Traction Sub – Station of Indian Railways”

2		<p>ABB: We do not advice or endorse approving of ‘contract manufacturing’ of capacitors. The life of HV/MV Capacitors is primarily dependent on raw materials, design and manufacturing process. The manufacturer needs to have very close monitoring of these three aspects based on which only product can deliver the required performance as per defined quality standards. If design responsibility is taken by one party and manufacturing is on other party, this accountability gets diluted. Further, to maintain the standards of manufacturing process, putting accountability of warranty to a party who is not a manufacturer is not preferred. Reason being that in case of any failure in the capacitor at any site, it will be very difficult to identify or pin-point on the manufacturer and arrive at root cause analysis for the failure. Further, capacitors are always a sub-component of a complete solution and hence solution provider should be accountable for th e key component which is capacitor in this case for satisfactory operation of the system. In view, we request to not allow non-manufacturers to participate in RDSO /Railways as this will open the field to all types of contractors and there will be no control on the product.</p>	Contract manufacturing not endorsed in this STR
3		<p>ABB: We propose that shot blasting and painting activities shall be sub-contracted, under the quality control of the manufacturers, as these are only mechanical activities which does not relates to the performance of the offered equipment.</p>	NA
3		ABB:	Accepted and incorporated accordingly

		Welding machine shall be Tig welding/ Mig welding machine based on the manufacturer's technology and process	
5		ABB: The capacitor winding room should be certified for Class 10000 or Higher class to ensure dust control.	NA
5		ABB: Considering the criticality of the application, we propose that the manufacturer should have set up for Vacuum Impregnation which is completely automated through SCADA.	Accepted and incorporated as under '3.2 Vacuum chamber with set up for vacuum impregnation'
6		ABB: Due to the advancement in recent technologies, the firm may or may not possess the following instrument as part of testing and inspection facilities. LCR meter/ Bridge Oscilloscope null detector Rheostats of different rating However routine test as per relevant standards/ specification shall be carried out with available instrument at the manufacturer works which shall cover the functional requirement of above instruments.	Availability of measuring instrument mentioned in the STR, to be ensured by the firm.