

**SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURE & SUPPLY  
OF HARDWARE ITEMS FOR 3-PHASE TM, HTM, SL-30 & SJ OF ELECTRIC  
LOCOMOTIVES.**

**ISSUED BY**

TRACTION MOTOR DESIGN OFFICE  
**CHITTARANJAN LOCOMOTIVE WORKS**  
CHITTARANJAN – 713365  
WEST BENGAL

RECOMMENDED BY-	APPROVED BY-
<b>RAJIV KUMAR BARNWAL</b> Digitally signed by RAJIV KUMAR BARNWAL Date: 2023.04.18 18:25:14 +05'30' CEE/TM	<b>R YADAV</b> Digitally signed by R YADAV Date: 2023.04.19 10:24:27 +05'30' PCEE

Remark: Revision '2' done for Digitization.

Prepared & Checked by	<b>RANJAN KUMAR</b> Digitally signed by RANJAN KUMAR Date: 2023.04.13 13:08:57 +05'30'	Reviewed by	<b>RANJAN KUMAR PRAMANIK</b> Digitally signed by RANJAN KUMAR PRAMANIK Date: 2023.04.18 13:14:36 +05'30'
SSE/TMDO		Dy.CEE/TMD	

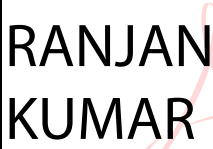
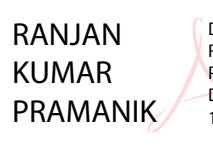
**ALTERATION SHEET FOR MANUFACTURE & SUPPLY OF HARDWARE ITEMS  
FOR 3-PHASE TM, HTM, SL-30 & SJ OF ELECTRIC LOCOMOTIVES.**

Sl No.	Alt. No.	Authority	Description	Initial	Date

Prepared & Checked by	<b>RANJAN KUMAR</b> Digitally signed by RANJAN KUMAR Date: 2023.04.13 13:12:00 +05'30'	Reviewed by	<b>RANJAN KUMAR PRAMANIK</b> Digitally signed by RANJAN KUMAR PRAMANIK Date: 2023.04.18 13:16:56 +05'30'
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## SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURE & SUPPLY OF HARDWARE ITEMS FOR 3-PHASE TM, HTM, SL-30 & SJ OF ELECTRIC LOCOMOTIVES.

1. **Scope:** - This schedule of technical requirement (STR) is being issued to serve as guidelines to manufacturers/firms for manufacturing of Hardware items, format of Quality Assurance Plan to be followed, Minimum Machinery and Plant, Testing facilities & Measurement facilities required. This STR should be read in conjunction with the relevant specification. The firm should satisfy themselves having complied with the requirements of the specification and STR.
2. **Reference:-** As per IS Specification.
3. **Requirement:** - The firm should be certified to ISO 9001 by an agency accredited by NABCB.
4. **Production Capacity:** Annual production capacity calculation for the full production range must be given on the basis of time required for each process.
5. **Desired aspect in QAP:** - The QAP shall be submitted as per RDSO's QAP format no –QM-RF-8.1-3 version 1.0 or latest instruction issued by competent authority by CLW. QAP has to be approved by CLW.
6. **M&P, Testing and Measuring instrument :-** List of typical M&P required for manufacture, testing and measuring instruments furnished in Annexure – I is for general guidance only and actual manufacturing operations, specific testing & measuring instruments shall be submitted and get approved by the firm as a part of QAP.
7. **Internal Quality Control System:-**
  - 7.1 Quality Assurance Process of incoming materials, manufacturing process used for the subject items including type test, supply criteria covering specn., acceptance norms, agency if tested from outside lab, format of records etc.
  - 7.2 Detailed process flow chart indicating process of manufacture and individual product.
  - 7.3 The testing and measuring equipments and validity of calibration should be current and calibration certificate issued by the calibration agency should be maintained.
  - 7.4 Relevant Standards like IS/BS/IEC/ASTM etc. shall be available with the firm.

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## Annexure-I

**REQUIREMENTS FOR MANUFACTURING/DEVELOPMENT OF HARDWARE ITEMS  
FOR HEX.HD BOLT/SCREW M-6 TO M36 & HEX.NUT/THIN NUT M-12 TO M-16.**

**A. Machinery and Plant:-**

1. Bolt maker Programmable Logic Controlled Machine (M-6 to M-36), accuracy -1 micron.
2. Nut former Programmable Logic Controlled Machine (M-12 to M-16), accuracy -1 micron.
3. Phosphating & Zinc plating facility.
4. Heat treatment Facility.

**B. Testing & Measuring facilities:-**

1. Vernier caliper. (Range 0-200 mm, L.C.-0.02 mm)
2. Micro Meter (Range 0-100 mm, L.C.-0.01 mm)
3. Ring Gauge & Plug Gauge (GO & NO-GO).(Range: M6 to M36)
4. Impact Testing Machine. (Range: 300 J Charpy)
5. Tensile testing Machine. (Range: 1000 KN)
6. Hardness Testing Machine. (Range: 150 Kgf)
7. Chemical Analysis Lab

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