

734314/2022/HEP-TXM20500

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**BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL**  
**QUALITY CONTROL TRANSPORTATION**  
**QUALITY ASSURANCE PLAN (QAP)**

Ref.: TM12545 Rev. 06 Dt.02.01.21

QA Plan for fully finished components (with finish dimensions final machined on CNC machines) with mandatory requirement of checking on 3D CMM, supplied on fully finish basis or labour basis

Note: Components to be finished machined on CNC are Stator frame, Bearing assy. components (including end shields), Suspension tube & its assy. components

**Part 1: Final inspection of the component before dispatch from vendor works (#)**

| Sl. No. | Name of the Process                           | Parameters of Inspection   | Quantum of Check* |               | Mode of Inspection/ Equipment used | Drawing No./Spec./Std.       | Acceptance Norms***          | Requirement from supplier  |
|---------|---|--|-------------------|---------------|------------------------------------|------------------------------|------------------------------|--|
|         |   |  | TP (Supplier)     | QC**          |                                    |                              |                              |  |
| 1.      | Raw material                                  | Applicable only in case order is executed on fully finish basis  |                   |               |                                    |                              |                              |  |
|         | a. If the raw material is casting.            | Applicable QAP No.: QTM/QAP/VENDOR/13-14/001 (latest revision) [Witness & Verification of RT reports & films for correlation with components, only record verification of material testing/checking parameters and verification of 3 test samples (keel blocks separately cast/integrally cast as per specification to be supplied along with consignment.) as per raw material QAP to be done by TPI. No inspection/record verification for cast/rough machined dimensions as per casting QAP.] |                   |               |                                    |                              |                              |  |
|         | b. If the raw material is fabrication/ plate. | Applicable QAP No: QTM/QAP/FABRICATED ITEMS/VENDOR/18-19/01 (latest revision) [Only record verification of testing/checking parameters and verification of TC of plate used for fabrication of component (to be supplied along with consignment) as per raw material QAP to be done by TPI. No inspection/record verification for fabricated/rough machined dimensions as per fabrication QAP.]  |                   |               |                                    |                              |                              |  |
|         | c. If the raw material is forging.            | Applicable QAP No.: QTM/QAP/VENDOR/13-14/002 (latest revision) [Only record verification of testing/checking parameters and verification of 3 test samples to be supplied along with consignment) as per raw material QAP to be done by TPI. No inspection/record verification for forge/rough machined dimensions as per forging QAP.]  |                   |               |                                    |                              |                              |  |
| 2.      | Dimensions                                    | A) Critical to quality (CTQ) dimensions as marked in drawing.  | A) 100%           | A) 20% (Min.) | 3D CMM                             | As per relevant BHEL Drawing | As per relevant BHEL Drawing | Dimensional report along with 3D CMM report to be provided to BHEL |
|         |   | B) Other dimensions (machined/ un-machined).   | B) 100%           | B) 20% (Min.) | 3D CMM / Gauges & Instruments      |                              |                              |  |

लवकुश मौर्य / L. K. MAURYA  
 अभियंता / Engineer

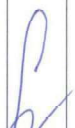
क्यू.टी.एम. प्रभाग / Q.T.M. Division  
 बी.एच.ई.एल., भोपाल / BHEL, BHOPAL

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| Sl. No. | Name of the Process    | Parameters of Inspection  | Quantum of Check* |      | Mode of Inspection/ Equipment used | Drawing No./Spec./Std.                              | Acceptance Norms***  | Requirement from supplier |
|---------|------------------------|---|-------------------|------|------------------------------------|---|--|---------------------------|
|         |                        |   | TP (Supplier)     | QC** |                                    |   |  |                           |
| 3.      | Visual Inspection      | Free from visual defect.  | 100%              | 100% | Visual                             | -   | Component to be free from any abnormality such as blow hole, pin hole, dent etc. | -                         |
| 4.      | Identification marking | Identification marking at machining stage on the location shown in drawing or location may be taken from BHEL Engg. Dept. | 100%              | 10%  | Verification                       | As per relevant BHEL drawing/ specification TM12548 | Identification marking as per BHEL drawing/spec. TM12548                         | -                         |

  
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 अभियंता / Engineer  
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|---------|---|---|-------------------|--|------------------------------------|--|--|---|
|         |   |   | TP (Supplier)     | QC**   |                                    |  |  |   |
| 6.      | Paint (Visual, Dry paint thickness and Adhesion test) | Epoxy primer paint (specification AA56113) on um-machined surfaces. | 100%              | 100%(Visual) & 10% per lot (DFT and adhesion test) | Visual and Instruments             | As per relevant BHEL Drawing/ specification TM94217 (Latest Rev) | As per relevant BHEL Drawing/ specification TM94217 (Latest Rev) | Report to be submitted for-<br>• Visual<br>• DFT<br>• Adhesion  |
| 7.      | Packing   | Packaging suitability for transit & storage                         | 100%              | -  | Visual                             | -  | -  | Each component shall be suitably packed & wrapped to avoid any damage to components during transit and ingress of water. Note: In case any damage to machined surface found during inspection at BHEL, job will be liable to be rejected. |

**Notes:**

- 1) All test records checked by TP, QC (dully signed & sealed) as per above QAP requirement shall be submitted along with consignment.
- 2) Final acceptance will be based on inspection at BHEL, Bhopal.
- 3) (\*) Quantum of inspection shall be in line with QAP unless otherwise mentioned in the drawing.
- 4) (\*\*) Job shall be randomly selected from offered lot, the quantum of check (min. 1 no.) from the offered lot to be checked by QC. (e.g.: If lot size is 2 then minimum one no is to be checked).

लवकुश मौर्य / L.K. MAURYA  
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- 5) (\*\*\*) Sample inspection of component does not mean that the supplier will not meet drawing & specification requirements in remaining components. In case any defect / non-conformance is observed at any stage (during processing or before and after fitment in any job), the same is liable to be rejected and same shall be replaced immediately by the supplier at BHEL or BHEL Customer site (wherever deficiency is observed) and necessary penal action will be taken as per BHEL norms.

**Part II: Requirement of clearance of 1<sup>st</sup> lot from BHEL:**

- 1) First lot of item shall be supplied after meeting all QAP requirements to BHEL Bhopal and supply of subsequent lots shall be undertaken only after clearance of first lot by BHEL Bhopal.
- 2) Vendor has to initiate the supplies as per PO delivery only. Delay in supply of first lot of components or rejection of components due to any non-conformity/ quality deficiency shall not be considered as reason for delay in supply of components in subsequent deliveries as per PO delivery requirement.
- 3) Initial clearance of 1st lot of items does not absolve the supplier from supply of items as per drawing and specification requirement in subsequent lots.

**Meaning of Legends: '#' - Supplier to submit test certificates & reports of above mentioned parameters.**

**Abbreviation:** T P – Task Performer (Supplier), QC – Quality Control (QIX / BHEL appointed inspection agency)

| Prepared by:   | Approved by:  |   |   | Issued by:   |
|--|---|---|---|--|
| <br><b>लवकुश मौर्या / L. K. MAURYA</b><br>अभियंता / Engineer<br>क्यू.टी.एम. प्रभाग / Q.T.M. Division<br>बी.एच.ई.एल., भोपाल / BHEL, BHOPAL | <br><b>MANISH VERMA</b><br>TME<br>उप महाप्रबंधक (अभिकल्प) / DCM (Design)<br>टी.एम.ई. विभाग / TME Division<br>बी.एच.ई.एल., भोपाल / BHEL, Bhopal | <br><b>RAJESH KUMAR</b><br>वरिष्ठ प्रबंधक / Sr. Manager<br>टी.एक्स.एम. विभाग / TXM Division<br>बी.एच.ई.एल., भोपाल / BHEL, Bhopal | <br><b>M.L. K...</b><br>QTM<br>एम.एल. कत्याल / M.L. K...<br>उप महाप्रबंधक / Dy. General Manager<br>क्यू.टी.एम. प्रभाग / Q.T.M. Division<br>बी.एच.ई.एल., भोपाल / BHEL, BHOPAL | <br><b>RAVI D...</b><br>QTM<br>राहुल दोषी / RAHUL D...<br>प्रबंधक / Manager<br>क्यू.टी.एम. विभाग / Q.T.M. Division<br>बी.एच.ई.एल., भोपाल / BHEL, BHOPAL |



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L. K. MAURYA  
Engineer

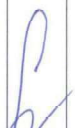
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