

| Supplier's LOGO | Supplier's Name and Address | | Quality Plan for 16Mo3 Pipes | | | | | QP No:16Mo3Pipe-01 Rev 01 Project: GHAVP 1& 2 W.O : D157 to D160-001-1-93-171 | | | | |
|-----------------|---|------------------------------------|--|------------------|---|------------------|------------------|---|--------|----|--|-----------------------------|
| | | | Item : 16Mo3 Pipes Material: DIN EN 10216-2/1.5415 Sub-system: Steam Generator | | QP No.: To be filled by Supplier Rev.No.: To be filled by Supplier Date: To be filled by Supplier Page No:1 of 3 | | | | | | | |
| Sl. No | Component & Operations | Characteristics | Type of Check | Quantum of check | Reference Document | Acceptance Norms | Format of Record | | Agency | | | Remarks |
| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | D* | 9. ** | | | 10. |
| 1.0 | Raw Material : | | | | | | | | | | | |
| 1.1 | Steel Melting : :Method to be filled by Supplier | Steel melting | Record Verification | 100% | DIN EN 10216-2/1.5415 MPP: To be submitted | TC | √ | P | --- | -- | | Steel shall be fully killed |
| 1.2 | Ladle Analysis | Chemistry | Chemical analysis | 1/Melt | DIN EN 10216-2/1.5415 MPP: To be submitted | TC | √ | P | R | R | | ---- |
| 1.3 | Ingot/Billet Casting | Free from defects | Visual/Record verification | 100% | MPP: To be submitted | RD | -- | P | -- | -- | | ---- |
| 2.0 | In process Controls : | | | | | | | | | | | |
| 2.1 | Operations from Ingot/Billet to Pipe : To be elaborated by Supplier | Process parameters | Record Verification | 100% | DIN EN 10216-2/1.5415 MPP: To be submitted Drg :To be filled(applicable) | RD | --- | P | --- | -- | | -- |
| 2.2 | Visual & Identification of Pipes | Visual & Identification | Verification and Visual | 100% | DIN EN 10216-2/1.5415 | --- | -- | P | W | R | | -- |
| 2.3 | Heat Treatment (Normalization) | R.O.H , Soaking Temp & Time, R.O.C | Review of HT Chart | 100% | DIN EN 10216-2/1.5415 HT Plan: To be submitted | TC | √ | P | R | R | | Note-3 |

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| Prepared | Reviewed & Approved | Reviewed & Approved | Reviewed & Approved | |
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[INITIALS-D.R/PA]

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| 2.4 | Identification of Test coupon | Identification (location , orientation stamping) | Visual , marking and dimension | 100% | TDC-D157-001 EN IS 377 MSTP: To be submitted | RD | √ | P | H | H | --- | |
| 2.5 | Ultrasonic Inspection | Internal soundness | Ultrasonic Test | 100% | DIN EN 10216-2/1.5415 UT Procedure: To be submitted TDC-D157-001 | TC | √ | P | H | H | --- | |
| 2.6 | Leak Tightness Check | Hydro | Hydro | 100% | DIN EN 10216-2/1.5415 TDC-D157-001 Procedure: To be submitted. | TC | √ | P | H | H | --- | |
| 2.7 | Mechanical and Metallurgical Tests : | | | | | | | | | | | |
| 2.8 | Product analysis | Chemistry | Chemical analysis | 1 / melt | TDC-D157-001 | TC | √ | P | H | H | --- | |
| 2.9 | Tensile at RT (EN ISO 6892-1) | Tensile Strength, Yield Strength (0.2% offset), % Elongation | Destructive Test | As per TDC-D157-001 | | TC | √ | P | H | H | One sample Tube if the total number of tubes is less than 20 , otherwise 2 Number of samples to be taken. | |
| 2.10 | Tensile at 350° C (EN ISO 6892-2) | 0.2% proof strength | Destructive Test | | | TC | √ | P | H | H | | |
| 2.11 | Flattening Test/Ring Tensile Test | Flattening Test/ Ring Tensile Test | Destructive Test | | | TC | √ | P | H | H | | |
| 2.12 | Drift Expanding Test/ Ring Expanding Test | Drift Expanding Test/ Ring Expanding Test | Destructive Test | | | TC | √ | P | H | H | | |
| 3.0 | Final Inspection | | | | | | | | | | | |
| 3.1 | Final Dimensional check of Pipes | Dimensions | Measurement | 100% | Drg No/P.O No: To be filled TDC-D157-001 | TC | √ | P | H | H | | |
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| 3.2 | Visual Inspection of Pipes , Surface Finish | Free from visual defects | Verification and Visual , Surface Finish | 100% | TDC-D157-001 | TC | √ | P | H | H | | |
| 3.3 | Marking | SI No, Heat Number, Material designation, , Supply condition, Inspectors Seal, Manufactures name , P.O Number. | Verification and Visual | 100% | TDC-D157-001 | TC | √ | P | R | R | --- | |
| 3.4 | Mix up Test | Positive Material Identification | PMI Test | 100% | DIN EN 10216-2/1.5415 | TC | √ | P | H | H | | |
| 3.5 | Certification and Documentation Control | Order compliance | Certificate compilation | 100% | TDC-D157-001 DIN EN 10216-2/1.5415 | TC | √ | P | R | R | --- | |
| 3.6 | Documents (Test Certificates) shall be sent to BHEL/Trichy prior to dispatch. Dispatch clearance will be given after Acceptance of Test Certificates by BHEL&NPCIL) | | | | | --- | -- | P | H | H | --- | |
| 3.7 | Packing & Shipment | Packing | Visual | 100% | TDC-D157-001 DIN EN 10216-2/1.5415 | --- | -- | P | -- | -- | --- | |

Note:

- MPP(Manufacturing Process plan), Heat Treatment Plan, NDE Procedures , Hydro Test procedure , MSTP(Material Sampling and Testing Plan) etc. shall be submitted by Supplier and the same will be subjected to both BHEL&NPCIL approval.
- This Quality Plan is applicable for following items (Actual Size & Item list will be as per Enquiry/P.O)
 - PDHRS-Thermal Sleeve: Size: OD114.3X8.56 thick,
 - Feed Pipe-Thermal Sleeve- OD273.1x12.7 thick.
 - Ring Pipe-1 - Size: OD273.1x 9.3 thick
 - Ring Pipe-2 - Size: OD273.1x 9.3 thick
 - Connecting Pipe- Size: OD273.1x 9.3 thick.
 - Pipe-1-Size: OD273.1x 9.3 thick.
 - Half Cylinder-Size: OD273.1x 9.3 thick
 - Pipe for 90° Elbow & 180° Bend. OD273.1x 9.3 thick (If applicable as per enquiry/P. O)
- Chart shall be signed & submitted along with TC. Also calibration records of furnace, thermocouples & recorders shall be submitted for review.

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