



| MANUFACTURER'S NAME & ADDRESS                   |                                | REFERENCE QUALITY PLAN                                                                                                                                                            |          |               |                  |                                                             |                                   |                                                                         |        |                                                       |                                                                        | TO BE FILLED IN BY NTPC     |  |
|-------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------|------------------|-------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------|--------|-------------------------------------------------------|------------------------------------------------------------------------|-----------------------------|--|
| BHEL<br>BHARAT HEAVY ELECTRICALS LTD,<br>BHOPAL |                                | ITEM: OFAF COOLER FOR POWER TRANSFORMERS & REACTORS                                                                                                                               |          | SIGN OF MFGR  |                  | Q.P. NO.: QA/CD/2001/349RQP<br>REV NO. 03<br>DT. 31.05.2017 |                                   | REV NO 03<br>DATE: 21.06.2017<br>PAGE: 2 of 2<br>VALID UPTO: 20.06.2020 |        | REVIEW BY<br>Aman Pandey<br>H. Shekhar<br>S.H. Malani |                                                                        | Q.P. NO. 0000-999-QVE-P-182 |  |
| SL. NO.                                         | COMPONENT & OPERATIONS         | CHARACTERISTICS                                                                                                                                                                   | CLASS    | TYPE OF CHECK | QUANTUM OF CHECK | REFERENCE DOCUMENT                                          | ACCEPTANCE NORMS                  | FORMAT OF RECORD                                                        | AGENCY | REMARKS                                               | P.C.C.                                                                 |                             |  |
|                                                 |                                |                                                                                                                                                                                   |          |               | M                | C/N                                                         |                                   |                                                                         | M      | N                                                     |                                                                        |                             |  |
| 1.6                                             | Fasteners & Gaskets            | a) Compliance to BHEL's Purchase specification                                                                                                                                    | Major    | Verify        | 100%             | BHEL Drg / Purchase Specification                           | BHEL Drg / Purchase Specification | TC                                                                      | V      | -                                                     | All hardware shall be hot dip galvanised, if called in the drawing     |                             |  |
| 2.0                                             | IN-PROCESS                     |                                                                                                                                                                                   |          |               |                  |                                                             |                                   |                                                                         |        |                                                       |                                                                        |                             |  |
| 2.1                                             | Tube Plate Drilling            | a) Layout of Holes<br>b) Size                                                                                                                                                     | Major    | Physical      | 100%             | BHEL Drawing                                                | BHEL Drawing                      | QCR                                                                     | P      | -                                                     |                                                                        |                             |  |
| 2.2                                             | WPS & PQR                      | a) Welding Procedure Spec.<br>b) Welder's Qualification                                                                                                                           | Critical | Verify        | 100%             | ASME-Sec-IX                                                 | ASME-Sec-IX                       | WPS/PQR                                                                 | P      | -                                                     |                                                                        |                             |  |
| 2.3                                             | Fabrication of oil chamber     | a) Fit up<br>b) Weld size visual insp.<br>c) Dimensional check<br>d) DP Test / UT                                                                                                 | Major    | Physical      | 100%             | BHEL Drg                                                    | BHEL Drg                          | QCR                                                                     | W      | V                                                     | 100% witness by BHEL-QC (No Third Party Inspection Agency is allowed). |                             |  |
| 2.4                                             | Shot Blast Cleaning & Painting | a) Pretreatment<br>b) Painting                                                                                                                                                    | Major    | Physical      | 100%             | BHEL Drg                                                    | BHEL Drg                          | QCR                                                                     | W      | V                                                     |                                                                        |                             |  |
| 2.5                                             | Tube Expansion                 | a) Expansion of Tubes                                                                                                                                                             | Major    | Physical      | 100%             | BHEL Drg / Spec                                             | BHEL Drg / Spec                   | QCR                                                                     | P      | -                                                     |                                                                        |                             |  |
| 3.0                                             | FINAL INSPECTION               |                                                                                                                                                                                   |          |               |                  |                                                             |                                   |                                                                         |        |                                                       |                                                                        |                             |  |
| 3.1                                             | Final Assembly Inspection      | a) Pressure test / Leak tightness of joints<br>b) Flushing with transformer oil<br>c) Draining / drying of Cooler<br>d) Visual check<br>e) Dimensional check of complete assembly | Major    | Test          | 100%             | BHEL Drg / Spec                                             | BHEL Drg / Spec                   | QCR                                                                     | P      | W                                                     |                                                                        |                             |  |
| 3.2                                             | Record Review                  | a) Completeness of Assembly                                                                                                                                                       | Major    | Verify        | 100%             | BHEL Drg                                                    | BHEL Drg                          | QCR                                                                     | P      | V                                                     |                                                                        |                             |  |
| 3.3                                             | Identification                 | a) Assembly to be identified with hard punch/Cooler SI No as mentioned in Name plate                                                                                              | Major    | Verify        | 100%             | BHEL Drg                                                    | BHEL Drg                          | QCR                                                                     | P      | V                                                     |                                                                        |                             |  |



  
 QA - Thermal