







| Plant<br><b>MRPL Mangalore</b>   |                       | Client<br><b>MRPL</b>   | Contract Code<br><b>WSS for PFCC Flue Gas</b>  | Document ID<br><b>6723-IEJ-G00-EC-0001-A211</b>           | Contract No.<br><b>66-6723</b>   |   |            |                 |         |            |   |
|--|-----------------------|---|--|---|--|---|------------|-----------------|---------|------------|---|
|   |                       | <b>Indicative Inspection and Test Plan(IITP) for Rubber or PFA Lined Check Valves</b> |  |   | <br><b>ONGC</b><br><b>एन जी सी</b><br><b>MRPL</b> |   |            |                 |         |            |   |
|  |                       |   |  |   |  |   |            | Rev             | 00      | Page       | 1 |
| <p>The tests indicated are general minimum requirements of tkIS India. All Tests, as applicable, have to be performed as specified in the Order, Order Attachments, Codes, tkIS India Specifications, Licensor's Specifications and Standards. In case of discrepancies between the Indicative Inspection Test Plan and the workshop documents Approved / Reviewed by LSTK Contractor, the latter shall apply. The Manufacturer shall be responsible for the required Tests to be performed and for the Inspector to be invited in due time to witness the Tests. The Manufacturer shall try to perform as many individual Tests as possible on same day, provided that the fabrication process permits such a procedure</p> |                       |   |  |   |  |   |            |                 |         |            |   |
| Sr. No.  | Component / Operation | Stage Description   | Characteristics  | Reference Std.  | Acceptance Std.  | Format of Record                          | Inspection |                 |         |            |   |
|  |                       |   |  |   |  |   | Vendor     | LSTK Contractor | TPIA    | PMC/ Owner |   |
| QAP Approval   |                       |   |  |   |  |   |            | Endorse         | Prepare | A          | A |
| 1  | Raw material          | Castings for Body, Cover Disc and Fasteners   | Visual   | MSS-SP-55, Material Specification                         | MSS-SP-55, Material Specification  | Inspection report                         | H          | --              | --      | --         |   |
|  |                       |   | Dimensions   | Drawing   | Drawing  | Inspection report                         | H          | --              | --      | --         |   |
|  |                       | Lining Material   | Chemical, mechanical properties, NDE (RT, DP, MT, Hardness as applicable etc. IGC B for casting / E with micro test for other SS material) | Order Specification, Relevant ASTM Std. &Approved drawing | Order Specification, Relevant ASTM Std. &Approved drawing  | Foundry test certificate RT – Film Review | R          | R               | R       | --         |   |
| 2  | In process            | Machined Components   | Visual & dimension   | Drawing & MSS-SP-55                                       | Drawing & MSS-SP-55  | Inspection report                         | H          | --              | --      | --         |   |
| 3  | Final inspection      | Strip test (1% of offered qty.)   | Visual   | Drawing, order specification                              | Drawing, order specification   | Inspection report                         | H          | H               | H       | --         |   |
|  |                       | Rubber lining properties  | Adhesion, mechanical testing of Rubber   | Applicable Specification / Order specification            | Applicable Specification / Order specification   | Inspection report                         | H          | R               | R       | --         |   |
|  |                       | Visual  | Workmanship / Finish   | MSS-SP-55, Material Specification                         | MSS-SP-55, Material Specification  | Inspection report                         | H          | 100% H          | 100% H  | --         |   |

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|  |                            | Indicative Inspection and Test Plan for Rubber or PFA Lined Check Valves  |  |  |  |                                       |            |                 |        |             |
|   |                            |   |  |  |   |                                       |            |                 |        |             |
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| Sr. No.   | Component / Operation      | Stage Description   | Characteristics                        | Reference Std.                                 | Acceptance Std.   | Format of Record                      | Inspection |                 |        |             |
|   |                            |   |  |  |   |                                       | Vendor     | LSTK Contractor | TPIA   | PMC / Owner |
|   |                            | Dimensions  | Measurement                            | Approved drawing. & specification              | Approved drawing. & specification   | Inspection report                     | H          | H*              | H*     | --          |
|   |                            | Helium and cryogenic test as applicable   | Conformance to requirements            | Drawing, order specification                   | Drawing, order specification  | Test report                           | H          | H-100%          | H-100% | --          |
|   |                            | Pressure test- shell hydro test & high pressure Closure test & Seat opening test at 0.2 Kg f /sq cm from inlet side   | Leak Tightness                         | Applicable testing std./approved drawing       | Applicable testing std./approved drawing.   | Inspection report                     | H          | H*              | H*     | --          |
|   |                            | (1) Spark test, (2)Hardness test of rubber lining   | Visual                                 | Applicable Specification / Order specification | Applicable Specification / Order specification                                    | Inspection report                     | H          | H*              | H*     | --          |
|   |                            | Marking details   | Visual                                 | Approved drawing                               | Approved drawing.   | Inspection report                     | H          | 100% H          | 100% H | --          |
| 4   | Inspection before despatch | Surface preparation & painting  | Paint DFT, shade, etc.                 | Applicable std., Order specification           | Applicable std., Order specification  | Inspection report                     | H          | H               | R      | --          |
|   |                            | 100% Stamping by LSTK Contractor & TPIA and Issue of IRN  | Review of Documents                    | Drawings & order specification                 | Drawings & order specification  | Inspection report & test certificates | H          | H               | H      | --          |
|   |                            | Packing   | Visual                                 | Order specification, manufacturer's std.       | Order specification, manufacturer's std..   | packing slip                          | H          | R               | R      | --          |

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| <div></div>  |  | Indicative Inspection and Test Plan for Rubber or PFA Lined Check Valves |                               |  |   |  |                               |                         | <div><div>ONGC<br/>एन जी सी</div><div>MRPL<br/>मि. र. पी. लि.</div></div> |              |  |
|   |  |  |                               |  |   |  |                               |                         |  |              |  |
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| Sr. No.   | Component / Operation                    | Stage Description  | Characteristics               | Reference Std.                         | Acceptance Std.                                   | Format of Record                           | Inspection                    |                         |  |              |  |
|   |  |  |                               |  |   |  | Vendor                        | LSTK Contractor         | TPIA   | PMC / Owner  |  |
| 5   | Inspection documentation & Issue of IRN  | Valve Test reports, Material Test Certificate                            | Review of Documents           | 100%                                   | As per Applicable Material & Order Specifications | Conformance to Codes & Order Specification | IRN, MTC With back up reports | P                       | H  | R            |  |
| 6   | Final documentation & Despatch Clearance | Compilation of final documents   | Verification for completeness | Purchase Order                         | Purchase Order, Order specification               | Dossier                                    | R                             | R                       | --   | H            |  |
| <p><u>Notes</u></p> <p>LSTK contractor to prepare final QAP based on this IITP, Applicable specifications, standards and codes and submit to PMC for final approval</p> <ol style="list-style-type: none"><li>Testing/acceptance standard shall be as per Order specification, approved drawing, applicable testing standards, viz. EN 12266 part 1 or 2, API 598, etc. Check valves shall be tested to ensure that valves start opening at 0.2 kgf/cm2(g) on the inlet side. Seat Low Pressure Hydro test, if specified.</li><li>*Quantity of check shall be 100% by Vendor &amp; 10% (per Tag, per size, per visit) by LSTK Contractor &amp; TPIA.</li><li>WPS/PQR shall be submitted for LSTK Contractor, TPIA review for all welds including Bypass welds. Bypass valve shall be tested as per the requirements of main valve.</li><li>Helium test for valves shall be in line with EDB-0006</li><li>Statutory requirement and inspection by Statutory Authority, if applicable, the same shall be met. IBR requirements as per EDB 0006 shall be met</li><li>LSTK Contractor may increase percentage of inspection up to 100% if any rejection or non-conformity is observed during sampling inspection or based on past experience with vendor.</li><li>Fire safe valves shall be as per Process requirement.</li><li>In addition to the requirements of IITP, all requirements of Purchase order, material specification, Order specification and Order Technical requirements (Document ID: EDB-0006) for raw material and final product shall be fulfilled. In addition, Material in Hydrogen Service shall comply with the requirements of Annexure F of document EDB-0006. Material in Sour service shall comply with the requirements of NACE MR0103 &amp; MR0175 &amp; EDB-0006.</li><li>Statutory requirement and inspection by Statutory Authority, if applicable, the same shall be met. IBR requirements for EDB-0006 shall be met. Original IBR Forms shall be submitted.</li><li>Hydro test Water quality shall be as potable for CS and LAS. For SS material Chloride shall be 20 ppm max</li></ol> <p>Legends: W - Witness, R - Review, H – Hold, do not proceed until cleared in writing, A- Approval</p> |  |  |                               |  |   |  |                               |                         |  |              |  |
| Prepared by: LE   |  | Devesh Sharma  |                               | Abhi Thomas / T.V. Sundar              |   | Syam N.S.                                  |                               | Syam S                  |  | Neliparambil |  |
| Checked by: LE  |  | Devesh Sharma  |                               | Abhi Thomas / T.V. Sundar              |   | Syam N.S.                                  |                               | Syam S                  |  | Neliparambil |  |