

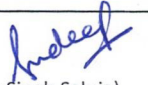


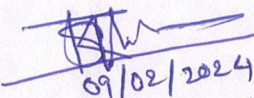
Pre-Qualifying Requirements (PQR)
Threaded Ring (Drg. no. - 21050256101, 21050256102)

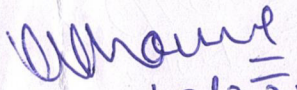
| Sl. No. | REQUIREMENT | VENDOR REMARKS |
|---|---|---|
| 1. | Only those vendors should quote who have following machine, facilities installed & operational at their works for following operations for machining and stelling works of 'Threaded Ring' (Drg. no. - 21050256101, 21050256102). Forging of threaded ring shall be supplied to vendor for machining and stelling works, as per drawing. | Vendor to confirm. |
| 1.A. | Vendor must have suitable toolings / facility such as Marking Table / Machine Bed etc. in good working condition, to facilitate marking of job. Vendor must have suitable facility for lifting / handling subject job. | Vendor to confirm. |
| 1.B. | Turning operation:- | (a) Vendor to confirm. |
| 1.B.i. | Lathe Machine, suitable for turning operations of Threaded Ring at different stages as per drawing, TR & scope of work requirements. | (b) Vendor to provide machine details / specification for referred operation. |
| 1.C. | Milling work:- | (a) Vendor to confirm. |
| 1.C.i. | Milling machine suitable for milling slots at 45 Degrees as per drawing, TR & scope of work requirements. | (b) Vendor to provide machine details / specification for referred operation. |
| 1.D. | Stelling related PQR points from WT end as per Annexure-1 | Vendor to confirm as per Annexure-1 |
| 2 | After groove Stelling, the groove is to be machined as per "3. Contour for surface crack test" & surface testing is to be done. Thereafter, finish turning operation as per "4. Finish Contour" is to be done. | Vendor to confirm. |
| 3 | Vendor to confirm that above machines (as per pt. no. 1.B to 1.D) are available at their works & are in good working condition with capability of achieving accuracies, surface finish & tolerances as per drawing requirements. If necessary, Vendor can suggest alternate machines (other than specified in pt. no. 1.B to 1.D) for machining job with accuracies, surface finish & tolerances as per drawing, for review & acceptance by BHEL. | Vendor to confirm & submit details. |
| 4 | Vendor to confirm that all the dimensions, accuracies & surface finish of the component shall be met as per Technical Requirements & drawing. | Vendor to confirm. |
| 5 | Vendor to note that all tools, measuring equipments, technological items etc. required for manufacturing of subject item shall be arranged by vendor, in case of order. | Vendor to confirm. |
| 6 | BHEL reserves the right to verify the information provided by vendor. BHEL may also visit vendor works if so desired by BHEL. In case, the information provided by vendor is found to be false/ incorrect, their offer shall be rejected. | Vendor to note & agree. |
| <div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="text-align: center;">  (Nadeem Ali) Dy. Mgr. / TTX </div> <div style="text-align: center;">  (Mohammad Fazalhaque) Mgr. / NCT </div> <div style="text-align: center;">  (Sudeep Singh Saluja) Sr. Mgr. / PPC-T </div> </div> | | |

Technical Pre-Qualification Requirement (PQR) for Threaded Ring (21050256101, 21050256102)

Annexure 1

| Sl. | PQR Condition | Documents to be submitted | Vendor's remarks |
|-----|---|--|------------------|
| 1 | Experience Criteria: | | |
| 1.2 | Vendor must have experience of carrying out hardfacing using arc welding (SMAW, GMAW, SAW, GTAW, PTAW) with filler material of stellite 21 (CoCr-E)/ stellite 6 (CoCr-A) / stellite 12 (CoCr-B) / Alloy 625 (Inconel 625) over base material of high alloy steel, for eg., X22CrMoV12-1, X10CrMoVNb9-1, X12CrMoWVNbN10-1-1, X19CrMoVNbN11-1, X13CrMoCoVNbNB9-2-1, GX10CrMoVNb9-1, GX12CrMoWVNbN10-1-1, etc. | Valid WPS & PQR (Performance Qualification Record) developed by vendor for the specified filler material-base metal combination, duly endorsed by third party inspector. | |
| 2 | Manufacturing and testing Facilities Criteria: | | |
| 2.1 | Vendor to confirm that they have adequate in-house facility for hardfacing: arc welding (SMAW / GMAW / SAW / GTAW / PTAW) and furnace (at least 800 deg C temperature capacity) for heat treatment/PWHT to suit the job. | Vendor to confirm adequacy of equipment and also provide details of arc welding and heat treatment/PWHT facility (size, maximum operating temperature, etc) to be submitted. | |
| 2.2 | Vendor must have either in-house facilities or outsourced through NABL accredited laboratory for carrying out all testing on hard-farced component. | Details of in-house testing facilities to be submitted. Testing requiring outsourcing through NABL accredited laboratory to be specified. | |
| 3 | Technical Criteria: | | |
| 3.1 | In case of order placement and before start of work on actual job, Vendor to submit following documents for approval of BHEL: (1) Applicable WPS (Welding Procedure Specification), PQR (Performance Qualification Record) & WPQ (Welder Performance Qualification) as per enquired jobs, duly approved by third party inspector. All testing required in WPS/PQR qualification should be got done through NABL accredited laboratory only. | Vendor to confirm submission of document after placement of order. | |
| 3.2 | Vendor must confirm to supply enquiry items as per enquiry specification and drawing without any deviation | Vendor to confirm | |


09/02/2024
Sushant Kr. Thakur
Manager (WTX)

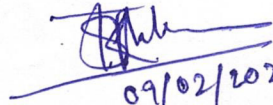

09/02/2024
VIJAY KUMAR
Manager (WTX)

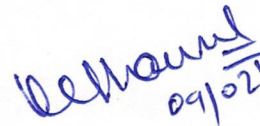
Technical Instructions:

Apart from PQR, following special instruction is to be added in the indent for welding the narrow groove in the Threaded Ring which the vendors have to submit along with the offer.

" Vendor to submit the detailed methodology/ procedure for hardface welding in the narrow groove of the enquired job (Threaded Ring). Vendor may carry out the welding trial on small Carbon steel test piece having same welding groove as of Threaded Ring and submit photographs/ video in support of this. "

BHEL reserves the right to verify the manufacturing facilities and above welding trial at the vendor works. "


09/02/2024
Sushant Kr. Thakur
Manager (WTX)


09/02/24
VIJAY KUMAR
Manager (WTX)

**Technical Pre-Qualification Requirement (PQR) for Valve Seat & Diffuser
(21122211002, 21122211011, 21132102002, 21132111002, 31132002003)**

| Sl. | PQR Condition | Documents to be submitted | Vendor's remarks |
|-----|---|--|------------------|
| 1 | Experience Criteria: | | |
| 1.2 | Vendor must have experience of carrying out hardfacing using arc welding (SMAW, GMAW, SAW, GTAW, PTAW) with filler material of stellite 21 (CoCr-E)/ stellite 6 (CoCr-A) / Alloy 625 (Inconel 625) over base material of low alloy steel for eg, 21CrMoNiV4-7, G17CrMoV5-10, 21CrMoV5-7 etc or high alloy steel, for e.g., X22CrMoV12-1, X10CrMoVNb9-1, X12CrMoWVNbN10-1-1, X19CrMoVNbN11-1, X13CrMoCoVNbNB9-2-1, GX10CrMoVNb9-1, GX12CrMoWVNbN10-1-1, etc. | Valid WPS & PQR (Performance Qualification Record) developed by vendor for the specified filler material-base metal combination, duly endorsed by third party inspector. | |
| 2 | Manufacturing and testing Facilities Criteria: | | |
| 2.1 | Vendor to confirm that they have adequate in-house facility for hardfacing: arc welding (SMAW / GMAW / SAW / GTAW / PTAW) and furnace for heat treatment/PWHT. | Vendor to confirm adequacy of equipment and also provide details of arc welding and heat treatment/PWHT facility (size, maximum operating temperature, etc) to be submitted. | |
| 2.2 | Vendor must have in-house facilities for machining / surface finishing sufficient to meet the requirements of enquired items. These facilities can also be outsourced. | Details of in-house facilities to be submitted. If any of the process is outsourced, same to be specified. | |
| 2.3 | Vendor must have either in-house facilities or outsourced through NABL accredited laboratory for carrying out all testing on hard-farced component. | Details of in-house testing facilities to be submitted. Testing requiring outsourcing through NABL accredited laboratory to be specified. | |

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10/02/2024
Sushant Kr. Thakur
Manager (WTX)

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10/02/2024
VISHAY KUMAR
MGR (WTX)

| Sl. | PQR Condition | Documents to be submitted | Vendor's remarks |
|-----|--|--|------------------|
| 3 | Technical Criteria: | | |
| 3.1 | <p>In case of order placement and before start of work on actual job, Vendor to submit following documents for approval of BHEL:</p> <p>(1) Applicable WPS (Welding Procedure Specification), PQR (Performance Qualification Record) & WPQ (Welder Performance Qualification) as per enquired jobs, duly approved by third party inspector.</p> <p>All testing required in WPS/PQR qualification should be got done through NABL accredited laboratory only.</p> | Vendor to confirm submission of document after placement of order. | |
| 3.2 | Vendor must confirm to supply enquiry items as per enquiry specification and drawing without any deviation | Vendor to confirm | |

| | | |
|--|---|--|
| <p><i>[Signature]</i> TTX (DILIP KUMAR) BY TTX</p> | <p><i>[Signature]</i> 10/02/2024 Sushant Kr. Thakur Manager (WTX) WTX</p> | <p><i>[Signature]</i> 10/02/24 VISHAY KUMAR MGR (WTX)</p> |
|--|---|--|

Technical Instructions:

Apart from PQR, following special instruction is to be added in the indent for specific hardface welding requirements which the vendors need to confirm and submit along with the offer-


As per PQR Clause 3.1, Vendor to submit applicable WPS/PQR & WPQ duly approved by third party for enquired jobs after PO placement but before start of work.

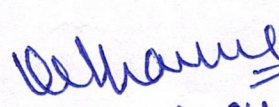
Accordingly, following WPSs are identified in the enquiry job. The same to be communicated to all the vendors for their confirmation - to prepare and send for BHEL review before start of hardface welding in case PO is awarded.

| Sl No. | Item Description | Drawing | Base Material | Filler Material |
|--------|-------------------------|----------------|---------------|-----------------|
| 1 | VALVE SEAT (STOP VALVE) | 21122211002-00 | 21CrMoNiV4-7 | NiCr |
| 2 | DIFFUSER | 21122211011-00 | G17CrMoV5-10 | St21 or Inc 625 |
| 3 | VALVE SEAT | 21132102002-00 | 21CrMoNiV4-7 | NiCr |
| 4 | VALVE SEAT | 21132111002-00 | 21CrMoNiV4-7 | St21 |
| 5 | VALVE SEAT | 31132002003-00 | 21CrMoV 5-7 | NiCr |

Note:

1. For each base material and filler material combination a separate WPS is required.
2. NiCr: NiCro-82 (E-NiCrFe-3) (PZ1 as per TLV 9974 01)
3. St 21: Stellite 21 (PZ4 as per TLV 9974 01)
4. Inc 625: Inconel 625 (PZ17 as per TLV 9974 01)
5. Preheat & PHWT: Both are required as per TLV 9974 01


10/02/2024
Sushant K. Thakur
Manager (WTX)


10/02/2024
VIJAY KUMAR
MGR (WTX)

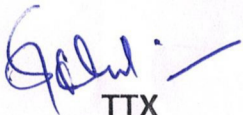

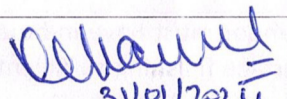
Technical Pre-Qualification Requirement (PQR) for Diffuser

| Sl. | PQR Condition | Documents to be submitted | Vendor's remarks |
|----------|---|--|------------------|
| 1 | Experience Criteria: | | |
| 1.2 | Vendor must have experience of carrying out hardfacing using arc welding (SMAW, GMAW, SAW, GTAW, PTAW) with filler material of stellite 21 (CoCr-E)/ stellite 6 (CoCr-A) / Alloy 625 (Inconel 625) over base material of high alloy steel, for e.g., X22CrMoV12-1, X10CrMoVNb9-1; X12CrMoWVNbN10-1-1, X19CrMoVNbN11-1, X13CrMoCoVNbNB9-2-1, GX10CrMoVNb9-1, GX12CrMoWVNbN10-1-1, etc. | Valid WPS & PQR (Performance Qualification Record) developed by vendor for the specified filler material-base metal combination, duly endorsed by third party inspector. | |
| 2 | Manufacturing and testing Facilities Criteria: | | |
| 2.2 | Vendor to confirm that they have adequate in-house facility for hardfacing: arc welding (SMAW / GMAW / SAW / GTAW / PTAW) and furnace for heat treatment/PWHT. | Vendor to confirm adequacy of equipment and also provide details of arc welding and heat treatment/PWHT facility (size, maximum operating temperature, etc) to be submitted. | |
| 2.3 | Vendor must have in-house facilities for machining / surface finishing sufficient to meet the requirements of enquired items. These facilities can also be outsourced. | Details of in-house facilities to be submitted. If any of the process is outsourced, same to be specified. | |
| 2.4 | Vendor must have either in-house facilities or outsourced through NABL accredited laboratory for carrying out all testing on coated/hard-farced component. | Details of in-house testing facilities to be submitted. Testing requiring outsourcing through NABL accredited laboratory to be specified. | |

[Signature]
31/01/2024

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31/01/2024

| PQR Condition | Documents to be submitted | Vendor's rem |
|--|---|--------------|
| <p>Technical Criteria:</p> <p>In case of order placement and before start of work on actual job, Vendor to submit following documents for approval of BHEL:</p> <p>(1) Applicable WPS (Welding Procedure Specification), PQR (Performance Qualification Record) & WPQ (Welder Performance Qualification) as per enquired jobs, duly approved by third party inspector.</p> <p>All testing required in WPS/PQR qualification should be got done through NABL accredited laboratory only.</p> | <p>Vendor to confirm submission of document after placement of order.</p> | |
| <p>Vendor must confirm to supply enquiry items as per enquiry specification and drawing without any deviation</p> | <p>Vendor to confirm</p> | |

| | | |
|--|--|---|
|  TTX |  31/01/2024 Sushant Kr. Thakur Manager (WTX) |  31/01/2024 VIJAY KUMAR MGR (WTX) |
|--|--|---|

Accepted

Accepted

Technical Instructions:

Apart from PQR, following special instruction is to be added in the indent for specific hardface welding requirements which the vendors need to confirm and submit along with the offer-

“

As per PQR Clause 3.1, Vendor to submit applicable WPS/PQR & WPQ duly approved by third party for enquired jobs after PO placement but before start of work.

Accordingly, following WPSs are identified in the enquiry job. **The same to be communicated to all the vendors for their confirmation - to prepare and send for BHEL review before start of hardface welding in case PO is awarded.**

| SI No | Drg No | Base Mat | Filler 1 | Filler 2 |
|-------|----------------|----------|-----------|----------|
| 1 | 21132152031-00 | P91 | NiCr+St 6 | Inc 625 |

Note:

1. For each filler a separate WPS is required with base material. Accordingly, if a job has mention of Filler 1 & Filler 2, it means, 2 separate WPSs are required for each of the hardface welding fillers with the base material.
2. P91 base material includes: X10CrMoVNb9-1, X12CrMoWVNbN10-1-1, X19CrMoVNbN11-1, GX10CrMoVNb9-1, GX12CrMoWVNbN10-1-1, GX12CrMoVNbN 9-1 etc
3. NiCr: NiCro-82 (E-NiCrFe-3) (PZ1 as per TLV 9974 01)
4. St 6: Stellite 6 (PZ2 as per TLV 9974 01)
5. Inc 625: Inconel 625 (PZ17 as per TLV 9974 01)
6. NiCr+St 6: NiCro-82 as buffer layer + Stellite 6 as filler layer
7. Preheat & PHWT: Both are required as per TLV 9974 01

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