TENDER CORRIGENDUM

TENDER NO.: T/ T206/2/1268W2

TENDER CORRIGENDUM NO.: 202212682_2, Dt-17.03.2023

ITEM.: Piston Ring and Spring Ring

Tender Due date: 03/04/2023 01:45 PM

Corrigendum Details:

Revision-02 instead of revision no.-01 of the PQRs (STE-ST166-01, STE-ST166-02, STE-ST166-03) are applicable for the current Enquiry. Revised PQRs are attached in Annexure-2.

Annexure-2

Description of item:

A) Item Detail: Piston Ring (Sealing Ring with Gap):

Piston Ring (Sealing Ring with Gap), Refer Fig.1 *(Material code-W97310525043)* is made of material CoCr20W15Ni or Equivalent (like Hayness 25) & used for sealing of steam in High Pressure steam turbine in Thermal Power Plant. This item is placed in between HP Inner casing & Outer casing and are subjected to application parameter of temperature 392°C and pressure 75 Bar. This item is used to eliminate / minimise the leakage of steam from turbine and thus helps in improving efficiency of steam turbine.

B) Technical details:

Raw material for the Piston Ring is CoCr20W15Ni, Material-no. 2.4964 acc. to BS HR.40 or Equivalent (like Hayness 25) and melting acc. to AMD 1805.

The Piston Ring shall be delivered in precipitation hardened condition.

Piston Ring with gap design shall have Outer Diameter 1660mm, Thickness 25mm & Width 25mm.

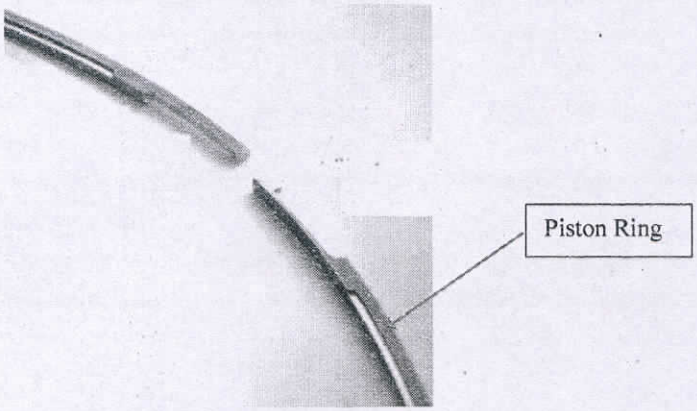

Fig.1. Piston Ring (Sealing Ring) with Gap design

Pre-Qualification Requirements:

Vendor must meet the following experience criteria on the date of enquiry:

1) Vendor should be manufacturer / supplier / authorised dealer and should have executed at least one number Purchase order of fully finish machined Piston ring (Sealing Ring with gap) of size Outer diameter 1000mm or above, made of material CoCr20W15Ni (like Hayness 25) or Equivalent to OEM (Original Equipment Manufacturer) of Steam Turbine of 200MW and above.

   In support of above, supplier has to furnish details as per following Table-1:

Table-1

Sl. No.	Name of Customer	Customer Address	Name, Phone no. and email - Id of contact person	Purchase order No. and Date	Size of Piston ring (Sealing Ring with gap) i.e. Inner Diameter, Outer Diameter & Width	Material of Piston Ring	Qty.

A. Vendor to furnish complete details of any one PO (which is given in above Table-1) for supply of item Piston ring (Sealing Ring with gap). In support of experience vendor to provide following information:

   1. Un-Priced Purchase order (PO) copy (In case of supply to BHEL, PO No. to be provided)

2. Test certificates including drawings or sketch / Certificates of compliance.
3. Acceptance certificate / Dispatch documents for the submitted PO.

2) End User Certificate: Vendor to furnish at least one Certificate from End User certifying that the Piston Ring supplied by the vendor has been in successful operation for at least one year in steam turbine application of 200MW and above. The End User Certificate should be pertaining to the above submitted Purchase Order.

OR

Vendor to provide the document that they are approved vendor of Piston Ring for the OEM (Original Equipment Manufacturer) of Steam Turbine of 200MW or above and at least one Purchase orders must have been executed to that Customer (Supporting Documents: Approved Vendor of OEM certificate and one number Purchase Order copy from same OEM).

3) Vendor to provide point wise technical confirmation in Annexure-1.

General Notes:

1. Supplier to study all drawings & specifications thoroughly as given in the enquiry, before acceptance of PQR clauses.
2. The vendor should furnish all the documents in English language only. If the documents are not in English, then they must be accompanied by duly certified English translations of the same.

Prepared by	Checked by	Approved by
Dinesh Gond	Alok Kr. Singh	D. K. Ray
(Dy. Manager / STE-TE)	(DGM / STE-TE)	(Sr. DGM / STE-TE)

Annexure-1

Sl. No.	Technical Requirements	Supplier to confirm (Yes/ No)
1	Supplier to confirm that delivery of Piston Ring shall be as per BHEL drawing (Drawing no. 01052556341) and all the technical requirements mentioned in drawings & mentioned documents shall be met in totality.	
2	Raw material for the Piston Ring shall be CoCr20W15Ni, Material-no. 2.4964 or Equivalent (like Hayness 25). The Piston Ring shall be delivered in precipitation hardened condition	
3	In annealed condition properties of Piston Ring shall confirm to the following: a) 0.2% Proof strength must be $\geq$ 340 N/mm^2 b) Tensile strength must be $\geq$ 860 N/mm^2 c) Elongation must be $\geq$ 35 % d) Hardness must be $\leq$ 282HB or $\leq$ 290HV	
4	In precipitation hardened condition the hardness of Piston Ring has to be $\geq$ 340HV	
5	In case of any mismatch found in technical requirement / mechanical characteristics/ properties of Piston Ring between material-no. 2.4964 or any other cross referred standard with BHEL drawing requirement, BHEL Drawing) shall prevail.	

HARIDWAR	PRE-QUALIFICATION REQUIREMENTS Item: Spring Ring (with Gap) (Material code- W97310525051: Drawing No. 31052556342)	PQR No. STE-ST166-02 PGMA-10525 Rev.02

Description of item:

A) Item Detail: Spring Ring (with Gap):

Spring Ring (with Gap design), Ref. Fig-1 *(Material code-W97310525051)* is made of material NiCr20Co18Ti or Equivalent (like Nimonic 90) & used for sealing of steam in High Pressure steam turbine in Thermal Power Plant. This item is placed in between HP Inner casing & Outer casing and are subjected to application parameter of temperature 392°C and pressure 75 Bar. This item is used to eliminate / minimise the leakage of steam from turbine and thus helps in improving efficiency of steam turbine

B) Technical details:

Raw material for the Spring Ring (Cockle Spring) is NiCr20Co18Ti, Material-no. 2.4632 acc. to BS 2HR.202 or Equivalent (like Nimonic 90).

The Spring Ring shall be delivered in precipitation hardened condition.

Spring Ring with gap design shall have dimension with Outer convolution edge Ø1608.5mm, Inner convolution edge Ø1559.42mm, Thickness 1.5mm, Width 23.12 & end gap of 25mm

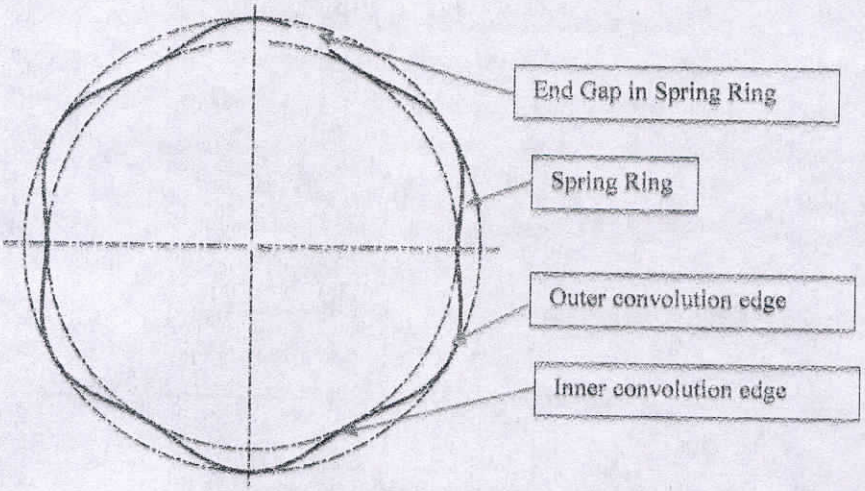

Fig.1. Spring Ring (Cockle Spring) with Gap design

Pre-Qualification Requirements:

Vendor must meet the following experience criteria on the date of enquiry:

1) Vendor should be manufacturer / supplier / authorised dealer and should have executed at least one number Purchase orders of fully finish machined Spring ring (with gap) of size Outer diameter 1000mm or above, made of material NiCr20Co18Ti (like Nimonic 90) or Equivalent to OEM (Original Equipment Manufacturer) of Steam Turbine or Thermal Power Plant of Steam Turbine application in last 10 years as on the date of enquiry. In support of above specified experience requirement, supplier has to furnish details as per Table-1:

HARIDWAR	PRE-QUALIFICATION REQUIREMENTS Item: Spring Ring (with Gap) (Material code- W97310525051: Drawing No. 31052556342)	PQR No. STE-ST166-02 PGMA-10525 Rev.02

Table-1

Sl. No.	Name of Customer	Customer Address	Name, Phone no. and email - Id of contact person	Purchase order No. and Date	Size of Spring ring (with gap) i.e. Outer convolution edge Ø, Inner convolution edge Ø, Thickness, Width & end gap	Material of Spring Ring	Qty.

A. Vendor to furnish complete details of any one PO (which is given in above Table-1) for supply of item Spring ring (with gap). In support of experience vendor to provide following information:

1. Un-Priced Purchase order (PO) copy (In case of supply to BHEL, PO No. to be provided)
2. Test certificates including drawings or sketch / Certificates of compliance.
3. Acceptance certificate / Dispatch documents for the submitted PO.

2) End User Certificate: Vendor to furnish at least one Certificate from End User certifying that the Spring Ring supplied by the vendor has been in successful operation for at least one year in steam turbine application of 200MW and above. The End User Certificate should be pertaining to the above submitted Purchase Order.

OR

Vendor to provide the document that they are approved vendor of Spring Ring for the OEM (Original Equipment Manufacturer) of Steam Turbine of 200MW or above and at least one Purchase orders must have been executed to that Customer (Supporting Documents: Approved Vendor of OEM certificate and one number Purchase Order copy from same OEM).

3) Vendor to provide point wise technical confirmation in Annexure-1

General Notes:

1. Supplier to study all drawings & specifications thoroughly as given in the enquiry, before acceptance of PQR clauses.
2. The vendor should furnish all the documents in English language only. If the documents are not in English, then they must be accompanied by duly certified English translations of the same.

Worked by	Checked by	Approved by
Dinesh Gond	Alok Kr. Singh	D. K. Ray
(Dy. Manager / STE-TE)	(DGM / STE-TE)	(Sr. DGM / STE-TE)

Annexure-1

Sl. No.	Technical Requirements	Supplier to confirm (Yes/ No)
1	Supplier to confirm that delivery of Spring Ring shall be as per BHEL drawing (Drawing no. 31052556342) and all the technical requirements mentioned in drawings & mentioned documents shall be met in totality.	
2	Raw material for the Spring Ring (Cockle Spring) is NiCr20Co18Ti, Material-no. 2.4632 or Equivalent (like Nimonic 90). The Spring Ring shall be delivered in precipitation hardened condition	
3	In precipitation hardened condition properties of Spring Ring shall confirm to the following: a) 0.2% Proof strength must be $\geq$ 695 N/mm^2 b) Tensile strength must be $\geq$ 1080 N/mm^2 c) Elongation must be $\geq$ 15 % d) Hardness must be $\geq$ 280 HV	
4	In case of any mismatch found in technical requirement / mechanical characteristics/ properties of Spring Ring between material-no. 2.4632 with BHEL drawing requirement, BHEL Drawing shall prevail.	

Description of item:

A) Item Detail: Spring Ring (with Gap):

Spring Ring (with Gap design), Ref. Fig-1 *(Material code-W97310525060)* is made of material X10CrNi18-8 or Equivalent & used for sealing of steam in High Pressure steam turbine in Thermal Power Plant. This item is placed in between Shaft seal casing & Outer casing and are subjected to application parameter of temperature 450°C and pressure 6.4 Bar. This item is used to eliminate / minimise the leakage of steam from turbine and thus helps in improving efficiency of steam turbine.

B) Technical details:

Raw material for the Spring Ring (Cockle Spring) is X10CrNi18-8 (solution annealed) or A240 Type-301 or Equivalent.

Spring Ring with gap design shall have dimension with Outer convolution edge Ø776mm, Inner convolution edge Ø768mm, Thickness 1mm, Width 8mm & end gap of 20mm

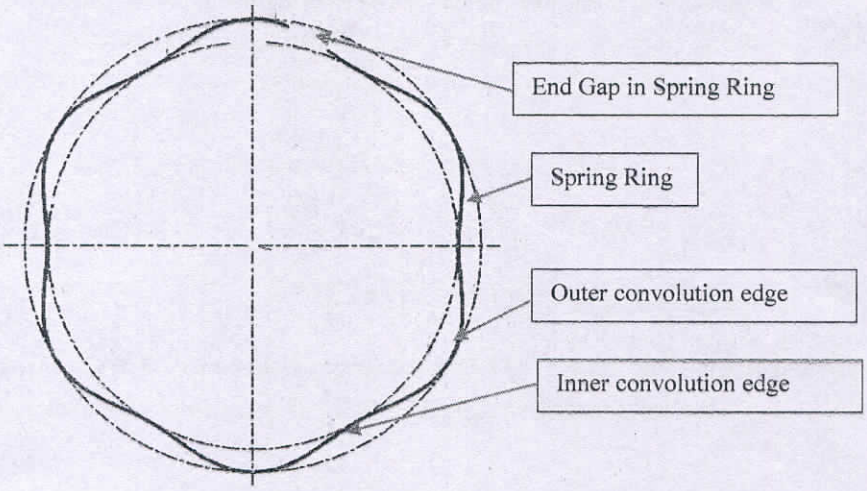

Fig.1. Spring Ring (Cockle Spring) with Gap design

Pre-Qualification Requirements:

Vendor must meet the following experience criteria on the date of enquiry:

1) Vendor should be manufacturer / supplier / authorised dealer and should have executed at least one number Purchase orders of fully finish machined Spring ring (with gap) of size Outer diameter 500mm or above, made of material X10CrNi18-8 (solution annealed) or Equivalent to OEM (Original Equipment Manufacturer) of Steam Turbine or Thermal Power Plant of Steam Turbine application in last 10 years as on the date of enquiry.

   In support of above specified experience requirement, supplier has to furnish details as per Table-1:

   Table-1

Sl. No.	Name of Customer	Customer Address	Name, Phone no. and email - Id of contact person	Purchase order No. and Date	Size of Spring ring (with gap) i.e. Outer convolution edge Ø, Inner convolution edge Ø, Thickness, Width & end gap	Raw material of Spring Ring	Qty.

A. Vendor to furnish complete details of any one PO (which is given in above Table-1) for supply of item Spring ring (with gap). In support of experience vendor to provide following information:

1. Un-Priced Purchase order (PO) copy (In case of supply to BHEL, PO No. to be provided)
2. Test certificates including drawings or sketch / Certificates of compliance.
3. Acceptance certificate / Dispatch documents for the submitted PO.

2) End User Certificate: Vendor to furnish at least one Certificate from End User certifying that the Spring Ring supplied by the vendor has been in successful operation for at least one year in steam turbine application of 200MW and above. The End User Certificate should be pertaining to the above submitted Purchase Order.

OR

Vendor to provide the document that they are approved vendor of Spring Ring for the OEM (Original Equipment Manufacturer) of Steam Turbine of 200MW or above and at least one Purchase orders must have been executed to that Customer (Supporting Documents: Approved Vendor of OEM certificate and one number Purchase Order copy from same OEM).

3) Vendor to provide point wise technical confirmation in Annexure-1

General Notes:

1. Supplier to study all drawings & specifications thoroughly as given in the enquiry, before acceptance of PQR clauses.
2. The vendor should furnish all the documents in English language only. If the documents are not in English, then they must be accompanied by duly certified English translations of the same.

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Dinesh Gond		
Dinesh Gond (Dy. Manager / STE-TE)	Alok Kr. Singh (DGM / STE-TE)	D. K. Ray (Sr. DGM / STE-TE)

Annexure-1

Sl. No.	Technical Requirements	Supplier to confirm (Yes/ No)
1	Supplier to confirm that delivery of Spring Ring shall be as per BHEL drawing (Drawing no. 41052556051) and all the technical requirements mentioned in drawings & mentioned documents shall be met in totality.	
2	Raw material for the Spring Ring (Cockle Spring) shall be X10CrNi18-8 or A240 Type 301 or Equivalent and shall confirm to following condition & properties a) Surface Finish 2E according to EN10028-2, metallically cleaned & descaled. b) Cold rolled and solution annealed c) Tensile Strength min 540 MPa d) Yield strength min 230 Mpa	
3	In case of any mismatch found in technical requirement / mechanical characteristics/ properties of Spring Ring material standard with BHEL drawing requirement, latter BHEL Drawing shall prevail.	