



PROJECT: 3 x 660 MW LPGCL, LALITPUR(U.P) STPP

**TECHNICAL SPECIFICATIONS FOR VIS  
FOR TD BFP(6 NOS.) FOUNDATION**

SPECIFICATION NO. PE-TS-375-614-C001

VOLUME II B

SECTION C

REV.NO. 0 DATE 29-09-2011

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**SECTION 'C'**

**SPECIFIC TECHNICAL REQUIREMENTS**





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**1. General Requirement**

- 1.01. Vendor shall note that TDBFPs (6 Nos.) shall have vibration isolation system (spring mounted). The input drawings of the TDBFP are listed in Table-1. Vendor shall note that there may be minor changes in the location and loading of gear box.

Table-1

<u>Sl. No</u>	<u>TITLE</u>	<u>DRAWING NO.</u>
1	FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE	HY-TC-MPA1024-0111 (R01) SHEET 1/3.
2	FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE	HY-TC-MPA1024-0111 (R01), SHEET 2/3.
3	FOUNDATION ARRANGEMENT FOR BFP & DRIVE TURBINE	HY-TC-MPA1024-0111 (R01), SHEET 3/3.
4	GENREAL ARRANGEMENT OF TD BFP SET	HY-DG-18000-57452

- 1.02. Vibration isolators of proven performance shall be provided by the bidder for preventing transmission of vibrations from one equipment to the other neighbouring equipment and structures.

**2. Seismic Loading:**

The lateral forces will be established in accordance with the recommendations of IS-1893:2002. The site falls in seismic Zone-III (zone factor 0.16) as per IS 1893:2002. Importance factor (I) shall be taken as 1.75 (Table 2 of IS 1893 (PART IV): 2005).

**3. Wind Loading :**

Wind loading will be in accordance with Indian Standard Code IS: 875 (Part 3) for a basic wind speed of 47 m/sec.

**4. Material of construction**

- Grade of Concrete M30.
- Reinforcement shall be high yield deformed bars of grade Fe 500 confirming to IS: 1786.

**5. Documents to be submitted by vendor**

- Soft copy of all documents/drawings shall be furnished in pdf and AutoCAD format as applicable.
- Hard copies shall also be submitted.
- Submission of civil drawings/documents shall be as mentioned in the Table-2.

Table-2

	Drawings	Documents
For Approval	Soft copy + 6 nos hard copies	Soft copy + 6 nos hard copies
For RFC	Soft copy + 10 nos hard copies	





TITLE:

**STANDARD TECHNICAL  
SPECIFICATION FOR VIBRATION  
ISOLATION SYSTEM**

SPECIFICATION NO. PE-TS-999-600-C026

VOLUME - II B

SECTION - D

REV.NO. 0 DATE 05/07/2010

SHEET 1 OF 5

**VOLUME: II B**

**SECTION - D**

**SUB-SECTION - D26**

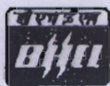
**VIBRATION ISOLATION SYSTEM**

**SPECIFICATION NO. PE-TS-999-600-C026**



**Bharat Heavy Electricals Limited**  
Project Engineering Management





TITLE:

**STANDARD TECHNICAL  
SPECIFICATION FOR VIBRATION  
ISOLATION SYSYTEM**

SPECIFICATION NO. PE-TS-999-600-C026

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5.00.00	Quality Plan and Test Certificate	5
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SPECIFICATION NO. PE-TS-999-600-C026

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**VIBRATION ISOLATION SYSTEM****1.00.00 SCOPE**

This section covers supply, supervision of erection/ commissioning & design engineering of the vibration isolation system (VIS) suitable for ID/PA/FD Fans/ TDBFP/MDBFP/TURBOGENERATORS/MILLS .The vibration isolation system shall be of proven make and should be in successful operation for similar machines.

**2.00.00 Supply of VIS**

VIS shall be supplied complete along with recommended spares if any. The selection of VIS shall be done by the vendor, in case not done by customer , so that the amplitude at bearing locations are within permissible limits as per machine supplier recommendation or ISO10816 whichever is governing and no dynamic loads are transferred to the structure supporting VIS. Minimum 90 % isolation shall be achieved and the system shall be capable of withstanding Seismic/Wind forces.

**3.00.00 Supervision of Erection and Commissioning****3.01.00 Manual**

Vendor shall supply installation and maintenance manual indicating equipment, procedures etc. necessary for installation and replacement of VIS with downtime involved.

**3.02.00 Tools and facilities**

Vendor shall supply all tools and facilities as required for successful erection and commissioning of VIS. Vendor shall deploy experienced manpower to supervise successful installation of VIS

**4.00.00 Design Engineering of Vibration Isolation System****4.01.00 Dynamic Analysis**

The dynamic analysis shall consist of free vibration analysis and forced vibration analysis. Isolation efficiency of at least 90 % shall be obtained. The fundamental natural frequency shall be sufficiently above or below the





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frequency corresponding to operating speed. Vibration amplitude shall be calculated at all bearing locations and shall satisfy the permissible limits as per ISO 10816 or as specified by the machine supplier. Transient analysis shall be carried out for the short circuit /blade failure condition with an appropriate force function if required by the machine supplier. The forces for which substructure is to be designed shall be furnished.

**4.02.00 Static Analysis**

The static analysis shall include the

- a) Dead weights of machine stationary parts,
- b) Dead weights of machine rotary parts
- c) Loads due to machine power torque
- d) Loads due to maximum allowable unbalance
- e) Temperature loads
- f) Loads due to blade unbalance/short circuit
- g) Erections loads
- h) Seismic Loads
- i) Any other loads given by the supplier

Various load combinations must be investigated to obtain the most severe loads for foundation design purpose as per relevant IS codes or as per machine supplier recommendation whichever is more critical.

**4.03.00 Check for Shaft Misalignment**

Foundation deck must be adequately stiff to withstand all operating load combinations without excessively upsetting the rotor shaft alignment. The structural design must carefully be analysed for relative deflection for the members supporting machine shaft to satisfy the limits as given by machine supplier if any.

**4.04.00 Design of RCC deck supported on VIS**

Vendor shall provide General arrangement drawing of deck showing location and supporting detail of VIS, all embedment and their details as per the machine supplier drawing.

RCC design shall be done by working stress method for all machine foundations. Minimum reinforcement shall be governed by IS : 2974 as well IS : 456.

All documents/drawings shall be supplied in 25 (twenty five) prints. All calculations shall be supplied in 6 (six) sets. Soft copy of the drawings in Auto Cad shall be supplied along with the soft copy of the documents supplied





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All documentation shall be in English language and all RCC/structural design shall be conforming to the relevant Indian Standard Code of practice.

**5.00.00 Quality Plan and Test Certificate**

Vendor shall furnish the quality plan and Test certificate for the hardware in their scope of supply. The quality plan shall be reviewed by BHEL /Consultant wherein the inspection and hold points shall be indicated. Vendor shall submit test certificate based on approved Quality Plan. Despatch of material by the vendor shall only take place after the receipt of Material Dispatch Clearance Certificate (MDCC) issued by BHEL/Consultant on the basis of test reports/test certificates submitted by the Vendor after manufacture.

**6.00.00 Environmental Protection**

VIS shall be suitably protected against environmental damages e.g. abrasion, discolouration, corrosion, oily water etc. to give a prolonged service matching the plant life.