1.0 GENERAL & SCOPE

1.1 This specification covers the design, material, construction features, manufacture, inspection & testing, Painting and packing requirements of Spring Loaded Bypass Valves at vendors or his sub vendors works and delivery to project site. The specific Technical requirements of a particular project are listed in attached Annexure-A (Sec-C) and shall prevail over this Sec-D.

1.2 SCOPE OF SUPPLY:- All Spring Loaded Bypass valves shall be supplied as specified in the "Requirements of Spring Loaded Bypass Valve" / "Data sheet for Spring loaded bypass valves attached as Annexure-A (section 'C') of this specification.

1.2.1 COMMISSIONING SPARES
The above mentioned Data Sheet for spring loaded bypass valves (refer 1.2 above) indicate only the actual technical parameters, however, the Commissioning Spares to be supplied along with Main Valves, shall be, as specified in the attached Annexure-A/ Sec-C of this specification (Vol IIB).

Commissioning spares, for each main valve, comprise of one set of gasket, one set gland packing for main valve. These commissioning spares are required at site during erection & commissioning of these valves. The bidders are also required to quote separately the Unit rates of these Commissioning Spares for future ordering by BHEL.

1.2.2 RECOMMENDED SPARES
An offer for Recommended Spares for Spring loaded bypass Valves with part name & qty, as recommended by the bidder for 3 years operation shall be submitted with unit rates with a validity for 1 years (Base firm price+PVC).
Bidders to submit list of these Recommended Spares for valves (other than above mentioned commissioning spares) indicating clearly the valve part name & its Qty of each spare part, as recommended by the bidder, for 3 years operation. The details of these Recommended Spares are required by BHEL/Customer for future ordering.

2.0 STANDARDS:

The valves covered under this specification shall be of manufacturer’s own design and shall meet the required technical details as mentioned in Data sheets. However BS:759 shall be referred to wherever applicable.

3.0 DESIGN CONDITIONS:

The valves covered under this specification shall have the temperature and pressure ratings such as to meet the maximum working conditions as stipulated in the valve data sheets. The operational requirement and special features shall also be as per valve data sheet.

4.0 CONSTRUCTION FEATURES:

4.1 Type of the valve and materials of construction of body and trim shall be as specified in valve Data sheet.

4.2 The seat and disc shall be easily removable and shall be suitable for easy relapping.

4.3 Valves shall have pressure seal bonnet / bolted bonnet construction and the adjusting screw shall be covered under a cap.

4.4 An arrow indicating the direction of flow shall be embossed on the body of the valves.

4.5 A metallic (stainless steel plate 2mm thick) nameplate shall be fitted on each valve. Nameplate inscription required for each valve shall be indicated at the contract stage. Inscriptions shall be engraved 1 mm deep filled with enamel paint.

4.6 Suitable lifting lugs and eye bolts shall be provided for handling of valve.
5.0 MANUFACTURE OF VALVES:

5.1 Particular care shall be taken to ensure that all foundry sand and loose material is properly removed from castings by fettling before the valves manufacture is started.

5.2 After the award of the order, all the valves shall be manufactured strictly in line with the technical specification and the standard governing the valves.

6.0 LUBRICATION:

6.1 Lubrication, if any, required for smooth and easy operation of valves shall be mentioned.

6.2 Choice of lubrication shall be based on ambient temperature condition of 50°C.

6.3 Type of lubricant to be used and its annual consumption (based on 100 operations per year) shall be indicated by the tenderer.

7.0 SHOP INSPECTION:

7.1 A standard quality plan indicating our minimum requirements for shop inspection & testing is attached. Vendor to sign a copy of the same and return with their offer as a token of their acceptance which shall form part of the contract.

7.2 The items covered under this contract shall be subjected to inspection, testing and quality surveillance. The Inspection Agency shall, at all reasonable times have access to Vendor's works, Quality Control records and all facilities as reasonably required for carrying out the inspection and testing efficiently, and these shall be provided by the vendor free of cost.

7.3 Valves coming under the purview of IBR shall be inspected by Independent Inspecting authority approved by Indian Boiler Board and the test Certificate in IBR Form III-C duly countersigned shall be submitted. The Independent Inspecting Authority proposed by the vendor shall be informed in the offer.

7.4 All steel casting and forgings shall be procured by the valve manufacturer from reputed parties and observing strict quality control.

8.0 SCOPE OF SHOP INSPECTION:

The scope of Shop inspection shall generally include but not be limited to the following:

8.1 Material identification, correlation and certification for important components such as body, bonnet, stem and other trim material as per the governing code.

8.2 For the material of components other than those listed under clause 8.1 above, conformance certificate (certifying the materials exactly as per the technical specification of the order/certified contract drawing) shall be furnished by the vendor.

8.3 NDT REQUIREMENT

8.3.1 NDT requirement of casting, forgings & assembled valves are indicated in quality plan which shall be adopted.

8.3.2 Dye-penetrant test on butt welding ends as per ASTME-165 shall be carried out on 100% of the valves and the results shall show no defects.

8.3.3 Valve trims shall be subjected to magnetic particle/dye penetrant tests after finish machining and hard facing.
8.4 Critical zones of valve castings shall be tested by radiographic Method as per ANSI B16.34.

8.5 Dimensional and functional checks shall be carried out as per approved drawings.

8.6 Hardness of body/disc faces of valves shall be checked.

8.7 Testing of the spring shall be done for stiffness, scragging and dimensions as per BS:759.

8.8 Final inspection of assembly shall be done as per approved drawings. Performance test shall be carried out for the valve to check for smooth operation and effectiveness as envisaged in approved drawings/specification/data sheets.

8.9 A pre-despatch inspection will be carried out for all materials/components/equipments/assemblies at the end of all shop tests to check for:
   a) Verification of completeness and acceptance of all previous tests, inspections and checks performed and satisfactory documentation of the same.
   b) Check of appearance and cleanliness.
   c) Check for identification, painting, preservation and packing.

9.0 TESTS

9.1 All the valves shall be tested hydraulically and pneumatically at the pressures as mentioned in the applicable code/standard adopted by the tenderer.

9.2 Valves of supplier's approved design shall be hydraulically tested at twice the design pressure as a minimum.

9.3 Seat leakage test for valves shall be carried out as per the governing standard. Valves shall show no leakage while testing for seat tightness.

9.4 Any other tests required as per the governing standard adopted by the tenderer.

10.0 PAINTING

Valves shall be painted externally after the necessary testing has been carried out. Just before painting valves surface preparation shall be done as per SSPC-SP-3/ power tool cleaning followed by two coats of Heat Resistant Aluminium paint to Indian standard 13183 Grade-I or equivalent. (Total DFT shall be 80 microns)

11.0 CLEANING, PROTECTION & PACKING FOR DESPATCH

11.1 Suitable rust preventive shall be applied on machined exposed surfaces.

11.2 Valve ends shall be protected from external damage and sealed against the ingress of dirt by means of polythene caps/rubber end protectors.

11.3 Valves shall be packed suitably in sea worthy wooden cases in order to avoid damage during transit and also to ensure resistance against corrosion during shipping/storage at site. ...

11.4 Spare parts shall be packed separately and clearly marked. Spares shall also be suitably packed for transit and long storage period at site.

11.5 Valve Tag Nos shall also be incorporated in all the despatch documents.
12.0 Maintenance spares shall be made available for servicing of valves during life span of valves. Commissioning, mandatory (if any) and recommended spares shall be manufactured and tested strictly in conformity with components used in assembly of main valve.

13.0 INSTRUCTION MANUALS

13.1 The instruction Manuals shall present the following basic information in practical, completed and comprehensive manner prepared for use by operating and/or maintenance personnel.

i) Instruction for initial installation.

ii) Instruction for operation, Maintenance and repair.

iii) Recommended inspection points and periods of inspection.

iv) Ordering information for all replaceable parts etc.

13.2 The information shall be organized in a logical and orderly sequence. A general description of the equipment including significant technical characteristics shall be included to familiarize operating and maintenance personnel with the equipment.

13.3 Necessary drawings and/or other illustrations shall be included or copies of appropriate certified drawings shall be bound in the manual. Tests, adjustment and calibration information, as appropriate, shall be included and shall be identified to the specific equipment safety and other warning notices shall be emphasized.

13.4 A parts list shall be included showing part nomenclature, manufacturer's part number and/or other information necessary for accurate identification and ordering of replacement parts.

13.5 Instruction and parts list shall be legible and prepared on good quality papers.

13.6 The instruction manuals shall be securely bound in durable folders.

13.7 If a standard manual is furnished covering more than the specific equipment purchased, the applicable model should be identified.

13.8 The instruction manual shall include the list of spare parts that have been procured along with the equipment.

13.9 The instruction manual shall include list of all special tools and tackle supplied along with complete drawings and instructions for use of such tools and tackles.

13.10 The instruction manual will require approval of purchaser in the same manner as that for drawings.

14.0 INFORMATION/DOCUMENTS TO BE FURNISHED ALONGWITH THE OFFER.

14.1 The offer must be submitted in required Number of copies along with the following documents.

14.1.1 Relevant drawings for the offered valve showing following information:

i) Standard governing the valve, design pressure/temperature, rating.

ii) Complete cross sectional arrangement of the valve.

iii) Binding dimensions, dismantling clearances and weights.
iv) Bill of material incorporating all the materials of construction of various parts along with BS/ASTM standards to which the materials conform.

v) Special features, if any, as called for in the specifications.

vi) Differential pressure for valves when starting to open and when fully open.

vii) Hydraulic/air test pressure for body/seat and duration of test.

viii) Anchoring arrangement.

ix) Valve sizing calculations to justify seat area selected.

14.1.2 Manufacture’s descriptive and illustrative literature on the type of valve offered.

14.1.3 Standard to which the hydraulic and other test shall comply.

14.1.4 Discharge capacity of the valve at various set pressures.

14.1.5 Operation and maintenance manual for valves.

14.2 “Quality Plan” as referred to at 7.0 above (to be submitted in QP format duly signed & stamped.

14.3 It is also pointed out that the offer submitted without the documents requested above shall be considered as incomplete and shall be ignored for the purpose of technical evaluation.

15.0 DEVIATIONS

The tenderer is required to submit a detailed list of deviations, if any. In the absence of any deviation list from the tenderer, his compliance on all the above specifications will be presumed by the purchaser.