

**TENDER  
SPECIFICATION  
BHEL PSSR SCT 2270**

**FOR**

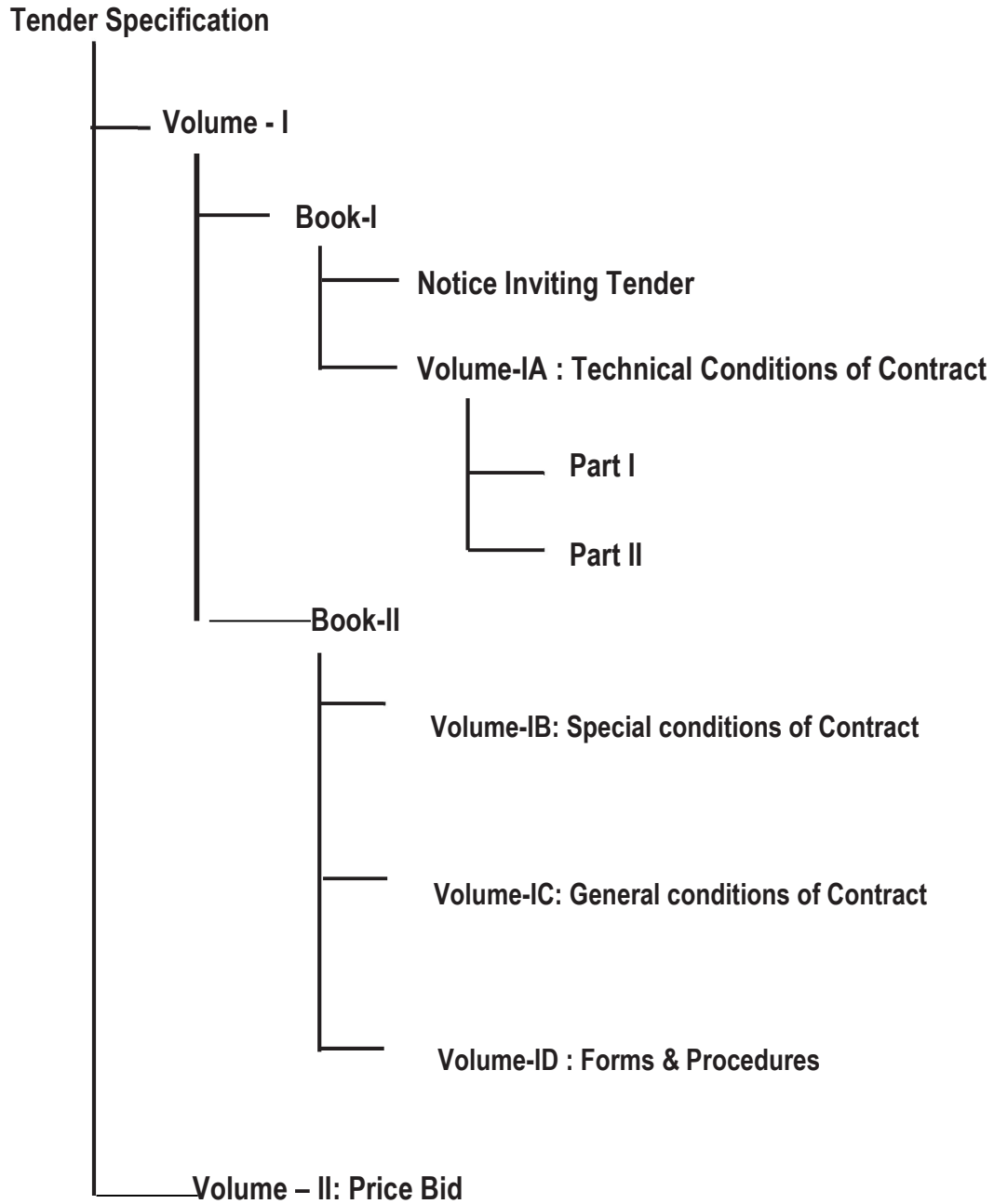
**ERECTION, ALIGNMENT, WELDING, HEAT TREATMENT AND  
NDT OF REACTOR MAIN COOLANT PIPING (MCP) AND  
ASSOCIATED WORKS AT KUDANKULAM NUCLEAR POWER  
PROJECT (REACTOR PACKAGE) UNIT-4, TAMILNADU.**

**PRICEBID  
VOLUME -II**



**BHARAT HEAVY ELECTRICALS LIMITED**  
(A Government of India Undertaking)  
Power Sector – Southern Region  
BHEL Integrated Office Complex, TNEB Road  
Pallikaranai, Chennai -600100

**TENDER SPECIFICATION CONSISTS OF**



## PRICE BID

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## PRICE BID

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### **PART A**

#### **Instruction to Bidders:**

1. Bidders shall only quote “Total Lumpsum amount” in the format given in the price bid. The “Total Lumpsum amount” is for the entire scope of work. Payment will be as per actual quantity executed as certified by BHEL Engineer.
2. Tenderers are requested to affix their company seal and authorized signature in all pages.
3. Bidders shall quote ‘Total Amount’ in the format enclosed as a separate Excel File in BHEL NIC e-Procurement portal for the subject tender and upload the same under ‘Packet details - > Tender covers -> Finance '(Cover Type Description – Price Bid)’ and same shall be taken into account for evaluation and awarding and hence, shall be complete in all respect for the full scope of work defined in specification and in accordance with terms & conditions of the tender. Any other entry elsewhere in the price bid shall be treated as Null and Void. Quoting of rates in any other form/ formats will not be entertained.
4. The above mentioned ‘Total amount’ is for the entire Bill of Quantity (BOQ) given in Part -C of the Price Bid.
5. BHEL has pre-fixed the weightages for the amount of individual items of Bill of Quantity with respect to the ‘Total Amount’ in Part-C.
6. Based on the pre-fixed weightages, the amount for the individual items of the Bill of Quantity shall be arrived at. This amount shall be rounded off to the nearest rupee.
7. Based on the quantities of individual item and the amount arrived in SI No: 6 above, unit rate of individual items shall be derived. This unit rate shall be rounded off to four decimal places.
8. Bidders to note that this is an item rate contract. Payment shall be made for the actual quantities of work executed at the unit rate arrived at as per SI No.7 above.

**Part C : Bill of Quantities**

**Tender Specification for ERECTION, ALIGNMENT, WELDING, HEAT TREATMENT AND NDT OF REACTOR MAIN COOLANT PIPING (MCP) AND ASSOCIATED WORKS AT KUDANKULAM NUCLEAR POWER PROJECT (REACTOR PACKAGE) UNIT-4, TAMILNADU.**

**at 2 X 1000 MWe - KKNPP Unit # 3 & 4 - NIEP Package**

<b>Ref.No.</b>	<b>Description</b>	<b>Unit of Measurement</b>	<b>Qty.</b>	<b>Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount</b>
Sched ule-B 1.3	Erection of main coolant pipe (MCP) line: Handling, dimensional survey, erection of MCP spools connecting RPV to SGs, SGs to RCP pump, RCP pump to RPV for all four loops, establishing optical alignment system, edge preparation, fitup after acceptance of respective equipment erection as per drawings and specification. This work also includes preparation of handling & erection methodology, providing guiding arrangement such as hillmen roller, hydraulic adjusting mechanism for MCP during welding for free movement, monitoring of movement of pipe using optical measurement, dial gauge setup, cutting, trimming of excess length of MCP pipe & edge preparation for four joints per loop using special bevelling machine of compact & sleek design (low clearance-split type), jigs & fixtures for MCP movement guiding. This also includes providing tools & tackles, machineries including alignment equipment, qualified manpower, consumables as per approved procedures and instruction of EIC.	MT	180	.1144147

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
Sched ule-B 1.4	Welding of MCP weld joints insitu: Receipt of free issue welding consumables such as filler wire & coated electrodes, transportation, inspection & preparation of IMIR, storage in temperature controlled closed storage facility, preparation of distortion control & defect repair procedures, providing two qualified welders per joint on each shift for round the clock shift welding, root welding using GTAW process , performing NDT like DPT & RT, weld upto 50% of wall thickness of pipe using SMAW process with pre heating, performing DPT & RT after thermal recovery or hot Radiography, weld up to 100% wall thickness with preheating, perform DPT, RT & UT after thermal recovery / intermediate tempering, performing DPT, RT & UT after Post Weld Heat treatment (PWHT), weld SS cladding inside MCP pipe, perform layer by layer DPT & UT on completed cladding, including weld distortion control through sequential welding, preparation & submission of reports for acceptance as per drawings and technical specification. This work also includes providing one standby welder on each weld joint for two weld joints opposite loop at a time, providing welding & inspection machineries, cooling arrangement for equipment & welders, breathing sets for welders & fume extractors, safe & conducive working atmosphere with approach ladder for movement inside MCP pipe, qualified personnel for NDT inspection, consumables such as argon gas, grinding wheels for welding & inspection for satisfactory completion of work.	JOINT	28	.514418

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Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
Sched ule-B 1.5	<p>Pre-heating and Post Weld Heat Treatment (PWHT) of MCP weld joints using flexible coils Induction Heating (RPV to MCP, SG to MCP,MCP pipe to MCP pipe and MCP pipe to RCP): Design, analysis through Ansys or other softwares for heat load calculation of pre-heating and PWHT of MCP weld joints of various configurations, procurement, qualification of machinaries at factory, supply, transportation of induction heating machines with flexible coils including standby equipment, providing diesel generators (DGs) of required capacity for uninterrupted power supply during welding and heat treatment for complete weld cycle, deploying specilized heat treatment agencies for heat treatment, commissioning &amp; operation of Induction heating machines, flexible coils, chillers for cooling, connected hydraulic piping, supply of PID controllers, temperature recorders, Laptops with monitoring softwares for monitoring of parameters, power controller modules, thermo couples / RTDs of required numbers including standby, compensating cables, thermal insulation etc, for carrying out pre heating and Post weld heat treatment (PHT &amp; PWHT), performing induction heating of weld joints as per approved procedure, drawings and technical specification. This work also includes providing, manpower, machinaries, consumables, DGs with consumables, mandatarly spares required for trouble free operation for round the clock shift work of estimated duration of 9 months and taking back all equipment after completion of heat treatment. Note: Induction heating machines with accesories for MCP welding be provided by BHEL at free of cost.</p>	JOINT	28	.3353243

**Part C : Bill of Quantities**

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**at 2 X 1000 MWe - KKNPP Unit # 3 & 4 - NIEP Package**

Ref.No.	Description	Unit of Measurement	Qty.	Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount
Schedule-B 1.7	<p>Erection, commissioning and operation of electrical automatic change over network including panels, connecting system for welding and heat treatment of MCP: Erection and commissioning of indoor type automatic change over panels, laying of 3.5C x 240/300 Sqmm aluminium conductor XLPE power cable ,including supply of required gland &amp; lugs, glanding and termination , supply and installation of 40mm dia MS rod &amp; 50 x 6 mm GI flat for earthing, construction of closed room for housing DGs &amp; electrical panel for pre-heat treatment &amp; PWHT of MCP weld joints as per approved procedure, drawings and technical specification. This work also includes providing qualified electricians, technicians for round the clock operation, mandatory spares required for trouble free operation for round the clock shift work of estimated duration of 9 months and taking back all equipment after completion of heat treatment. *Note: Automatic Change over Panels &amp; Power cables as required for MCP welding will be provided by BHEL at free of cost.</p>	SET	1	.0128812
Schedule-A 10.3	<p>Design, supply, fabrication, welding of support structures for IHM machines, ladders,temporary structures etc: Design, detailing of structures, evaluating the reaction loads transferred to embedded parts/civil structures. Supply of structural steel material conforming to IS 2062, E250, Quality B0 consisting plates/ sheets/ angle/ channel/ beam, high strength structural G.I. Bolts, nuts, lock nuts and washers, etc, with test reports, transportation, storage, handling, fabrication involving cutting, grinding, bending to required shape, drilling, fitup &amp; welding, inspection, surface preparation by grit blasting, supply &amp; application of zinc primer and epoxy painting as per drawing and technical specifications. This work also includes providing man power, tools, tackles, plant and machineries, supply of welding electrodes, other consumables as required, preparation of reports and submission for acceptance. Note: Manufacturing/fabrication shall start only after the NPCIL designers acceptance.</p>	MT	10	.0159534

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<b>Ref.No.</b>	<b>Description</b>	<b>Unit of Measurement</b>	<b>Qty.</b>	<b>Weightage for amount of each item (Nearest to the 7 decimal points) w.r.t the total amount</b>
Schedule-A 10.4	Erection, field welding and inspection of support structures for IHM machines, ladders, temporary structures, etc: Shifting, handling, erection, fit up & welding using SMAW process, inspection as per drawing and technical specification. This work also includes erection of scaffolding / temporary platforms, machining, providing man power, tools, tackles, plant and machineries, supply of welding electrodes, other consumables, cleaning aids such as high quality kerosene / acetone etc, preparation of reports and submission for acceptance.	MT	10	.0041126
Schedule-C 10.1.5	Sealing of openings for clean room condition	Kg	2,000	.0028958
<b>TOTAL Weightage</b>				1.0