



BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
WATER TURBINE MANUFACTURING DIVISION
MAIN ASSEMBLY, GOVERNOR ASSEMBLY SECTION

NIT No:- WTM/ASSY/GRINDING/1920/002

ANNEXURE-V
SCOPE OF WORK

I) The work includes Grinding/ Chipping and Polishing work in various Hydro (Water) Turbines Like Pelton, Kaplan and Francis Machines and related auxiliary assemblies and sub-assemblies. Major Grinding work involved in Hydro Turbine items involves work such as Grinding in U/S, D/S Body, Door, Weld Edge Preparation in BF valve Door and Body. Polishing of Runner Blades of Francis and Kaplan Runners, Bucket Grinding & Polishing, Template matching with the surface in 1 mm, Blue matching of joint surfaces, deburring, Preparation of Top cover, pivot ring, guide vanes (GV), regulating ring, Lever etc., Collar grinding (equivalent to machining) in GV levers, Guide Vanes. Step Blending in DT Cone, Stay Ring etc. Deburring, step blending in Guide Bearing, Shaft Sealing, Servo Motor (MIV, BF Valve and GV), HP and LP - Pressure Receiver, Nut guard, Rectification of Major Turbine Assemblies, sub-assemblies and its auxiliaries, Bypass Valves (MIV, BFV), Anti-Vacuum Braking Valves, Monorail, Distributor Segment etc. The scope of work may also cover some offloaded works from other product departments of BHEL Bhopal. Technological hours will be certified as per approved technology and quantum of work executed.

Some of the major activities are as follow:-

- Profile Grinding, Polishing in Runner Blades of Francis and Kaplan Runner
- Step Blending in ratio of 1:4 in Spherical Valves (MIV) components like U/S body, D/S Body and Door. In Case of fouling of moving parts material removal by Chipping/Gouging (arc/grinding)) and dressing.
- Bedding of guide vanes.
- Trunnion Collar and profile grinding/polishing of guide vanes and checking with template.
- Step Blending in ratio of 1:4 in Inlet Pipe, Outlet Pipe, Test Cone, Spiral Casings, Top Cover, Pivot Ring, Regulating ring, Levers, pins etc.
- NDT (DPT) of components in weld joints, blade surfaces, plates and defects repairs by gauging, welding and dressing.
- Profile Making with templates of Runner Blades (Francis/Kaplan) in 1mm
- Profile Making with templates in Pelton Runner buckets in 1mm



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- Precision level of Blue matching of joint surfaces of turbine components in 0.02 to 0.03 mm range by scrapping, grinding and polishing.
- Step Blending in ratio of 1:4 and Weld edge Preparation and subsequent dressing, in Butterfly Valves (BFV) components like Valve body, Door. In Case of fouling of moving parts material removal by Chipping/Gouging (arc/grinding)) and dressing.
- Repair/ rectification work in turbine components through gauging, welding and dressing the surface up to machining level.
- Deburring, step blending in Guide Bearing, Shaft Sealing, Servo Motor (MIV, BF Valve and GV), HP and LP - Pressure Receiver, Shaft, Nut guard, Stay Ring, DT Cone, Shaft Seal, Anti-Vacuum Breaking Valve, Distributor segments etc.
 - Prior to Grinding work, cleaning, deburring, any rectification required on the individual components shall be done to avoid any rework.
 - Operator/Dresser should be able to operate high frequency (long neck) grinder, angle (disc) grinder, pneumatic grinder, chipping gun etc.

II) Similar nature of work shall constitute experience in Grinding related work of Water Turbine or its sub - assemblies.

III) Minimum Skilled Manpower required to execute the work per day = 15 Skilled Man

Period of Contract = Up to 30 June 2020 from the date of work order commencement.

Work Commencement: - Within one week from the date of issue of LOI.

Total Required Tech-hrs. = 34158 Tech-hrs.