



be provided at the discharge of the pumps for measurement and control. Complete lime storage, feeding & dosing system shall be in contractor scope. The complete waste water neutralization system shall be automated and controlled from the control room.

#### **4.11.0 Emergency Slurry Tank**

- The bidder shall provide an Emergency slurry tank, sized to contain the complete slurry of one absorber tank at its maximum level equipped with all necessary pumps, valves, piping and controls to transfer the tank's contents back to the absorber to refill the absorber sump. It should be possible to discharge the Absorber into Emergency slurry tank within 2 hours.
- The Bidder shall provide 2x100% pumps to evacuate the slurry from the sump back to the absorber in a maximum time of 8 hours.
- Sufficient number of agitators shall be provided in the tank by the contractor to prevent the solids from settling down. There shall be at least one redundant agitator for this purpose. Type of agitators shall be decided by the Bidder based on the experience and practices followed.
- The tank shall be provided with pump, piping, valves & controls. The tank shall be equipped with opening for easy entry.

#### **4.12.0 Agitators**

- The shaft and blades of the agitators shall be of Alloy 926 or better material suitable to the service condition.

#### **4.13.0 Slurry Pumps**

- This clause covers the design, manufacture and erection of all slurry pumps for the FGD system including the Absorber slurry recirculation pumps, Gypsum bleed pumps, Limestone slurry feed pumps, Mill circuit pumps and any other pump handling slurries.
- The Contractor shall offer only proven design in successful operation in similar application at previous installations. The design, manufacture, installation and testing of the pumps shall follow the latest applicable Indian I International (ASME IEN I Japanese) Standards.
- The pumps shall be designed for continuous operation. The pump shall be single stage centrifugal type capable of delivering the rated flow at rated head with margins as specified in the respective clauses. The slurry concentration in the pump shall not exceed 30% by weight except for Mill circuit slurry pumps for which the slurry concentration in the pump shall not exceed 55% by weight.
- All the slurry pumps shall be provided with motorized suction and discharge valves. In addition, flushing water lines with motorized/ pneumatic valves shall be provided for each pump for automatic flushing of the pump after each shut down. The flushing water for the pumps shall be taken from the process water supply. The process water lines shall be provided with pneumatic/motorized valves as per the proven practice of the Bidder.
- In case of pump with rubber lined casing, the casing should be radially split to allow easy removal of impeller.
- All the pump wear parts in contact with the slurry shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. The Bidder can also offer an hi-



chrome alloy line pump if the Bidder has previous experience of the same for similar applications. The material used by the contractor shall be proven in previous installations.

- For absorber recirculation service a Silicon carbide/hi-chrome impeller and SiC lining for casing can also be accepted if the manufacturer has supplied a similar pump for a previous installation for similar service.
- The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement. All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hrs.
- The design of the shaft shall ensure that the operating speed is at least 20% above the critical speed of the shaft.
- The pump shall be provided with seals of proven type and shall be designed for minimization of seal water consumption. The shaft shall be supported on heavy duty ball/roller bearings.

#### **4.14.0 Slurry Lines and Valves**

- Slurry pipes shall be designed to keep the velocity above the settling velocity under all operating conditions. The Bidder may provide a recirculation line with motorized isolation valve for the above purpose.
- All the pipes handling slurry shall be provided with replaceable rubber lining of proven quality. The Bidder can provide slurry pipes of size lower than 3" made up of FRP material if it has previous experience of providing the same.
- The isolation valves provided in all the slurry lines shall be of knife gate type/butterfly type. Actuator shall be provided as per the scheme provided.
- Bidder shall provide all necessary arrangements for purging & flushing of all the process pipelines, equipments etc.

#### **4.15.0 Process Water/ Slurry Storage Tanks & Pumps**

- From the terminal point Bidder shall provide Booster Pumps of required capacity & head to feed process water storage tank designed for the entire FGD process (including absorber system and mist eliminator washing system, limestone grinding and slurry preparation system, gypsum dewatering ,etc.).
- Process water storage level shall be automatically controlled at operating level by controlling the water flow from the makeup water from terminal point. The process water storage tank shall be designed to store 15 minutes of total maximum water required for the entire FGD process for the unit operating at Design point.
- All the Process water tanks (Process water storage tank, Emergency water tank etc.) shall be designed, fabricated, erected and tested in accordance with the IS:803, latest edition. Additional Corrosion allowance of 1.5 mm on the minimum tank shell thickness as calculated by IS:803, latest edition shall be provided by the Contractor. The Tanks shall be provided with drain, manholes, over flow & inlet level control valves etc.
- 2x100% Process Water Pumps shall be provided for unit connected to Process water Storage tank along with all necessary piping, valves, control & instrumentation. The capacity of the pumps shall be such that it shall meet the maximum process water