+SECTION 23 53 16 - SURGE TANK

SURGE TANK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Surge Tank
 - 2. Surge Tank Trim

1.2 REFERENCES

- A. National Electrical Manufacturers Association (NEMA)
 - 1. NEMA 250 Enclosures for Electrical Equipment
- B. Occupational Safety and Health Administration (OSHA)
 - 1. Fixed Ladders 1917.118
 - 2. Guardrails 1910.23

1.3 SUBMITTALS

A. Submittals shall include:

1. Product Data: Full product description including all accessories and control settings.

2. Drawings: Submit general arrangement drawing; including dimensions, weights and ratings, wiring diagrams, and all other shop related drawings.

3. Include materials of construction of major pressure vessel parts and fittings.

4. Controls Cutsheet: Submit complete set of cutsheets for trims and controls.

5. Rigging instruction: Submit detailed instructions on manufacturers recommended lifting and unloading procedures.

6. Warranty: Submit standard form equipment warranty.

B. Closeout Submittals:

1. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, cleaning procedures, recommended spare parts list, and maintenance and repair information.

2. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements, and include start-up instructions.

3. Test Reports: Indicate surge tank meets or exceed specified performance and efficiency.

1.4 QUALITY ASSURANCE

- A. The packaged surge tank must receive factory tests to check the construction, controls, and operation of the unit.
- B. Allow witnessing of factory inspections and tests at manufacturer's test facility

1.5 DELIVERY, STORAGE, AND HANDLING

A. Cover all openings, leave drain valves in open position, wrap electronics in plastic.

B. Off load surge tank in accordance with surge tank rigging instructions.

1.6 WARRANTY

- A. All equipment is to be guaranteed against defects in workmanship and materials for a period of 12 months from date the equipment is first placed in use, or 18 months from date of completion; whichever shall be less.
- B. 15-year extended warranty for parts and labor on major pressure vessel components.

PART 2 – PRODUCTS

2.1 SURGE TANK

- A. Manufacturers:
 - 1. Superior Boiler Works
 - 2. Cleaver Brooks
 - 3. BFS Industries
 - 4. U.S. Deaerator
 - 5. Industrial Steam
- B. Type: The surge tank shall be of atmospheric design and be able to accept all condensate returns from the entire steam system including gravity returns, pumped returns, and high pressure returns from steam traps if necessary. All returns to the surge tank shall be identified and discussed with the manufacturer to accommodate the system.
- C. Construction:
 - 1. Material: Welded carbon steel.
 - 2. Factory-Applied Insulation and Jacket: Minimum thickness of 2 inches for mineral-fiber pipe and tank insulation. Cover insulation with preformed and

removable sections of painted steel jacket to uniformly follow the contour of the tank. Jacket nominal thickness is not less than 0.030 inch.

- 3. Manway: Surge tank shall have a 12" by 16" elliptical manway in storage tank, located below the normal water level, but near the tank centerline, and away from internal piping. Manway location must allow unrestricted access to tank interior with no interference from internal equipment and piping and with easy access from outside the tank.
- Support: Steel saddles or legs welded to storage tank with minimum height to provide for the net positive suction head required of the pumps selected. Coordinate location with structural design of building.
- Rigging and Jacking: The surge tank is to be equipped with two lifting eyes, located on the top center line. Provisions for jacking. Jacking locations shall be clearly marked.
- D. Finish: The entire surge tank is to be painted with a high temperature, 400 degrees Fahrenheit minimum, silicone-based enamel.

2.2 SURGE TANK TRIM (ACCESSORIES)

- A. The surge tank is to be fully trimmed by the manufacturer including the following:
 - 1. Companion flanges.
 - 2. Lifting eyes.
 - Pump suction piping with isolation valve, strainer, and flexible connector.
 - 4. Pump discharge piping with check valve, isolation valve, and liquid-filled pressure gauge graduated in pounds force per square inch.
 - 5. Pump-discharge bypass relief valve with orifice plate sized to provide continuous pump operation with boiler feedwater valve closed.

- 6. Tank Overflow Drain: Sized to relieve full capacity at operating pressure.
- Drum level transmitter with PID loop control mounted to the vessel and wired to work seamlessly with the pneumatic makeup water valve.
- 8. Makeup Water: Pneumatic, modulating valve for field mounting with waterlevel controller factory mounted on tank. Provide three-valve bypass and inlet strainer with blowdown valve for field mounting, include a ½" NPT connection upstream and downstream and provide gauges to measure pressure before and after. Equip strainer with a drain to remove pressure for servicing.
- 9. Alarms: High-water-level alarm switch, low-water-level alarm switch, low water cut-off and one alarm bell with silence switch.
- 10. Meters and Gauges: Full-height, Gems Mini Suresite® or similar stainless-steel float column with plastic flags. Liquid-filled thermometer and pressure gauge graduated in pounds' force per square inch accurate to 1% or better.
 - a. Gauges shall be panel mounted easily readable by operator standing at grade adjacent to unit.
- 11. Alarms: High-water-level alarm switch, low-water-level alarm switch, low water cut-off and one alarm bell with silence switch.
- 12. Provision for chemical injection quill.
- 13. Vent: connection for vent shall be on top centerline of the receiver.
- B. Pump(s): Two or more stages, centrifugal diffuser type, direct-coupled, vertical shaft, in-line, base-mounted, motor-driven.
 - A total of ______ transfer pumps shall be furnished. Pump to be electric motor driven and to have a capacity of ______ gpm with a discharge pressure of ______ psig.
 - Motors shall be non-overloading type of sufficient horsepower, drip proof, suitable for operation on 3 phase, 60 cycle, ______ volts, AC. Sealing and/or cooling water shall be provided in accordance with pump manufacturer's recommendations.
 - 3. Pump size shall be based on pump schedule.

- C. Platform and Ladder: If required, provide OSHA approved handrails, guardrails, platforms, and ladders for inspection and maintenance of the tank.
- D. Control Panel:
 - 1. NEMA 250, Type ____ enclosure.
 - 2. Shall have visual indication of status and alarm with momentary test push button.
 - 3. Shall have audible alarm and silence switch.
 - 4. Removable control mounting plate.