

**CITY OF AUSTIN
PURCHASING OFFICE
SCOPE OF WORK
RFP MEA303 RE-BID
FOR
REPLACE UNIT 5 AQUEOUS AMMONIA HEATER SKID**

1. SCOPE AND CLASSIFICATION

1.1. Austin Energy (AE) requires the following for a complete removal, installation and replacement of the Sand Hill Energy Center Unit 5 Aqueous Ammonia Heater Skid. This specification defines the minimum requirements for the design, performance, manufacture, complete assembly, inspection, in-factory testing, packaging, shipping, field testing, initial site start up, and warranty services for this equipment.

1.2. CLASSIFICATION

- 1.3. Complete skid replacement, to included but not limited to, with all piping and control valves, block valves, pressure regulators, differential pressure gauges, fans, motors, vaporizer, electrical & control components and wiring, etc.
- 1.4. All material and design for ammonia skid installation and replacement, including but not limited to, bolts, nuts, anchor bolts, insulation, covers, thermocouples, pressure indicators, flow elements.
- 1.5. Labor, equipment, consumables, and tools required for a complete turnkey job.

2. REFERENCE CODES AND STANDARDS

2.1. Contractor shall design, manufacture, assemble, and test all components of the subject of aqueous ammonia heater skids and skid installation, as is applicable, in accordance with all Federal, State, and Local Laws, codes, regulations, and guidelines including, but not limited to, the following codes, standards, and guidelines including all addenda in effect at the date of the issue of the purchase order unless otherwise stated herein:

2.1.1. ASME	American Society of Mechanical Engineers
2.1.2. ANSI	American National Standards Institute
2.1.3. ASTM	American Society for Testing and Materials
2.1.4. ISO	International Organization for Standardization
2.1.5. DOT	Department of Transportation
2.1.6. IEEE	Institute of Electrical and Electronics Engineers
2.1.7. NEC	National Electric Code
2.1.8. UL	Underwriters Laboratory

3. CONTRACTOR REQUIREMENTS

The Contractor and all sub-contractors shall have been regularly engaged in the manufacturing, installation, and design of utility aqueous ammonia heater skids for at least 10 years and submit five references of jobs similar in scope.

- 3.1. All contractor personnel shall attend a one-time, 20 minute, safety/housekeeping orientation in the SHEC Administration Building prior to beginning any work. Per the Contractor Requirement Handbook.
- 3.2. The contractor shall perform a complete turnkey package for the design, removal, installation and start-up.
- 3.3. The contractor shall provide a crane for the all required work to complete the job.
- 3.4. The vendor shall make certain all supplied lifting appliances (cranes, pulley blocks, gin wheels, etc.) hoists and lifting gear (chain slings, rope slings, etc.) are tested and inspected in accordance with the relevant codes and standards. Records must be available for inspection at any time.
- 3.5. The contractor shall provide all scaffolding (if applicable) to complete the job.
- 3.6. The contractor shall provide all required PPE, forklifts, equipment, welding gases/machines, consumables, and tools to complete the job.
- 3.7. The contractor shall supply a connex for breaks/temporary offices (when applicable).
- 3.8. The contractor shall supply own potable water for breaks.
- 3.9. The contractor shall supply Port-O-Johns for the working crew. A ratio of 1 Port-O-John per 5-man crew/12 hour shift.
- 3.10. The contractor shall correctly recycle or dispose of all metal and debris in containers provided by Austin Energy. PRIOR to the start of the project, the disposal shall be coordinated with the Site Environmental/Safety Consultant or designee.
- 3.11. The contractor shall conform to Austin Energy Hexavalent Chromium Requirements when performing ANY hot work on stainless steel materials or any metals which contain chromium (when applicable).
- 3.12. The contractor shall work under own OSHA approved Hexavalent Chromium program.
- 3.13. When required, the contractor shall supply their own safety PPE.
- 3.14. The contractor shall conform to Austin Energy's Lock-Out/Tag-Out and Hot Work Requirements.
- 3.15. The contractor shall work under own OSHA approved Confined Space Program.
- 3.16. The contractor is responsible for cleaning up the job site to an 'as found' condition.
- 3.17. **NOTE:** Upon job completion the contractor must submit forms (provided by Austin Energy) detailing the following as applicable: portable gas/diesel engines (gallons used and run times for welding, lighting, etc.); types of welding rods (pounds used); acetylene use (in cubic feet); types of blasting media (pounds used); and types of paint/thinner (gallons used).
- 3.18. The Project Manager must be accessible and able to be on site within two (2) hours (while contractor employees are working) when requested by Austin Energy.
- 3.19. The Contractor shall be available to provide on-site assistance (technical support) during removal, installation and start-up to ensure a satisfactory installation (AE requires a minimum of 3 Days)
- 3.20. Contractor shall deliver and install Ammonia Heater Skid to coincide with Sand Hill Energy Center scheduled Spring Outage March 24th, - April 14, 2017.

4. TECHNICAL REQUIREMENTS

- 4.1. All piping shall conform to ASME B31.1 Code.
- 4.2. The fan arrangement shall have an 8 style (separate fan shaft and motor shaft).
- 4.3. The fan skid shall have one flow meter/transmitter downstream of the fan outlets (1).
- 4.4. The fan skid shall have one flow meter/transmitter upstream of the ammonia vaporizer (1).
- 4.5. The motors shall be TEFC 480V 3-PH, 60Hz power. The Contractor shall design the horsepower to match required flow. If required, the Contractor shall design, supply and install ALL electrical components to match motor requirements. The motors shall match existing motor ratings of Class 1 Division 2.
- 4.6. All piping which ammonia touches shall be 304SS. All others shall be CS.
- 4.7. All piping shall be insulated where required for freeze protection or personnel protection.
- 4.8. The contractor shall supply a NEMA 4X junction box, for LOTO purposes, with a local disconnect that would isolate power to each motor.
- 4.9. The contractor shall supply straight radial fan wheels for a surgeless design providing turndown with no pulsation.
- 4.10. The fans shall include gear couplings, shaft seals, round flanged inlet and outlet, heat flingers, OSHA shaft guards, 316L stainless steel fan wheels on 316 stainless steel shafts with static oil lubricated tunnel block BLO bearings.
- 4.11. The fans shall include standard carbo-zinc 11 primer on fan housing and standard shop enamel on fan base, inspection door, 1" diameter housing drain, split housing, and 1/4" thick carbon externally reinforced steel housing.
- 4.12. Each fan shall have actuated dampers at the inlets.
- 4.13. Each fan shall have a manual isolation valve and check valve at the outlets.
- 4.14. The fan wheel and shaft assembly shall be designed to 1.4 critical speed.
- 4.15. The fan housing shall be insulated on lower half to minimize heat conduction to the motor/bearing pedestal.
- 4.16. The fans shall be dynamically balanced to meet or exceed ISO 1040, G2.5.
- 4.17. The fan motor/bearing pedestal is minimum 5/8" thick and machined as an assembly for alignment.
- 4.18. Each fan bearing shall have a local temperature measuring device.
- 4.19. The ammonia vaporizer drip quill shall be removable for maintenance.
- 4.20. The ammonia supply filter shall have a duplex filter with a local DP gauge.
- 4.21. A factory acceptance test shall be conducted (witnessed by AE personnel) at the factory.
- 4.22. The fans shall be furnished with electric motors sized to allow the fans to start with the dampers closed at - 20°F ambient conditions.
- 4.23. The motors shall include space heaters.
- 4.24. Once installed on-site the vendor shall align fan and motor assembly with AE personnel.
- 4.25. The final installation shall include DCS loop check with AE Instrument Technicians and Ammonia Tuning for injections rates to the Ammonia Injection Grid.
- 4.26. All supplied equipment shall have the appropriate heat tracing or freeze protection.

5. PERFORMANCE REQUIREMENTS

- 5.1. The aqueous ammonia is 19.5% WT delivered at 272LB/HR @ 25PSIG & 70DegF.
- 5.2. The exhaust supply gas is approximately 600-750DegF @ 2.5"WG.
- 5.3. The return gas is approximately 300DegF @ 25.0"WG.
- 5.4. Deliver an exhaust gas flow rate approximately 4064 LB/HR @ 660DegF.
- 5.5. The fans shall be designed for 2x100%.
- 5.6. There is approximately 500 feet between the skid and the MCC (Motor Control Center) that feeds the motors. Contractor must field verify.
- 5.7. The cable is three conductor 4 AWG.
- 5.8. The existing Cutler Hammer motor starter has an Eaton IQ 500 solid state overload. Cat.# IQ502A.
- 5.9. The existing breaker is a Cutler Hammer molded case 50 amp HMCP. It has a variable instantaneous trip setting that has 5.8 setting varying from 150 amps to 500 amps.
- 5.10. The motor starter is in a 12" x 18" MCC compartment (bucket).
- 5.11. The MCC is a Cutler Hammer Freedom Series 2100.

6. SKID REQUIREMENTS

- 6.1. Powder coat with a Zinc rich base coat or equivalent.
- 6.2. Top coat shall match 'Sand Hill Energy Center' gray.
- 6.3. Concrete fill skid and motor pedestals.
- 6.4. Supply and design of anchor bolts.

7. QUALITY REQUIREMENTS

- 7.1. To assure that the materials meet the requirements and intent of the specification, Austin Energy reserves the right to review/check specification compliance during Contractor's manufacturing activities.
- 7.2. Contractor shall arrange for Austin Energy to have free access to such material and all parts concerned with the design, supply, manufacture, or testing of the equipment when so requested.
- 7.3. Contractor shall keep Austin Energy informed of the progress of the work and shall notify the Project Manager one week in advance of when the materials will be ready for any testing or inspections.
- 7.4. Austin Energy's review of the work shall in no way relieve the Contractor of their responsibility for compliance with all requirements of this specification.

8. SCHEDULE

- 8.1. After the issuance of a purchase order by Austin Energy, the Contractor shall confirm with the Project Manager the lead time required to supply the materials as referenced in the Contractor's Bid.
- 8.2. The Contractor shall give weekly updates, to the Project Manager, every Friday before 3:30pm. If there is any holiday during that week then the update shall be given the following Monday.
- 8.3. Contractor shall complete removal and installation of the Aqueous Ammonia Heater Skid during the planned Unit 5 Spring outage in 2017.

9. BIDDER REQUIREMENTS AND SUBMITTALS

- 9.1. All bidders shall submit all documents, including bidder's qualification and experience in the subject of ammonia heater skids, as requested in this technical specification.
- 9.2. Bidders' failure to submit any requested document(s) may result in Austin Energy rejecting such bid(s).
- 9.3. Bidders shall submit a delivery schedule with the best estimate of dates and time. The schedule shall include, engineered drawing submittals, any modeling required, material ETAs, removal, installation start time and test completion.
- 9.4. Bidders shall submit a firm fixed price.

10. CONTRACTOR REQUIRED DOCUMENTATION

- 10.1. Upon acceptance of the skid the Contractor shall supply Austin Energy Sand Hill Energy Center with an electronic copy and three (3) Maintenance Manuals.
- 10.2. The Contractor shall supply a recommended spare parts list for all material listed with recommended quantities.
- 10.3. The Contractor shall supply all drawings related to the material and shall supply all FINAL stamped and sealed drawings related to the project by a Texas registered Professional Engineer. NOTE: Red Lines will not be considered final drawings.
- 10.4. The drawings shall be supplied in both hard copy and AutoCAD '.DWG' format copy.
- 10.5. The Contractor shall provide detailed drawings of the ammonia skid.
- 10.6. The Contractor shall provide all performance fan curves and motor performance sheets.

11. AUSTIN ENERGY RESPONSIBILITIES – AE will:

- 11.1. Provide a plot plan drawing.
- 11.2. Provide one roll off container for trash and one roll off for all scrap metal (metals will not be separated).
- 11.3. Provide electrical disconnect/reconnect at Motor Control Center (MCC). The MCC is not located next to the skid.
- 11.4. AE will only Purge Ammonia feed line and disconnect for LOTO. No other line will be disconnected by AE.
- 11.5. Remove and re-install atmospheric monitor located on ammonia skid.
- 11.6. Provide Paint Specifications for Sand Hill Energy Center Gray.

12. WARRANTY

- 12.1. The vendor shall at a minimum warranty the ammonia heater skid and supplied goods against defects in workmanship and materials which become apparent within eighteen (18) months from the date of a satisfactory start up.
- 12.2. The vendor shall supply the labor to repair or replace any supplied goods which are covered in the warranty.
- 12.3. Any deviation from this warranty must be preapproved by Austin Energy
- 12.4. The vendor obligation under this warranty is limited to repairing or replacement for any defectives of supplied goods which may develop under normal and proper use within the warranty period.