

March 19, 2016

2DB000-ARH-EOI 242A

EXPRESSION INTEREST: EOI 2DB000-ARH-EOI 242A

EXPRESSION OF INTEREST (EOI) FOR HANFORD 242-A EVAPORATOR SPARE REBOILER

Washington River Protection Solutions (WRPS) is the Tank Operating Contractor (TOC) for the U.S. Department of Energy Office of River Protection on the Hanford site. The Hanford Site stores mixed radioactive and chemically hazardous waste in large underground tanks. All technology capable of performing this work is welcome to be submitted.

Background:

The 242-A Evaporator is located in the 200 East Area of the Hanford Nuclear Waste Site. Facility construction started in 1974 and operation began in 1977. The current and future mission of the 242-A Evaporator is to support environmental restoration and remediation of the Hanford Site by optimizing the 200 Area double-shell tank waste volumes through radioactive liquid waste volume reduction. To minimize the impacts of a failed reboiler at the 242-A Evaporator, a spare reboiler for the E-A-1 Reboiler is being procured.

Process Description:

The 242-A Evaporator is designed to reduce the waste volume that must be stored in Hanford Tank Farms double-shell tanks (DSTs). This is accomplished through an evaporation process that uses a conventional forced-circulation, vacuum evaporation system operating at low pressure to concentrate radioactive waste solutions.

The waste is pumped from feed tank 241-AW-102 through an underground line to the 242-A C-A-1 liquid/vapor vessel for reduction. The waste enters a recirculation loop in which the main components include a slurry pump, a Reboiler and a liquid/vapor vessel. While under vacuum (40-80 torr), waste is heated in the steam heated Reboiler to a temperature of approximately 120°F. In the C-A-1 vessel, excess water flashes to steam creating product slurry and water vapor. The slurry is transferred from the 242-A Evaporator by the P-B-2 slurry pump, through underground piping, to a DST. The water vapor from the slurry is drawn through two wire mesh de-entrainer pads into a 42-in. vapor line that leads to the primary condenser.

The Reboiler will be positioned in a vertical orientation. Waste enters the Reboiler at the bottom of the heat exchanger, flows through the internal tubes where it exits at the top of the exchanger, and enters the C-A-1 Evaporator Vessel. Counter flowing steam enters at the top of the heat exchanger and exits at the bottom of the exchanger as steam condensate.

Minimum Technical Criteria:

1. Safety Function

The reboiler is considered a safety-significant piece of equipment. Its safety function is to provide confinement of the radiological and chemically hazardous waste it processes. The functional requirement for the Reboiler is no leakage of waste (leak tight pressure boundary). This is accomplished by using a vessel that is designed to the requirements of ASME Section VIII, Division 1. The vessel must be U-Stamp certified.

2. Design Criteria

Requirements:

- a) Design must be in accordance with ASME BPVC Section VIII, Div. 1 and TEMA “C”.
- b) Design pressure shall be 100 psig.
- c) Design temperature shall be 350 °F.
- d) Design corrosion allowance shall be 0”.
- e) Material shall be 304L stainless steel. Other materials for the tube bundle that are compatible with caustic wastes may be proposed for consideration.
- f) Tubes shall be of seamless construction.

Table A provides process parameters.

Table A- Process Parameters

Parameter	Shell Side	Tube Side
Pressure	Working pressure of at least 100 psig.	Working pressure range of 0.0 psia (full vacuum) to at least 20 psig.
Temperature	Working temperature of at least 350° Fahrenheit.	Working temperature of at least 250° Fahrenheit.
Fluid	Saturated steam (15 psig, 250 ° Fahrenheit).	Radioactive and hazardous wastes (~13 pH, heated to up to 140° Fahrenheit).

3. Space Constraints/Location of Installment

See attached drawing for heat exchanger details. Highlighted characteristics:

- The heat exchanger will be installed in a vertical orientation,
- Rooftop access to the facility. The vessel will require lifting points,
- Four vessel supports required.

Quality Assurance:

Fabrication of the heat exchanger must be performed under a quality assurance program in compliance with ASME NQA-1A-2009.

Drawings are attached to show tube layouts and heater with vapor belt for evaporator crystallizer.

Expression of Interest Submittals:

Interested firms are invited to submit an expression of interest letter to include a response to the following:

1. General descriptions of your capability to design, fabricate and deliver the spare Reboiler.
2. A description of your company's experience with industrial, and/or U.S. Department of Energy applications.
3. A description of your design concept options, selection process, and predicted performance of those options.
4. A description of your proposed location for the fabrication and testing and the capabilities of this site.
5. A conceptual schedule showing proposed sequencing of activities.
6. A Rough Order of Magnitude (ROM) estimate for the total project scope. Included in the ROM shall be estimator's work sheets, vendor information and quotes, and bases of estimates.
7. Provide the above information to the undersigned on or before **May 30, 2016**.
8. The Subcontractor shall also generate a project schedule that identifies all major activities necessary to complete the described work.

This is not a request for proposal, but a request for an expression of interest. Expression of interest letters must be received via email to Alice_R_Hendrickson@rl.gov, Procurement Specialist no later than **May 30, 2016**. Expression of interest responses should be limited to less than thirty pages of information.

Technical questions may be coordinated through the Procurement Specialist in written format to the afore mentioned Procurement Specialist noted above.

WRPS may choose to open discussions with one or more Companies submitting an EOI. WRPS will use these responses to find viable suppliers to work with on this project.

Thank you for your time and consideration.

Alice Hendrickson

Procurement Specialist

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