HANFORD TANK WASTE TREATMENT

AND

IMMOBILIZATION PLANT

BIDDER REQUEST FOR INTEREST & PRE-QUALIFICATION PACKAGE

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May be exempt from public release under the Freedom of Information Act (5 U.S.C. 552), exemption number and category: 4, Commercial/Proprietary
Department of Energy Review required before public release
Name/Org: Jose Velasquez/ P&S Date: 12/28/2023
Guidance (if applicable): N/A

Requisition No. 24590-CM-SCR-EY00-00001

Design of Melter Power Supply (Joule-heater)

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COMPANY NAME: _____

BIDDER REQUEST FOR INTEREST & PREQUALIFICATION CRITERIA AND RESPONSE

1.0 Introduction

Bechtel National Inc., herein referred to as Contractor, intends to issue a Request for Proposal (RFP) for a **Plant Equipment DESIGN** Purchase Order for the Hanford Waste Treatment and Immobilization Plant (WTP) project in Richland, WA. Companies must be pre-qualified by Contractor to be included on the bid list. To support the pre-qualification evaluation process, the prime potential bidder (1st tier subcontractor) must provide the requested information and respond to questions within this document. The Experience Statement should include relevant information for both the prime bidder and any planned lower-tier supplier or subcontractor. Additional supporting documentation such as brochures and company profiles may also be submitted.

***Please note that additional supporting documentation will be required as part of the formal RFP process.**

2.0 Project Description and Location

The Hanford Tank Waste Treatment and Immobilization Plant (WTP) is a complex of radioactive waste treatment processing facilities designed and constructed by Bechtel National, Inc. for the Department of Energy (DOE). The facility will process the Hanford Site tank waste and convert the waste into a stable glass form.

The Project site is located in the 200 East Area of the Hanford Reservation near Richland, Washington, along the Columbia River. The site elevation varies from 662 to 684 feet above mean sea level. Ambient temperature range is -23 degrees F minimum to 113 degrees F maximum, with relative humidity of 5% minimum to 100% maximum. The project design life is 40 years.

Information about the WTP Project can be found on http://www.hanfordvitplant.com.

3.0 Scope of Work

Requisition Number: **24590-CM-SCR-EY00-00001**
Quality Level: CM
Award Type: Preliminary Design -TBD -
Estimated RFP Date: ***March 2026***

Design of Melter Power Supply (Joule-heater)
Work to be included: Preliminary Design

Design Requirements

- The power supplies 800KW shall supply power to a Joule-heated glass melter load by converting three phase power (13.8kV/480V) to variable single-phase output (900KVA, 1P, 360/180V). The output will power two side plate electrodes with extensions that connect to electrical buses on the melter exterior. Power to the electrodes is regulated by maintaining a temperature set-point in the glass pool.
- One power supply shall consist of two independent halves (lineups) that can each produce 50% of the total output power.
- One line-up shall be capable of being energized, while the other line-up is offline.
- Each lineup shall have an input transformer, a control cabinet, a power cabinet and output transformer. The only equipment in common to both lineups shall be the incoming switches and common power supply control modules.
- A normally closed, metal-enclosed tie interrupter switch shall make it possible to operate both halves of the power supply from either of the two 13.8 kV power input sources.
- The HLW melter electrode power supply output shall be ungrounded.
- Cooling to be included in design proposal

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Electrical Requirements

- The BUYER shall provide two independent power feeds for each Melter Power Supply with one feeder normally powering both Melter Power Supply line-ups. BUYER provided power supply requirements are provided in the electrical datasheets and single-line diagram.

Incoming Switches

- The incoming metal-enclosed switches shall be manual operated load break switches in enclosures separated from the input transformers. The switch configuration shall allow either a normal or an alternate BUYER provided power source to power both power supply line-ups. Switches shall be capable of being locked in the open position.

Input Transformer

- Each input transformer shall be sized to safely handle half the required power supply output to the melter. This includes delivered power, power supply and bus system losses, reactive voltage drop, harmonic losses, reserve for low line input conditions, and design margin.

Power Supply Enclosures

- A barrier to the bus bar located above the output breaker within cabinets shall provide physical/electrical separation between the two power supply line-ups.
- Ground bars shall be provided at the bottom or top of each enclosure with provision for connection of all medium voltage cable shields. The ground bars shall made electrically continuous in final melter power supply assembly.

Control Cabinet

- There will be a total of two redundant controller pairs, one for each power supply. Two (for redundancy) managed switch units with fiber-optic capability shall be included to communicate to the BUYER's PCJ system. There shall be a total of four switches. Each controller pair shall have separate switches for the A and B network paths.

Power Cabinets

- The power cabinets shall, in combination with output transformers, meet the conditions detailed in the respective electrical datasheets. Two power cabinets (DC to single phase converter) per lineup shall be supplied (4 total). Each power cabinet shall include, an input 3-phase sine filter, and output single-phase sine filter and gate driver circuit boards.

Output Transformer

- The output transformers shall, in combination with the power cabinets, deliver specified power to melter electrode pairs. Two enclosed output transformers per lineup shall be supplied with each transformer having two secondary windings to optimize the power supply rating.

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- When the system is operating at higher output voltage levels, the two output transformer windings shall be connected in series. At higher current levels to the melter electrodes, the windings shall be connected in parallel.
- Each output transformer shall be sized to safely handle required power supply output to the melter plus delivered power, power supply and bus system losses, reactive voltage drop, harmonic losses, reserve for low line input conditions, and design margin.

Bus Duct

- The Bus Duct shall be enclosed, non-segregated and shall be rated as specified in the respective Datasheet and Single-Line Diagram and shall be manufactured in accordance with ANSI/IEEE C37.23.

Ground Fault Detection

- Provide ground fault detection circuitry to monitor the output circuits of the power supply. This circuitry should be connected at the power output at the isolation switch. Ground fault detection shall provide an alarm contact closure for low resistance to ground from output bus to ground, resulting in the power

Maintenance/Operation

- The design of the Power Supplies shall allow the replacement of all major components, including transformers in one offline lineup, while the non-affected line-up remains energized.
- The online lineup will remain in operation and support the Melter in an idle state, which will prevent the loss of the Melter and vitrification production. This shall include re-design of controls, electrical, mechanical, etc. that are affected.

Output volts

- MMS (Manufacturing Message Specification) output to PCJ. Voltage will be measured at the melter output. Voltage is acceptable from software output display, if it truly represents the output of each power supply at the electrode output and can be verified with voltage measuring devices, portable or otherwise.

Output Current Measurement

- Current transformers shall be supplied on the output of each melter power supply system so that the current in each melter electrode is measured directly.
- The outputs of the current transformers are to be connected to transducers that convert the 5 A secondary CT signal to a mA signal suitable for PCJ analog input.

Output kW

- MMS output to PCJ. kW output is acceptable from software calculation, provided it truly represents the output of each power supply at the electrode extensions and can be verified with power measuring devices, portable or otherwise. Non-contact devices are acceptable for power measurement, provided the range insulation requirements are met, and the instrument is compatible to the sensor.

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Codes

- NFPA 79-2023 National Electrical Code
- UBC-97 Uniform Building Code (UBC) Note: Applicable to the HLW Facility, replace Chapters 1 through 15 and 24 through 35 of the 1997 UBC with corresponding Chapters of the 202 International Building Code (IBC)
- IBC-2021 International Building Code (IBC) Note: For the HLW Facility, the non-structural portions of the 1997 UBC are updated to the 2021 IBC. The 2021 IBC is the follow-on model building code to 1997 UBC and replaces the UBC

Standards

- ASME B31.3 – current version (to be added fro cooling requirements)
- ANSI C37.51 Standard for Switchgear—Metal-Enclosed Low Voltage AC Power Circuit Breaker Switchgear Assemblies—Conformance Test Procedures
- ANSI C37.57 Standard for Switchgear—Metal-Enclosed Interrupter Switchgear Assemblies—Conformance Testing
- IEEE C37.20.1 Standard for Metal-Enclosed Low-Voltage (1000 Vac and below, 3200 Vdc andbelow) Power Circuit Breaker Switchgear
- IEEE C37.20.3 Metal-Enclosed Interrupter Switch
- IEEE C37.23 Metal Enclosed Busways
- IEEE C57.12.01 Standard for General Requirements for Dry-Type Distribution and Power
- IEEE 519 Standard for Harmonic Control in Electric Power Systems
- UL 347A Medium Voltage-Power Conversion Equipment
- UL 347 Medium-Voltage AC Contactors, Controllers, and Control Centers
- UL 50 Enclosures for Electrical Equipment, Non-Environmental Considerations
- UL 1066 Power Circuit Breakers up to 1000 V AC and 1500 V DC Used in Enclosures
- UL 1562 Standard for Transformers, Distribution, Dry-Type - Over 600 Volts
- UL 1598 Luminaires
- UL 508A Industrial Control Panels
- UL 857 Busways
- UL 891 Switchboards – 480V
- NEMA 250 Enclosures for Electrical Equipment, 1000 V Maximum
- NEMA ICS 6 Industrial Control and Systems: Enclosures

Transformers

Please note that this solicitation may result in material procurements and proposals greater than $10,000 and must comply with FAR 52.225-11 Buy American Act – Construction Materials Under Trade Agreements (SEP 2010). If you cannot comply or foresee any issues with compliance, please provide a detailed explanation.

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COMPANY NAME: _____

BIDDER REQUEST FOR INTEREST & PREQUALIFICATION CRITERIA AND RESPONSE

If your company is **interested** in this solicitation, please **proceed to Section 4.0** and complete the below sections as requested. The BNI Acquisition Services Purchasing group is responsible for collection, evaluation, and internal publication of potential bidders' information for the purpose of pre-qualification for all solicitations.

4.0 Response Submittal

4.1 Submission Due Date: **5/8/2025**

Submission Method: Submissions must be received no later than the due date to the Purchasing Representative, Andrea Riste, via email at adriste@bechtel.us. For questions, call (509) 430-9055.

5.0 Pre-Selection Criteria

5.1 Company Response

Prime Subcontractor Company Name: _____

Address: _____

_____

Pre-qualification Contact Name: _____

Phone Number: _____

E-mail Address: _____

DUNS No. (Dun & Bradstreet): _____

5.2 North American Industry Classification System Code (NAICS)

The NAICS (North American Industry Classification System code for this work is **541330**. The SBA size standard for this code is annual revenue of **25.5m**. For pre-qualification purposes, you are a small business if your company's revenues do not exceed **25.5m**.

Business Size Classification (according to U.S. Small Business Administration Criteria)

- ☐ Small
- ☐ Small Disadvantaged Business
- ☐ Woman Owned Small Business
- ☐ HUBZone Business
- ☐ Veteran-Owned Small Business Concern
- ☐ Service-Disabled Veteran-Owned Small Business Concern.
- ☐ N/A – Registered as a Large Business

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5.3 Quality Assurance Requirements Program

Programmatic Quality Assurance (QA) requirements for this purchase orders will be in accordance with Supplier QA program, please mark as aplicable:

n/a	Non-Permanent or Temporary Work - Generally no QA program required
	Commercial Quality - Based on DOE Order 414.1C
	Nuclear Level Quality - Based on ASME NQA-1 2022

A. Does your Company have a written Quality Assurance Program?

☐Yes ☐ No

B. Which QA standards does this program meet? _____

☐ DOE/RW/0333P ☐ ASME NQA-1 ☐ ASME Section VIII ☐ ISO-9000 ☐ Other

C. If selected “other” above, please furnish a copy of its QA Program Table of Contents and a brief summary identifying each of the requirements listed below. The level of rigor applied to the elements shall be commensurate with the risks associated with the Work.

- A description of the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing the Work.
- Personnel Training and Qualifications
- Quality Improvement
- Control of Documents and Records
- Work Processes
- Design
- Procurement
- Product Identification and Traceability
- Inspection and Acceptance Testing
- Control of the Testing Equipment
- Control of Non-Conforming Product
- Corrective and Preventative Actions
- Handling, Storage and Shipping Procedures
- Management Assessment
- Independent Assessment

_____

D. Your company has the option to submit their full Quality Assurance Plan with this interest.

5.4 Commercial Data

Potential bidders are required to register on the Bechtel Supplier and Contractor Portal: https://www.Bechtel.com/supplier/ in order to be considered.

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Date your company registered or updated its information on the Portal?

Date Updated:_____

A. Rough Order of Magnitude for Scope of Work (USD): $_____

B. Estimated Delivery Schedule:

i. Engineering/Design: _____ weeks
ii. Material Procurement: _____ weeks
iii. Fabrication: _____ weeks
iv. Delivery: _____ weeks

C. Are there long lead items to be aware of (if yes, please specify)?

_____
_____

D. Does your company have a suggested alternate offering/product that offers an improvement, is more cost effective, or offers shorter delivery (i.e. “buy what you make”)?

☐ No, we will supply an identical or similar product.

☐ Yes, we have an alternate offering. If so, please provide.

_____
_____
_____

E. What risks do you foresee with this procurement that BNI should be aware of and possibly help mitigate?_____
_____
_____

Column completion notes for the below, Experience Statement, to be completed by the Prime contractor:

A. Customer Name, Address, Contact Name and Phone No.- So that we may contact as a reference as needed.

B. Work Description and Location- Describe work scope and location, and then indicate if prime or subcontract.

C. Original/ Final Contract Value- Original award value and final closeout contract value.

D. Commencement/ Completion Dates- Provide starting date and actual completion (or forecast if still in progress) by month/year format (e.g., Jan 2006/ Sept 2007)

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COMPANY NAME: _____

BIDDER REQUEST FOR INTEREST & PREQUALIFICATION CRITERIA AND RESPONSE

Customer Name, Address, Contact Name and Phone No.	Work Description and Location	Original/Final Contract Values	Commence/ Complete Dates

6.0 Pre-Qualification Document Checklist

Companies are encouraged to use this checklist to ensure their submittal is complete.

☐ Interest & Prequalification Criteria and Response Package (this document)

☐ QA Program Table of Contents and summary *or* a copy of QA Plan

☐ Additional supporting documentation such as brochures and company profiles.

☐ Direct Relevant Experience Documentation (included in this document or provided as attachment)

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