SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY
REQUEST FOR PROPOSAL
SUBSTATION REPAIRS
RFP 2023-23

Register for Site Visit:	**June 19, 2023 (by 4pm)**
Optional Site Visit:	**TBD (targeting June 22 or 23 at 10am)**
Questions Submitted:	**June 30, 2023 (by 4 pm)**
Q&A Posted:	**July 7, 2023 (by 4pm)**
Proposal Due:	**July 14, 2023 (by 4pm)**

1. PURPOSE:

This Request for Proposal (RFP) is issued by the South Dakota Science and Technology Authority (SDSTA) for repair work in two 69,000-Volt (69kV) substations, including replacement of one 69kV circuit switcher, repair of one 1200-Amp medium voltage (MV) vacuum circuit breaker (VCB), inspection, testing and maintenance (ITM) of three MV VCBs, replacement of three protection relays, testing and calibration of one existing protection relay, and ITM and re-commissioning of one 30 MVA transformer. All equipment is located on the surface property at the Sanford Underground Research Facility (SURF), at the Ross and Oro Hondo 69kV substations.

1.1. An individual firm will be selected by a best value evaluation method for a fixed price contract based on:

A. Total of the quantities and unit costs listed for pricing in Section 6
B. Demonstrated competence
C. Qualifications for the required work

Base pricing shall include those items listed under BASE Scope of Work. Optional pricing is requested for items listed as OPTIONAL Scope of Work. Pricing for optional work will be considered but may or may not be awarded as part of this contract.

1.2. Documents attached to this RFP include:

A. Draft Contract (2023-23)
B. Draft Construction General Conditions Agreement
C. Contractor Pre-Qualification & ESH Questionnaire
D. Exhibits:
   Exhibit A – Ross Circuit Switcher - GEC Alsthom.pdf
   Exhibit B – Ross Transformer - GE 745 Diff Relay r2.pdf
   Exhibit C – Ross 30 MVA Transformer.pdf
   Exhibit D – Ross SPARE CB - GE 1200-Amp VCB.pdf
   Exhibit E – Oro Hondo Transformer - GE 745 Diff Relay.pdf
   Exhibit F – Oro Hondo Circuit Switcher - AEG.pdf

Exhibit G – Oro Hondo 14 MVA Transformer.pdf
Exhibit H – Ross 15 kV Switchgear - VCBs.pdf
Exhibit I – Oro Hondo 15 kV Switchgear - Main VCB r2.pdf

2. PROJECT BACKGROUND:

The Sanford Underground Research Facility (SURF), formerly the Homestake Gold Mine, receives electrical power at 69kV from Black Hills Energy (BHE) to two substations owned by the SDSTA. The Ross substation is located at the intersection of South Mill Street and Houston Street in Lead, South Dakota. The Oro Hondo substation is located along Kirk Road, south of Lead, South Dakota. These substations distribute power at 12,470 volts (12kV) to SURF's Ross and Yates Complexes and to underground facilities.

3. EXISTING CONDITIONS:

SDSTAs substations were built in the 1980s (Oro Hondo) and 1990s (Ross) but have undergone several upgrades and modifications since their original construction. Due to deferred maintenance, equipment failures are beginning to occur at these substations. In 2021 a new 15/20/25 MVA, 69kV to 12kV transformer and 15 kV switchgear were added to the Ross substation for the Long Baseline Neutrino Facility (LBNF) Deep Underground Neutrino Experiment (DUNE) project.

A 69kV GEC Alsthom circuit switcher installed in 1998 at the Ross Substation failed in December of 2021. This circuit switcher supplies power to a 20/27/30 MVA (cooling class ONAN/ONAF/ONAF), 69kV to 12kV GE PROLEC oil type transformer. SURF is currently operating through a tie breaker connected to the LBNF transformer. Due to equipment age and the inability to locate repair parts, SDSTA has determined that the GEC Alsthom circuit switcher should be replaced.

With the Ross circuit switcher out of service, the 30 MVA transformer has been sitting de-energized since December of 2021. The transformer needs to be inspected, tested, and re-commissioned once the circuit switcher has been replaced.

A General Electric Multilin 745 Differential Relay (GE 745) at the Ross Substation that controls the GEC Alsthom circuit switcher has failed and no longer provides transformer overcurrent protection. This GE 745 relay is obsolete and must be replaced.

A 1200-Amp SPARE FEEDER VCB for the GE Power/Vac 15kV switchgear at the Ross substation has a contact stuck in the closed position and is inoperable. This circuit breaker needs to be repaired and made operational.

In the GE Power/Vac 15kV switchgear at the Ross substation three vacuum circuit breakers (VCB), one 2000-Amp MAIN VCB and two 1200-Amp FEEDER VCBs, have not been serviced since 2009. These VCBs need to be tested and adjusted if necessary.

Three GE Multilin 750 Feeder Protection Relays (GE 750) for the GE Power/Vac 15kV

switchgear at the Ross Substation have not been calibrated since 2009. These relays should be tested and calibrated.

A GE 745 relay that controls the 69kV AEG circuit switcher at the Oro Hondo Substation has failed and no longer provides transformer overcurrent protection. This GE 745 relay is obsolete and must be replaced.

The last service date of the 69kV AEG circuit switcher at the Oro Hondo Substation is unknown. This circuit switcher should be serviced and tested.

In the GE Power/Vac 15kV switchgear at the Oro Hondo Substation the 2000-Amp MAIN VCB has not been serviced since 2009. This VCB needs to be tested and adjusted if necessary. The GE 750 protection relay for the MAIN VCB at the Oro Hondo substation has not been calibrated since 2009. This relay should be tested and calibrated.

4. SCOPE OF WORK:

Substation repairs are required at both SDSTA substations. This RFP defines the work scope by substation and separates the work into BASE and OPTIONAL work scope. The optional scope of work may or may not be awarded depending on the total project cost.

The scope of work includes the following:

4.1 BASE Scope of Work

Ross Substation –

a) Replacement of one GEC Alsthom type SW 72.5 circuit switcher with a CRR3 operator mechanism. Due to limited physical space the new circuit switcher must be the same form factor as the existing vertical (candlestick) type a circuit switcher. To minimize substation disturbances, preference is for the new switcher to mount on the existing concrete support piers. Replacement must include testing, adjustment, and commissioning of the new switcher. For specifications refer to the existing circuit switcher information provided in **Exhibit A**.
b) Replacement of one GE 745 Transformer Differential Relay located inside the Ross Substation control building. Information and photographs for the existing GE 745 are provided in **Exhibit B**. Replacement must include testing, calibration, and commissioning of the new protection relay, including verification of correct relay settings.
c) ITM of one GE PROLEC 20/27/30 MVA, 69kV to 12kV transformer. Proposer to recommend testing to be performed. Include energization and commissioning of the transformer. Transformer information and photographs are provided in **Exhibit C**.
d) Repair and ITM of one GE Power/Vac, Type VB1 13.8-500-3, 15kV, 1200-amp, Mechanical Type ML-18, VCB with Vacuum Interrupter Type 50B1. This is the SPARE Feeder Breaker for the GE 15kV Switchgear located in the Ross Substation control building. The center phase is stuck closed. Assume the vacuum interrupter assembly needs replaced. Test and adjust the repaired VCB as necessary. Information and photographs for this VCB are provided in **Exhibit D**.

Oro Hondo Substation –

e) Replacement of one GE 745 Transformer Differential Relay located inside the Oro Hondo Substation control building. Information and photographs for the existing GE 745 are provided in **Exhibit E**. Replacement must include testing, calibration, and commissioning of the new protection relay, including verification of correct relay settings.
f) ITM of one AEG Electric Power Systems, Inc. type S1-72.5-F1/2520 circuit switcher with a CRR3 operator mechanism. Information and photographs for the AEG circuit switcher are provided in **Exhibit F**.
g) ITM of one GE PROLEC 10/14 MVA, 69kV to 12kV transformer. Proposer to recommend testing. Transformer information and photographs are provided in **Exhibit G.**

4.2 OPTIONAL Scope of Work

a) Ross Substation – ITM and calibration of three GE 750 Feeder Protection Relays; one GE Power/Vac, type VB1 13.8-500-3, 15kV, 2000-Amp, mechanical type ML-18, MAIN circuit breaker; and two GE Power/Vac, type VB1 13.8-500-3, 15kV, 1200-Amp, mechanical type ML-18, FEEDER circuit breakers. These relays and VCBs are located inside the Ross Substation control building in the GE 15kV switchgear. Information and photographs for these relays and VCBs are provided in **Exhibit H**. (Note: Relay Settings files are attached to Exhibit H.)
b) Oro Hondo Substation – ITM and calibration of one GE 750 Feeder Protection Relay and one GE Power/Vac, type VB1 13.8-500-3, 15kV, 2000-amp, mechanical type ML-18, MAIN circuit breaker. This relay and VCB are located inside the Oro Hondo Substation control building in the GE 15kV Switchgear. Information and photographs for this relay and VCB are provided in **Exhibit I**. (Note: A Relay Settings file is included as part of Exhibit I.)

4.3 NOTES

a) New protection relay equipment shall be Schweitzer Engineering Laboratories (SEL) brand or approved equal.
b) Replacement Transformer Differential Protection Relay (Minimum) Specifications:
    1. Microprocessor based multi-function relay.
    2. Two-line alphanumeric display.
    3. Quantity and type of digital inputs and outputs to match existing.
    4. Trip and alarm functions to match existing.
    5. Include IRIG-B Time-Code Input capability.
    6. Include front and back EIA-232 communication ports.
    7. Include at least one 10/100BASE-T Ethernet communication port.
    8. Include DNP3, EtherNet/IP, and Modbus communication protocols.
    9. Functions: (Match trip functions utilized in existing relays.)
        a. Two-winding DELTA/WYE Transformer differential overcurrent protection (six phase CTs with 5-Amp secondaries)
        b. Neutral/Ground CT with 5-Amp secondary)
        c. Circuit Breaker status monitoring
        d. Circuit Breaker failure monitoring
        e. Transformer status monitoring and alarming

c) All new equipment must be listed by a Nationally Recognized Testing Laboratory (NRTL.) A list of acceptable NRTLs can be found on the OSHA website at: https://www.osha.gov/nationally-recognized-testing-laboratory-program/current-list-of-nrtls
d) All testing and adjustments must be performed according to manufacturers' specifications and recommendations by a NETA certified testing agency.
e) The contractor is required to provide all necessary tools, materials, lifting equipment, spare parts, personal protective equipment, and labor required to complete the work.
f) The contractor is required to follow SDSTA Environmental, Safety, and Health (ESH) rules and Work Planning and Controls (WPC) procedures, including but not limited to Job Hazard Analysis (JHAs) prior to the start of work. Site specific safety training for all contractor/subcontractor employees working on site is required and will be provided by SDSTA.
g) SURF operates 24/7. Power outages must be held to a minimum. Outage scheduling must be submitted to SDSTA for approval at least 2 weeks in advance.
h) Contractor shall provide training to SDSTA staff in the operation of all new equipment.

5. TECHNICAL EVALUATION CRITERIA:

A best value selection process will be used to award this contract. The selection criteria are listed below. Selection will be made based on tradeoffs between price and non-price evaluation criteria.

A. The offeror's total project package including proposed project team and other technical requirements defined in this document.
B. Specialized experience and technical competence in:
   - Electrical Substation Construction & Installation
   - Repair/Replacement of Medium Voltage Electrical Components
   - NETA Certified Electrical Substation Testing and Commissioning
C. Construction safety practices, procedures, and safety records relating to the scope of work.
D. Qualified professional personnel in the following key areas:
   - Managing Government Contracts
   - Performing work in Energized High Voltage Substations
   - Evaluation and Coordination of Substation Relaying
   - Inspection, Testing, and Maintenance of Substation Electrical Equipment
E. Past performance on SDSTA, US Department of Energy, State of South Dakota, or other contracts with respect to cost control, quality of work, and compliance with performance schedules.

6. SUBMISSION REQUIREMENTS:

Submission Requirement: General

To be eligible for contract award, a firm must be registered as a business entity with the South Dakota Secretary of State.

Proposals should be provided in digital format as a pdf file with standard letter size format. Note

that there is a **50-page limit** for proposals.

Proposals must contain the following:

- Description of the working relationship between each of the overall team members, including a personnel specific organization chart. Note that the named subcontractors and outside associates or consultants must be used for project execution. Any change must be approved in advance by the SDSTA.
- Primary points of contact for the proposed team.
- Description of the approach to cost and schedule control. What tools are used to manage cost and schedule and how is information to be communicated to the project team and SDSTA?
- Any exceptions to the draft contract, terms and conditions, or other RFP materials.
- Travel expenses must be at current GSA rates.

Submission Requirement: Similar Projects

Describe at least two similar projects that the contractor/subcontractor has performed within the past five years. Example projects should be of approximately the same value and duration as proposed for this project. Examples should include:

- Project Title and Location.
- Project Owner and point of contact.
- Period of performance.
- Discuss the relevance of the example projects to this contract.

Submission Requirement: Safety

Provide a description of the safety programs of contractors and subcontractors who would be performing work at SURF under this contract. Safety manuals will not count toward the 50-page limit. Demonstrate the firm's understanding and awareness of all ESH issues that will be present when performing work on this project.

- Identify who will serve as the safety officer for this project.
- Include safety records for the past five years (incident/injury records, OSHA 300 logs, and EMR data) of contractors/subcontractors who would be performing work at SURF under this contract.

Submission Requirement: Quality Control

Provide a description of the QC programs of contractors/subcontractors who would be performing work under this contract. QC manuals will not count toward the 50-page limit.

Submission Requirement: Qualifications

Provide resumes for key personnel proposed for this project. Resumes should include qualification, certifications, and experience in the specific role proposed with relevant projects.

Submission Requirement: Schedule

The total project duration shall be within 365 calendar days of the Notice to Proceed (NTP). Note that liquidated damages of $75/day will be applied for additional schedule delays after the approved contract completion date. Refer to the draft contract for additional details.

Submission Requirement: Price
Provide a project firm fixed price (FFP) breakdown as detailed below:

PRICING:

6.1 BASE scope of work for this RFP (total) **$_____ FFP**

Ross Substation –

a) Circuit Switcher Replacement $_____ FFP
b) Differential Relay Replacement $_____ FFP
c) 30 MVA Transformer ITM $_____ FFP
d) SPARE CB Repair & ITM $_____ FFP

Oro Hondo Substation –

e) Differential Relay Replacement $_____ FFP
f) Circuit Switcher ITM $_____ FFP
g) 14 MVA Transformer ITM $_____ FFP

6.2 OPTIONAL scope of work may or may not be awarded (total) **$_____ FFP**

a) (3) Ross Relays and VCBs ITM $_____ FFP
b) (1) Oro Hondo Relays and VCB ITM $_____ FFP

TOTAL PROPOSAL **$_____ FFP**

The offeror's fixed price shall constitute full payment for the work, materials, services, quality control testing, other items required, and include all applicable federal, state use, sales, and local taxes, duties, permits, bonding, and all the subcontractor's other obligations related to such work.

Submission Requirement: Site Visit

Offerors may request a pre-proposal site visit. Only one site visit will be held, and registration is required. Email bbrack@sanfordlab.org by 4 pm on **June 19, 2023,** to request a site visit date and receive instructions. Contractors and subcontractors are encouraged, but not required, to attend.

7. DELIVERABLES:

Refer to SDSTA Division 1 and other technical specifications for deliverables required after contract award but before the start of work and during project execution. While not a complete list, key deliverables include:

- Safety Plan
- Quality Control Plan
- Construction Schedule
- Schedule of Prices

- Shop Drawings
- Contractor Daily Reports
- Test Reports
- As Built Drawings
- O&M Manuals and Warranties
- Protection Relay Settings Files
- Electrical load flow, coordination, and arc-flash study reports (if applicable).
- Equipment labels per applicable codes and standards.
- Critical spares list that includes itemized pricing, availability, and estimated delivery times.
- Training records for all owner training.
- Copies of training materials developed and used for owner training.

8. PROPOSAL DUE:

Offerors should submit an electronic copy (pdf format) of the proposal no later than 4 pm on **July 14, 2023,** to bbrack@sanfordlab.org. Late submissions will not be accepted.

Questions regarding this requirement are due by 4 pm on **June 30, 2023**.

Questions and answers will be posted to the sanfordlab.org website and emailed to all interested parties no later than 4 pm on **July 7, 2023**.

The proposal period may be extended at the discretion of SDSTA based on the quantity and/or complexity of questions. Please request more time needed during this process and any notices of extension of time will be distributed to all prospective offerors by SDSTA.

All communications regarding this procurement between RFP release and award shall be directed by email to bbrack@sanfordlab.org.

Communication with other SDSTA staff regarding this procurement in advance of the award is not allowed.

Revision History

Rev	Date	Section	Paragraph	Summary of Change	Authorized by
01	1/3/2023	NA	NA	Initial release	CCR 663