

FOR BOARD ACTION

Agenda Item # 5

Meeting Date:

2/28/12

SUBJECT: Northern Hills Substation CapX2020 Line Terminal
Approval of Engineering Services proposal

PREPARED BY: Neil Stiller, Sr. Electrical Engineer

ITEM DESCRIPTION:

The Minnesota Certificate of Need for CapX2020 La Crosse identifies Northern Hills as the end terminal of a 161 kV line originating at the North Rochester substation. In order to meet the requirements of the CapX2020 plan, RPU must expand the existing Northern Hills 161 kV-13.8 kV substation in northwest Rochester to accommodate the CapX interconnection. The project consists of design, construction and placing in service a new 161 kV line terminal and upgrading the existing 161 kV bus rating to 2,000 amp.

Ulteig Engineers Inc. (UEI) submitted a proposal (attached) to perform the detailed engineering for the project. UEI has a long history providing similar services to RPU. They are qualified and able to begin the work.

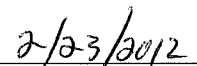
FOR CAPITAL PURCHASES/BIDS/MAJOR PROJECTS:

This project is part of the 2012 Electric budget.

UTILITY BOARD ACTION REQUESTED:

Management requests approval of the Ulteig Engineers Inc. engineering services proposal in the amount of \$196,000.00 for the engineering services required for the Northern Hills Substation CapX2020 line terminal.


General Manager


Date

January 23, 2012

Neil Stiller
Rochester Public Utilities
4000 East River Road NE
Rochester, MN 55906-2813

Subject: Northern Hills CAPX Line Addition – Proposal for Engineering and Design

Mr. Stiller,

Ulteig is pleased to submit this proposal to provide professional engineering services for the Northern Hills substation CAPX line addition. We have carefully reviewed the Engineering Services Agreement and Exhibit A for the Northern Hills substation and have developed this proposal that includes: (1) Project Overview; (2) Proposal Work Plan; (3) Milestone Schedule; (4) Company and Project Team Experience; and (5) Professional Fee. Ulteig is excited to have the opportunity to present to you this proposal for your consideration.

Project Overview

Rochester Public Utilities (RPU), a department of the City of Rochester, intends to expand the existing Northern Hills 161 kV-13.8 kV substation in northwest Rochester to accommodate a new 161 kV CAPX interconnection. The project consists of design, construction and placing in service a new 161 kV line terminal and upgrading the existing 161 kV bus rating to 2,000 amp.

The engineering for this project is broken down into the following major areas of scope:

- (1) Substation – Rochester Public Utilities (RPU) intends to modify the existing Northern Hills 161/13.8kV substation. The modifications will generally consist of adding a 161kV line to the existing ring bus layout to provide an outlet for generation planned in the area. There will be an addition of a 161kV breaker, dead end and 2000A group-operated switch as well as metering and relaying equipment. Additionally, upgrades to the existing substation will be needed to increase the rating to 2000A.

Company Experience

Our team is knowledgeable, experienced with Rochester Public Utilities (RPU) projects, and prepared to perform this work. Throughout the past 10 years, Ulteig has completed 60 projects for RPU. We provide the solutions that RPU requires from their contracted engineer.

Project Team

Attached are the resumes of the experienced individuals that would be assigned to this project.

Additional Services

Ulteig Engineers can provide additional services that currently fall outside the scope of this proposal as it is currently written. These services include but are not limited to: (1) construction observation services; (2) procurement of a geotechnical report for use in preparing the grading plan, foundation design, and substation ground grid; and (3) witness testing and design review meeting for the major equipment. These services can be provided at your request for an additional professional fee.

Project Management

Ulteig is dedicated to providing its clients with professional project management service. We ensure that the scope, schedule and cost of every project is closely managed and balanced so that our clients can realize the greatest value and efficiency found within the industry. Ulteig will provide the following project management activities throughout this project:

- a. Milestone schedule updates
- b. Deliverable status updates
- c. Request for Information logs
- d. Communications plan
- e. Technical meetings
- f. Project meetings

Quality Control

Ulteig implements a three-part strategy to control quality and quality assurance. The first part is to identify a project manager for every project. The project manager is responsible for overall project coordination and scheduling.

The second part utilizes Ulteig's diverse knowledge by assigning one engineer from each applicable discipline to all aspects to oversee the work of their responsible portion of the project.

Finally, before any project report is issued, a peer review is conducted to verify that company and industry standards were followed.

Proposal Work Plan

This proposal work plan identifies project deliverables along with specific assumptions and exclusions for each of the major areas of scope.

Substation

1. Conceptual Design

Deliverables

- a. General Arrangement
- b. M&R One-Line Diagram
- c. Lightning Protection

Assumptions

- a. Inter-utility coordination will be required to determine line relaying manufacture and type

Exclusions

- a. None

2. Specifications

Deliverables

- a. Equipment Specifications for CVT's, CT's, a 161kV breaker, 161kV group operated switches, circuit switcher, structural steel, concrete and site grading and preparation
- b. Construction Specifications
- c. Review vendor bid documents
- d. Review vendor submittals for major equipment as follows
 - i. CVT's
 - ii. CT's
 - iii. Breaker
 - iv. Circuit Switcher
 - v. Manually Operated Switches

Assumptions

- a. "Go by" specifications will be provided by RPU. Specifications will be reviewed and project specific information will be added or modified as necessary
- b. Existing group operated switch vendor drawings are available to use when evaluating the switch ratings

Exclusions

- a. Safety or lockout-tag out procedures for testing and checkout of the equipment
- b. Copies of equipment manuals, drawings and instructions are provided by the supplier

3. Protection and Controls

Deliverables

- a. Relay and Control Panel Arrangement

- i. Combined Line Relaying/Breaker Panel
 - ii. Update Bus Differential Panel with SEL relays
 - iii. Update/Modify mimic bus
 - iv. Install a SEL-2032
- b. Nameplate list
 - c. BOM
 - d. WD's
 - e. Front elevations
 - f. Allocated space provisions for a SMMPA SCADA panel
 - g. Probable choice of communication is fiber or power line carrier. Design will be provided for whichever is chosen.
 - h. AC/DC Auxiliary Service Study

Assumptions

- a. Approval of the M&R one-line must occur before relay control panel arrangement , nameplate list and bill of material can be completed
- b. Adequate space has been allocated for new relaying and control equipment in existing relay panels
- c. Existing wiring has been accurately documented to perform upgrades.
- d. The purpose of the AC and DC auxiliary service study is to verify the size of the substation battery, charger, DC panels, AC panels, and auxiliary transformers. Recommendations will be provided as to the outcome of the studies.

Exclusions

- a. Relay settings

4. Electrical Physical Design

Deliverables

- a. Final General Arrangement
- b. Sections, Elevations and Details
- c. Material List

Assumptions

- a. General arrangement must be approved before Sections, Elevations and Details can be completed
- b. No modifications to the control building enclosure will be required as existing equipment in place will be used.

Exclusions

- a. None

5. Conduit Routing Plan

Deliverables

- a. Modification of existing conduit plan and details
- b. Revised Conduit Schedule

Assumptions

- a. None

Exclusions

- a. None

6. Substation Grading

Deliverables

- a. Erosion and Sedimentation Control Plan
- b. Substation Grading Plan for the expansion of the substation yard.
- c. Interface between RPU and geo-tech firm to obtain design level soil boring information.

Assumptions

- a. A geotechnical report will be provided to Ulteig for use in preparing the grading plan, foundation design, and ground grids
- b. A topographic, legal and boundary survey of the substation parcel will be provided by others. Drawing NH13-P-003 will be provided in cad format for use in completing the site grading design
- c. Ulteig must receive the topographic survey and geotechnical report and have the general arrangement approved before the substation grading plan can be completed
- d. Ulteig will not perform any site surveying as a part of this proposal
- e. RPU staff is performing the initial wetland determination. Ulteig will not perform site wetland evaluations as a part of this proposal. Should wetland impacts be necessary, any work involved with that will be under a separate proposal.

Exclusions

- a. Any permits required to comply with federal, state or local requirements.
- b. Surveying and preparation of any necessary wetland replacement or mitigation exhibits.

7. Structural Steel

Deliverables

- a. Structural steel design and detailing of any new equipment stands (Dead End, CVT, CT, bus supports)

Assumptions

- a. If new switches are needed as part of this project, they will be installed on the existing switch stands.
- b. Sections, elevations and details must be approved before the structural steel design can be completed
- c. Review of manufacture circuit switcher stand in an attempt to re-use existing foundations.

Exclusions

- a. None

8. Foundations

Deliverables

- a. Foundation Plan
- b. Foundation Plan Details

Assumptions

- a. Standard drilled piers will be used for the dead end and low profile structures.
- b. Standard slabs on grade will be used for equipment foundations.
- c. Circuit switcher will require new foundation design and details.
- d. Ulteig will use the geotechnical data available from the original design of the substation and new geotechnical data for the expansion for foundation design.

Exclusions

- a. Design of any piles or non-traditional foundation design

9. Grounding

Deliverables

- a. Grounding Study
- b. Grounding Design

Assumptions

- a. The existing substation ground grid drawing NH13-P200 will be reviewed for conformance with IEEE Standard 80. Should it be deemed not in compliance, Ulteig will make recommendations and implement as necessary on the existing diagrams.
- b. Ulteig will use the geotechnical data available from the original design of the substation

Exclusions

- a. None

10. AC/DC Schematics

Deliverables

- a. AC/DC Schematics

Assumptions

- a. The panel elevations must be approved before the preliminary AC and DC schematics can be completed
- b. The vendor schematics must be supplied for major equipment (Breaker, CT, CVT, etc.) before the final AC and DC schematics can be completed

Exclusions

- a. None

11. Wiring Diagrams

Deliverables

- a. Panel to Panel Connection Diagrams
- b. Relay and control panel internal wiring diagrams will be prepared by Ulteig based on the RPU approved AC & DC schematics
- c. External Connection Design

Assumptions

- a. The AC and DC schematics must be approved and all panel wiring diagrams created by Ulteig must be approved before external connection diagrams, panel to panel wiring diagrams and SCADA RTU connection diagrams can be completed
- b. Existing equipment wiring diagrams are available and accurate per the current installation

Exclusions

- a. None

12. Power and Control Cables

Deliverables

- a. Power and Control Cable tabulation

Assumptions

- a. The AC/DC schematics must be approved before the control cable schedule can be completed

Exclusions

- a. None

13. Communications

Deliverables

- a. Communication Architecture drawing 920
- b. Coordinated design with XEL will be included to determine communication requirements on a conference call basis.

Assumptions

- a. Modifications will be made to accommodate the line addition.

Exclusions

- a. None

14. Scheduled Trips

Deliverables

- a. Site visits will be on an as requested basis.

Assumptions

- a. All construction site visits will be charged on a T&M basis.
- b. Design conferences will be via teleconference.
- c. Travel and construction coordination will be on an as requested basis.

Exclusions

- a. None

15. As-Builts

Deliverables

- a. As-Built Drawings

Assumptions

- a. Ulteig will be provided field marked copies of the construction prints and the most current cad drawings from RPU. Ulteig will make the changes and return the revised cad files, as well as the original field marks, within 30 days.

Exclusions

- a. None

The following are a list of *general assumptions* specific to the Substation work scope:

- a. Ulteig will participate in project meeting kick-off meeting at client site
- b. All final drawings will be stamped "For Construction" and certified by an Engineer licensed in the state of Minnesota.
- c. Ulteig project schedule assumes a two-week client review period on all deliverables
- d. Filing or procurement of any permit applications will be done by others
- e. Procurement of any topographic, legal and boundary surveys will be done by others
- f. Procurement of any geotechnical services and reports will be done by others
- g. Procurement of any materials will be done by others
- h. Delays caused by others due to lack of detailed information, lack of easement information, untimely review durations, delay or lack of permits etc., will result in a schedule and/or cost change order
- i. On-site project management or supervision will be done by others

Milestone Schedule

TBD

Professional Fees

The professional fee for our service is a time and materials not to exceed price of \$196,000.

* This fee is valid for 60 days.

Thank you for the opportunity to present this proposal. If you have any questions, please contact me at 701-306-8447 or by email at Michael.Kraft@Ulteig.com.

Sincerely,



Michael Kraft, PE
Lead Engineer
Protection & Controls



Troy Livgard, PE
Associate Vice President
Substation



RESOLUTION

BE IT RESOLVED by the Public Utility Board of the City of Rochester, Minnesota, to approve an engineering services agreement with Ulteig Engineers for

Northern Hills CapX Line Addition – Proposal for Engineering & Design

The amount of the agreement to be ONE HUNDRED NINETY-SIX THOUSAND AND 00/100 DOLLARS (\$196,000.00).

Passed by the Public Utility Board of the City of Rochester, Minnesota, this 28th day of February, 2012.

President

Secretary