

FOR BOARD ACTION

Agenda Item # 6.a.

Meeting Date: 7/31/07

SUBJECT: Engineering Services for Silver Lake Power Plant
Unit 4 Emissions Reduction Project
Change Order 002

REVISED
7-31-07

PREPARED BY: Wally Schlink, Director of Power Resources

ITEM DESCRIPTION:

The SLP Unit 4 boiler is designed to operate under positive pressure only and the new emission reduction system requires the installation of a booster fan to overcome draft losses. The booster fan has the potential of creating a negative pressure on the unit. Existing National Fire Protection Association (NFPA) guidelines when the project was developed allowed the potential negative pressure protection to consist of controls and "implosion" panels that would eliminate damage to the boiler structure. In 2007, a change in the NFPA guidelines requires that the boiler unit must be structurally capable of withstanding negative pressures which requires RPU to conduct a design study on the unit and develop a program to install additional structural changes to assure the boiler is capable of tolerating negative pressure excursions.

Due to the required structural expertise, long lead time for the study and the necessity to remain on schedule; staff requested that Utility Engineering Inc. take the lead in working with Babcock & Wilcox, the boiler original equipment manufacture, to complete the study.

At the June 2006 meeting, the Utility Board approved a contract for engineering services with Utility Engineering to provide the engineering, design, contract procurement support, construction management, site engineering, commissioning and start up work for the project. The original contract is for the amount of \$3,942,800 which included a firm bid amount of \$3,805,000 and covers 32,500 engineering man-hours for the project as well as expenses and sub-contracted studies that are required, plus additional services for owner's engineer activities totaling \$137,800 which was deducted from the Board approved contingency (The Board authorized a 15% contingency of \$570,750 which brought the total approved amount to \$4,375,750).

At the March 2007 Utility Board meeting, the Utility Board approved Change Order 001 for additional engineering services in the amount of \$265,000 which brought the total contract amount to \$4,207,800.

Staff requests that the Board approve Change Order 002 to the Utility Engineering contract for the amount of \$178,179 for the execution of the study.

Attached is a correspondence from Utility Engineering Inc., a proposal from Babcock & Wilcox and a matrix that breaks down the various additional activities.


General Manager

7/31/07
Date

ROCHESTER PUBLIC UTILITIES

FOR BOARD ACTION

Agenda Item # 6.a.

Meeting Date:

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Staff will be at the Board meeting to answer any questions on this request.

UTILITY BOARD ACTION REQUESTED:

Staff recommends that the Board request the Common Council approve Change Order 002 to the contract agreement with Utility Engineering for additional engineering services on the Silver Lake Power Plant Unit 4 Emissions Reduction Project. The amount of the change order is \$178,179 and will increase the total contract amount to \$4,385,919.

The 15% contingency will not be affected by this change. The total approved amount will be \$4,818,869.

General Manager

Date

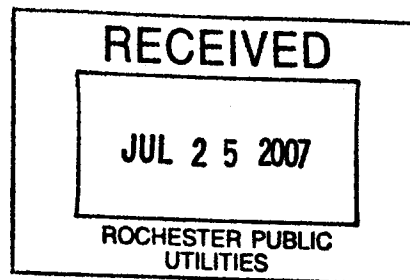
ROCHESTER PUBLIC UTILITIES



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July 24, 2007

Mr. Walter Schlink
Director of Power Production
Rochester Public Utilities
4000 East River Road NE
Rochester, MN 55906-2813



Subject: Silver Lake Plant Unit 4 Emissions Reduction Project
UE Project No. 012668
Change Order Request - Utility Engineering Corporation Contract

Dear Mr. Schlink:

This letter is to request a change order to the UE contract for \$178,179.

As you know, in June, 2007, UE retained Babcock & Wilcox (B&W) to perform a study of the Silver Lake Unit 4 boiler to determine its capability to withstand negative pressure and identify any structural modifications necessary to allow the boiler to handle such pressure. UE determined that boiler structural modifications are necessary for the following reasons:

1. The new scrubber baghouse system will include a booster fan. Under "worst case" conditions, it is conceivable that the boiler could experience negative pressure.
2. Due to recent changes to the NFPA code, the boiler must be structurally capable of handling such pressures. Reliance on implosion panels and controls no longer meets the most recent code that was issued December, 2006.
3. B&W, (original equipment manufacturer) is in the best position to do this work, since they have original (proprietary) detail drawings and calculations.

We have attached the B&W proposal for \$152,650, and the related UE change of scope sheet. Item 17 on the UE sheet is for the B&W study scope. Item 15 is for UE support of that study for \$25,529, for a total of \$178,179. UE anticipates this work will be completed by November 1, 2007.

Sincerely,

A handwritten signature in black ink that reads 'Roger B. Anderson'.

Roger B. Anderson, P.E.
Senior Project Manager

RBA/dlk

Enclosure



The Babcock & Wilcox Company

a McDermott company

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April 19, 2007

Mr. Dan Carlson, P.E.
Utility Engineering
901 Marquette Ave, Suite 2900
Minneapolis, MN 55402

Ref: Rochester Public Utilities Silver Lake Unit #4
B&W Boiler Reference S-10209
Proposal P-008127

Subj: Proposal – Negative Pressure Engineering Study

Dear Mr. Carlson:

Per your request to Keith Latendresse, The Babcock & Wilcox Company is pleased to present the following proposal to conduct an engineering study to determine what modifications must be performed on specific components of Rochester Public Utilities Silver Lake Unit #4 (B&W boiler contract S-10209) in order to allow it to safely operate with an induced draft fan installed.

The subject boiler is a pressure-fired unit, designed to operate under positive pressure only, and was originally only equipped with a forced draft fan. However, as part of the installation of new emissions reduction equipment, a new induced draft fan is being installed on the unit (by others). While it is our understanding that the purpose of the new fan is simply to overcome the additional system loss attributable to the new back end equipment and that the unit will still be operated as a pressure-fired unit, per NFPA guidelines, the unit must be capable of withstanding negative pressures.

The differences in a boiler designed for positive pressure only versus one designed for both positive and negative pressure can be significant and can affect many of its components. Typically, these differences can include how buckstays are tied to furnace walls, how buckstay end connections are designed to allow compression loading, the design and spacing of stiffeners in casing, flues and ducts, etc. Engineering calculations for this type of work are extensive and very labor-intensive due to the great deal of review that must be performed and most of these calculations must be done by hand. Each area covered must be recalculated for current design stress capabilities in light of revised strengths of materials in today's standards versus those in effect during the original design of the unit.

The proposed study will investigate and determine the required modifications to the components that were included in B&W's original scope of supply. This includes:

- Buckstay modifications
- Arch and superheater floor modifications
- Furnace hopper/floor/dead air space support and stiffener modifications

- Furnace roof / penthouse floor support and stiffening
- Penthouse casing design modifications
- Generating bank stiffener modifications
- Windbox design modifications including casing, internal trusses and wall attachments
- Modifications to the wraparound ducts to the windbox
- Economizer casing modifications
- Economizer hopper modifications
- Changes to boiler loads, ties and supports
- Changes in top steel design (for top steel originally supplied by B&W)

The following areas are not included in B&W proposed scope of supply for determining any required modifications:

- All equipment shown on Clyde Bergemann drawing D2, sheets 1 and 2.
- All flues downstream of the economizer hopper outlet
- Ljungstrom Air Heater
- All secondary air ductwork except for the wraparound ducts to the windbox and the windbox proper
- All primary air ductwork
- Top steel not originally supplied by B&W
- Any controls or instrumentation

In order to determine the required modification to the areas outlined above, the new design pressure requirements must be established. In conjunction with design information to be supplied by Utility Engineering related to the new ID fan, SDA, baghouse and connecting flues, B&W Applications Engineering will determine the required design pressure for all components, including those not part of the original B&W scope of supply. B&W will determine the required design pressure for both the existing equipment and the new equipment shown on Clyde Bergemann drawing D2, sheets 1 and 2.

The deliverable for the proposed study will be a report outlining the new required design pressures for all areas of the unit and a general overview of the recommendations for modifying the areas that were in B&W original scope (as detailed above). The report may include sketches as required for clarity, but will not include arrangement or detailed drawings, bills of materials, etc. for the modifications. Shortly after submission of the report, a firm price proposal for the required graphics and material to implement the recommended modifications will be

submitted by B&W. This proposal cannot be put together until the results of the study are known.

In order to begin work on this study, design information for the new ID fan, SDA and baghouse must be provided. This information must include a fan curve and gas side pressure loss predictions under design loads for the SDA and baghouse.

The Babcock & Wilcox Company offers to provide the engineering study scope of supply, as outlined above, for the firm price of \$152,650 (ONE HUNDRED FIFTY TWO THOUSAND SIX HUNDRED FIFTY DOLLARS). Based on current engineering backlog, the estimated lead-time for delivery of the Study report is 18 to 20 weeks after receipt of an order.

This offer is subject to the attached Terms and Conditions. This offer is valid for sixty days from the date of this proposal.

If you have any questions regarding this proposal, please do not hesitate to contact us.

Sincerely yours,
THE BABCOCK & WILCOX COMPANY

Michael Vanco, Jr.
Principal Engineer
Midwest Field Service

c: DB Pearson – B&W Midwest Service
LM Polster - B&W Midwest Service
KJ Latendresse – B&W Sales

Utility Engineering Corporation

RPU SLP4 Emission Reduction Project Additional Scope Items

16-Jul-07

RPU - UE CO #2 Items not yet approved

Item #	Additional Scope Item	% Complete	Hours to date	Billings to Date	Est. Future Hours	Estimated Future Billings	Total Estimated Hours	Total Estimated Billings	Authorized Amount	Est. Total Project Cost Added	Comments
15	Boiler Implosion Study	30%	67.5	\$9,059	110	\$16,470	177.5	\$25,529		see below	Study support only, not design support
17	Boiler Implosion Study - B&W Charge	5%	0	\$0	0	\$152,650	0	\$152,650		\$2,000,000	B&W Proposal
TOTAL			67.5	\$9,059.40	110	\$169,120	177.5	\$178,179	\$0	\$2,000,000	

OK



RESOLUTION

BE IT RESOLVED by the Public Utility Board of the City of Rochester, Minnesota, that the Common Council of the said City is requested to approve Change Order 002 to the contract agreement with Utility Engineering for additional engineering services on the Silver Lake Power Plant Unit 4 Emissions Reduction Project. The amount of the change order is \$178,179 and will increase the total contract amount to \$4,385,919. The 15% contingency will not be affected by this change. The total approved amount will be \$4,818,869.

Passed by the Public Utility Board of the City of Rochester, Minnesota, this 31st day of July, 2007.

President

Secretary