FOR BOARD ACTION

Agenda Item # 4.b. **Meeting Date:** 6/26/07

SUBJECT: Emissions Reduction Project
Approval to Purchase NOx Emission Control System

PREPARED BY: Wally Schlink, Director of Power Resources

ITEM DESCRIPTION:

The Emission Reduction Project (ERP) continues to proceed according to the project schedule. The Utility Board has previously approved the preliminary project plan, the contract for Engineering Services, the purchase of the Scrubber / Baghouse equipment, the Ash Handling and Storage System, the power distribution center and the formal authorization and financing program for the project.

Staff in now prepared to request approval for purchase of the NOx Emission Control System. The NOx system specification was required to provide reduction in the NOx emission rate levels from our current level of .40 Lb MMBtu to the levels committed to in the Settlement Agreement with MCEA and MPCA of .15 Lb/MMBtu. This level is also the target emission level identified in the Clean Air Interstate Rule (CAIR) Phase I NOx cap and trade program.

Through our engineers, Utility Engineering (UE), a specification was distributed to 12 suppliers and we received bid packages from 3 bidders. The bid package had specified that the bids would be evaluated on a life cycle cost basis and defined the evaluation criteria that would be used. UE performed the evaluation and has issued a Recommendation to Purchase and a Bid Comparison matrix, both of which are attached.

In addition to optimizing the life cycle costs, the bidding process was conducted in a manner to meet the requirements of the Settlement Agreement with the Minnesota Pollution Control Agency and the Minnesota Center for Environmental Advocacy. The Settlement Agreement states the system shall be "designed to achieve a NOx emission rate of .15 Lb/MMBtu or less" Based on their analysis our engineer, UE, has issued a professional opinion that the most cost effective systems do not meet the "design to achieve" requirement nor the required performance guarantees and therefore do not comply with the RFB requirement that the system be designed to achieve an Nitrogen Oxide Emissions Rate of .15 Lb/MMBtu and should be rejected

The proposed contract price exceeds the project estimate but is the only system that will comply with the requirements of the Request for Bid, our Settlement Agreement obligations and future CAIR compliance levels. This is an approved project in the 2007 capital budget.

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

Larry Koshire
General Manager

6/21/07
Date

ROCHESTER PUBLIC UTILITIES

FOR BOARD ACTION

Agenda Item # 4.b. **Meeting Date:** 6/26/07

UTILITY BOARD ACTION REQUESTED:

Staff recommends that the Board reject the 3 bids from Advanced Combustion Technology Inc., Burns and McDonnell and the MobotecUSA alternative bid as non-compliant with the terms of the RFB and approve the purchase and request that the Mayor execute the contract for the supply of the NOx Emissions Control System per the bid specification from MobotecUSA identified as the base bid for a firm lump sum price of $4,049,208.

General Manager Date

ROCHESTER PUBLIC UTILITIES

UTILITY ENGINEERING

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June 19, 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
Recommendation to Purchase NOx Emissions Control System from Mobotec

Dear Mr. Schlink:

Utility Engineering Corporation (UE) recommends the purchase of the NOx emissions system from MobotecUSA (Mobotec) for the scope of equipment per their May 31, 2007 base bid.

Proposals for the NOx emissions control system were received from Advanced Combustion Technology, Inc. (ACT) and Burns & McDonnell (BMcD).

Bidding Process

On April 24, 2007, a Request for Bid (RFB) for a NOx emissions control system was issued to the following 10 suppliers:

Advanced Burner Technologies, Corp.
Advanced Combustion Technology, Inc.
Babcock Power Environmental Inc.
Burns & McDonnell
Combustion Solutions, Inc.
Energy Systems Associates, Inc.
Foster Wheeler
Fuel Tech, Inc.
MobotecUSA
Peerless Manufacturing

The bid specifications were prepared to allow for alternatives and options that would result in the best overall value to the City. The bidders were advised in the bid documents that the determination of best overall value would be based not only on equipment costs, but would also include life cycle operating costs.

Pre-Bid meetings were conducted on May 1, 2007 and on May 15, 2007. Prior to the second pre-bid meeting, two (2) additional suppliers, Babcock & Wilcox and Sure Alloy Steel requested and were issued copies of the RFB.

As previously stated, bids were received from ACT, BMcD and Mobotec. A brief description of each bid and its evaluation is provided as follows:

Advanced Combustion Technology, Inc. (ACT)

The Base Bid from ACT was in the amount of $1,545,000. Options for new low NOx burners, an over fire booster fan, pulverizer static classifiers and coal flow monitoring were proposed for a total price of $524,000. As the ACT NOx emissions guarantee was contingent upon the purchase of the static classifiers and UE believes the other options are required for satisfactory system performance, the basis for UE's evaluation was $1,545,000 plus $524,000 or $2,069,000. Initially, ACT guaranteed a NOx emissions rate of 0.15 Lb/MMBtu subject to their exception to the City's LDs. ACT was then requested to provide a guaranteed emissions rate that would be subject to the City's LDs and responded with a guaranteed emissions rate of 0.185 Lb/MMBtu.

BMcD

The BMcD Base Bid amount was $2,187,000 for a non-boosted over fire air (OFA) system and a selective non-catalytic reduction system (SNCR). Performance test cost (originally omitted from the BMcD base bid), the costs for coal flow monitoring and flow model options were added to the BMcD base bid to arrive at a total equipment cost of $2,521,750. BMcD, likewise, initially guaranteed a NOx emissions rate of 0.15 Lb/MMBtu subject to their exception to the City's LDs as well as their exception to the City's limit for ammonia slip. The BMcD proposal included a caveat that the operating conditions (higher ammonia slip) that will be required to meet the 0.15 Lb/MMBtu emissions rate will also cause plugging of the air heater. BMcD was also requested to provide a guaranteed emissions rate for which they would accept the City's LDs without exceeding the specified levels of ammonia slip. The BMcD response was a 0.19 Lb/MMBtu emissions guarantee and an increase in bid price of $176,000 to cover their risks associated with the City's LDs.

Mobotec Base Bid

The Mobotec Base Bid price was $3,999,208 for a boosted OFA system and an SNCR. As the Mobotec technology is vastly different than conventional NOx control technologies and relies heavily upon its high energy OFA system called ROFA, low NOx burners or pulverizer upgrades are not required for acceptable NOx emissions rates. No options were offered in the Mobotec proposal and their proposal did not take exception to the City's LDs.

Mobotec Alternative Bid

As Mobotec has on several occasions furnished stand alone ROFA-only systems for NOx control, UE evaluated their ROFA system by deleting the cost of the Rotamix based on the line-item pricing of $975,000. Mobotec was requested to guarantee NOx emissions for a ROFA-only system and a NOx emission rate of 0.21 Lb/MMBtu was proposed.

Bid Recommendation

Based on a life cycle cost analysis that included installed system costs, system operating costs and the cost to purchase NOx emissions credits for anticipated NOx emissions rates exceeding 0.15 Lb/MMBtu on an average annual basis, it was determined that the alternative Mobotec system is the most cost-effective. Using evaluation factors provided in the RFB, the alternative Mobotec bid has a net present value life cycle cost savings of $0.9 Million vs. the ACT system.

In addition to optimizing life cycle costs, the bidding process for the NOx emissions control system was also conducted in a manner to ensure the installed emissions control system will meet the requirements of the Settlement Agreement with the Minnesota Pollution Control Agency and the Minnesota Center for Environmental Advocacy. The Settlement Agreement states the system shall be "designed to achieve a NOx emissions rate of 0.15 Lb/MMBtu or less." Based on our analysis, UE believes that the cost-effective alternative Mobotec system and the ACT and BMcD systems will not meet the "designed to achieve" requirement specified in the RFB. For this reason, UE recommends the award of a purchase order to Mobotec for the equipment included in their base bid. The Mobotec base bid is fully compliant with the RFB; the proposal guarantees the level of NOx emissions reductions the City is seeking, while agreeing to accept the significant liquidated damages requested by the City for not meeting specified performance.

While the Mobotec base bid price significantly exceeds the UE estimate of $2,575,000 for the NOx control system, the Mobotec system offers several operational benefits in addition to those included in our bid analysis. These advantages are as follows:

- No net increase in emissions of carbon monoxide; could expedite the permitting process.
- Flexibility to reduce boiler excess air that will improve boiler efficiency and reduce fuel costs.
- High level of confidence that NOx emissions comply with the intent of the Settlement Agreement and there will be no need to purchase NOx credits before 2015.
- No need to modify the existing pulverizers with static classifiers that could raise questions by regulators regarding an increase in coal firing capability
- Reduced potential for plugging of the air heater by ammonium sulfates as Mobotec has guaranteed a low level of ammonia slip and their system is less reliant upon the use of SNCR to achieve the required NOx emissions levels than their competitors' systems.

Recommended Contract Price

Based on Mobotec's Base Bid price of $3,999,208, that includes a $100,000 contingency and the cost of the Performance Bond of $50,000, UE recommends the issuance of a purchase order to Mobotec for a firm lump-sum price of $4,049,208 for a NOx emissions control system for the Silver Lake Plant Unit 4 Emissions Reduction Project. To ensure the timely completion of vendor engineering prior to the receipt of bids for mechanical construction, UE also recommends a purchase order agreement for the NOx emissions control system be executed by July 23, 2007.

Sincerely,

Luther M. Raatikka, P.E.
Senior Design Consultant, Mechanical

LMR/dlk

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Rochester Public Utilities – Silver Lake Plant Unit 4
NOx Emissions Control System Bid Comparison

Line No.	BASE BID DESCRIPTION	Advanced Combustion Technology, Inc.	Burns & McDonnell	ROFA+Rotamix MobotecUSA	ROFA Only MobotecUSA
001	Low NOx Burner System:				
001a	Low NOx Burners	$ 185,000	N/A	N/A	N/A
001b	Air Flow Monitoring	Incl.	N/A	N/A	N/A
001c	Coal Flow Monitoring	Option 014	Option 014	N/A	N/A
001d	Boiler Panels	$ -	N/A	N/A	N/A
001	Total - Low NOx Burner System	$ 185,000	$ -	N/A	N/A
002	Over Fire Air System:	$ 375,000	$ 395,000		
002a	Ductwork & Expansion Joints:	Incl.	Incl.	$ 1,680,000	$ 1,680,000
002b	Booster Fan(s)	Option 013	N/A	$ 420,000	$ 420,000
002c	Secondary Air Dampers	Incl.	Incl.	$ 165,000	$ 165,000
002d	Air Flow Monitoring	Incl.	Incl.	$ 15,000	$ 15,000
002e	Boiler Panels	Incl.	Incl.	$ 85,000	$ 85,000
002	Total - Over Fire Air System	$ 375,000	$ 395,000	$ 2,365,000	$ 2,365,000
003	Selective Non-Catalytic Reduction (SNCR)	$ 750,000	$ 1,500,000	$ 975,000	$ -
004	Flow Model Testing	Incl.	Option 015A	$ 95,000	$ 95,000
005	Supplier Engineering	Incl.	$ 150,000	$ 405,000	$ 405,000
006	Field Support - (Const/Startup/Training)	Incl.	$ 355,000	Incl.	Incl.
007	Freight	Incl.	Incl.	Incl.	Incl.
008	Taxes	$ -	$ -	Incl.	Incl.
009a	Other (Define) Performance Testing	$ 135,000	Incl.		
009b	Other (Define) Controls			$ 59,208	$ 59,208
010	Contingency Amount	$ 100,000	$ 100,000	$ 100,000	$ 100,000
011	**TOTAL FIRM LUMP SUM PRICE - BASE BID**	**$ 1,545,000**	**$ 2,500,000**	**$ 3,999,208**	**$ 3,024,208**

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Rochester Public Utilities – Silver Lake Plant Unit 4
NOx Emissions Control System Bid Comparison

Line No.	OPTIONAL BID DESCRIPTION	Advanced Combustion Technology, Inc.	Burns & McDonnell	ROFA+Rotamix MobotecUSA	ROFA Only MobotecUSA
012	Ultra Low NOx Burners	$ 150,000	N/A	N/A	N/A
013	Overfire Air Booster Fan	$ 65,000	N/A	N/A	N/A
014	Coal Flow Monitoring	$ 59,500	$ 149,750	N/A	N/A
015	Pulverizer Upgrades - Static Classifiers	$ 249,500	N/A	N/A	N/A
016	Flow Model Testing	N/A	$ 50,000	N/A	N/A
017	**FIRM LUMP SUM PRICE - OPTIONS ONLY**	**$ 524,000**	**$ 199,750**	**N/A**	**N/A**
018	**FIRM LUMP PRICE - BASE BID + OPTIONS**	**$ 2,069,000**	**$ 2,699,750**	**$ 3,999,208**	**$ 3,024,208**
	CONSTRUCTION COSTS COMPARISON				
019	Burner Installation	$ 90,000	$ -	$ -	$ -
020	Static Classifier Installation	$ 120,000	$ -	$ -	$ -
021	Overfire Air Ductwork Installation	$ 150,000	$ 150,000	$ 450,000	$ 450,000
022	Overfire Air Fan Installation	$ 150,000	$ -	$ 650,000	$ 650,000
023	SNCR Installation	$ 400,000	$ 480,000	$ 400,000	$ -
024	**TOTAL CONSTRUCTION COSTS**	**$ 910,000**	**$ 630,000**	**$ 1,500,000**	**$ 1,100,000**
025	**TOTAL INSTALLED COSTS**	**$ 2,979,000**	**$ 3,329,750**	**$ 5,499,208**	**$ 4,124,208**
	PERFORMANCE & OPERATING COSTS COMPARISON				
026	Guaranteed NOx Emissions Rate	0.185	0.19	0.15	0.21
027	Bonus/Penalty - Cost of NOx Credits	$ 1,172,500	$ 1,340,000	$ -	$ 2,010,000
028	Guaranteed Urea Consumption Rate - Lb/Hr	144	180	130	0
029	Bonus/Penalty for +/- 144 Lb/Hr	$ -	$ 1,000,000	$ (388,889)	$ (4,000,000)
030	Guaranteed Auxiliary Power Usage - KW	165	70	596	526
031	Bonus/Penalty for +/- 200 KW	$ (140,000)	$ (520,000)	$ 1,188,000	$ 978,000
032	**PERFORMANCE & OPERATING COSTS COMPARISON**	**$ 1,032,500**	**$ 1,820,000**	**$ 799,111**	**$ (1,012,000)**

UTILITY ENGINEERING

Rochester Public Utilities – Silver Lake Plant Unit 4
NOx Emissions Control System Bid Comparison

Line No.	TOTAL EVALUATED BID PRICE	Advanced Combustion Technology, Inc.	Burns & McDonnell	ROFA+Rotamix MobotecUSA	ROFA Only MobotecUSA
033	TOTAL FIRM LUMP SUM PRICE BASE BID + OPTIONS	$ 2,069,000	$ 2,699,750	$ 3,999,208	$ 3,024,208
034	TOTAL CONSTRUCTION COSTS	$ 910,000	$ 630,000	$ 1,500,000	$ 1,100,000
035	TOTAL INSTALLED COSTS	$ 2,979,000	$ 3,329,750	$ 5,499,208	$ 4,124,208
036	PERFORMANCE & OPERATING COSTS COMPARISON	$ 1,032,500	$ 1,820,000	$ 799,111	$ (1,012,000)
037	**TOTAL EVALUATED BID PRICE**	**$ 4,011,500**	**$ 5,149,750**	**$ 6,298,319**	**$ 3,112,208**
038	**DIFFERENTIAL**	**$ 899,292**	**$ 2,037,542**	**$ 3,186,111**	**BASE**

UTILITY ENGINEERING

Rochester Public Utilities – Silver Lake Plant Unit 4
Addendum
NOx Emissions Control System Bid Comparison

In addition to the items identified in the PERFORMANCE & OPERATING COSTS COMPARISON, the NOx control system offered by Mobotec proposal provides additional benefits as follows that may add value to the emissions reduction project.

Other Potential Benefits of Mobotec Systems	**ROFA & Rotamix**	**ROFA Only**
Minimize or Eliminate the Need for NOx Credits after Jan. 1, 2015 when CAIR NOx emissions rate will be revised from 0.15 Lb/MMBtu to 0.125 Lb/MMBtu for SLP4.	$ 540,000	$ -
Settlement Agreement - Possible Litigation if NOx Emissions are Significantly Above 0.15 Lb/MMBtu	$ 500,000	$ -
Improved Reliability Due to Reduced Ammonia Slip - Prevents Fouling of Air Heater	$ 400,000	$ 400,000
Improved Boiler Efficiency - 1% Improvement	$ 1,600,000	$ 1,600,000
Reduced Lime Consumption Due to Additional Residence Time in SDA (5% @ $65,000/1%)	$ 325,000	$ 325,000
Opportunity to use MinPlus for Mercury.	$ -	$ -
Easier Permittting Process Due to No Increase in CO and Low Level of Ammonia Slip	$ -	$ -
NPV of Other Potential Benefits Associated with Mobotec Systems	**$ 3,365,000**	**$ 2,325,000**

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RESOLUTION

BE IT RESOLVED by the Public Utility Board of the City of Rochester, Minnesota, to reject the bids from Advanced Combustion Technology Inc., Burns and McDonnell and the alternative bid from MobotecUSA as non-compliant with the terms of the bid specification.

BE IT FURTHER RESOLVED that the Board approves a contract agreement with MobotecUSA and requests that the Mayor and City Clerk execute the contract for

Purchase of NOx Emission Control System
Emission Reductions Product

The amount of the contract agreement to be FOUR MILLION FORTY-NINE THOUSAND TWO HUNDRED EIGHT AND 00/100 DOLLARS ($4,049,208.00) and MobotecUSA being lowest responsible bidder.

Passed by the Public Utility Board of the City of Rochester, Minnesota, this 26th day of June, 2007.

_____
President

_____
Secretary