

COUNCIL ACTION FORM

SUBJECT: POWER PLANT STEAM TURBINE NO. 8 OVERHAUL

BACKGROUND:

On September 25, 2012, City Council approved preliminary plans and specifications for the Steam Turbine No. 8 Overhaul. This unit is scheduled to be disassembled and inspected after over 27,000 hours of operation during the spring 2013 outage. This work is required to replace worn parts and inspect the turbine and generator for repairs that may be needed to avoid more serious damage. Repairs and replacement of worn parts will be completed as the inspection progresses. Experience has shown that certain parts require replacement every outage and some parts become unusable during the disassembly process. Also worn sections and cracks found during the inspection require various types of weld repairs.

On October 9, 2012, City Council approved the procurement of the steam turbine parts required for this project. The parts have been, and continue to be, delivered to the Power Plant, at a cost of \$526,086.90 (inclusive of IA sales-tax) plus freight to be paid by the City.

This portion of the project is for the procurement of an experienced turbine contractor to perform all the disassembly, cleaning, repairing and reassembly of Unit 8 Turbine Generator.

In order to avoid the similar problems experienced the last time Unit 7 was overhauled, staff intended to: 1) give greater emphasis on a company's proven expertise when evaluating preferred bidder; 2) gain a tighter control on costs by requiring bids for optional work should it be identified once the unit is opened; and 3) dedicate a staff engineer to oversee the project.

Bid documents were issued to sixty-three potential bidders. The bid was advertised on the Current Bid Opportunities section of the Purchasing webpage and a Legal Notice was published in the Ames Tribune. The bid was also sent to three plan rooms.

In addition to the Base Bid, (which consists of turbine disassembly; inspection; cleaning; turbine generator reassembly; valves, auxiliaries, turbine rotor and component shipping to repair facility; and the completion of minor repairs on all components), the bid contains fourteen options based on time and material not to exceed prices for major repair work that may be necessary once the unit is opened up. The purpose of the option bids was to limit costs for the City and pay actual costs for the repair since the scope of each repair could not be defined for a lump sum bid. However, most of the bidders qualified their not-to-exceed option

prices with a labor hour limitation as they were not willing to accept risk for an unknown repair scope. They bid based on their experience with completing this type of work but were not willing to accept risk for the possibility of more extensive damage and more extensive required repairs.

On October 31, 2012, eleven bids were received as shown on “**Attach C - Bid Summary**” on the attached Bid Report.

Council may recall from the November 13, 2012, meeting when bids were reported that staff determined that the bid submitted by Turbocare was found to be non-responsive because bid security was not submitted with its bid.

As a result, ten bids remained for Electric Services staff to evaluate. **After the further evaluation of the remaining bids staff determined that the bid submitted by Power Plant Field Services was also non-responsive due to exceptions they took to critical technical components of the specification.** The exceptions are as followed: 1) they will not supply any cribbing, floor protection and scaffolding; 2) shifted responsibility for freight and shipping from them to the City; 3) placed hour limitations for main steam valve and control valve work; 3) required the City to have all new cam bushings and bearings; 4) all cutting of bolts was considered extra work; and 5) required the City to supply a mobile crane if needed.

Staff selected the options they anticipate utilizing and added the Base Bid to determine the winner as shown on “**Attach B – Award Evaluation.**” It is important to note that “**Attach A – Summary**” shows a summary of the key components derived from evaluation conducted on “**Attach B**”.

Based on the Base Bid and the summation of all options selected for award, staff concluded that the apparent low bid submitted by NAES Corporation, Houston, TX, in the amount of \$807,800 (inclusive of applicable Iowa sales tax) is acceptable. This price consists of the lump sum portion, not-to-exceed portion and time and materials qualified portion. Council should note NAES did not supply a not-to-exceed time and material price for Option 7 which staff selected. As a result, staff estimated a cost for evaluation purposes of \$130,000 based on the other bids and past staff experience.

The engineer’s estimate to perform the overhaul work with the present work scope required and a reasonable amount of repair is \$1,830,000. The approved FY 2012/13 Budget and Capital Improvements Plan includes \$3,500,000 for the turbine generator overhaul including parts, professional technical assistance, and contractor services. As mentioned earlier the parts were awarded in the amount of \$526,086.90 (inclusive of IA sales-tax) plus freight. The City will reimburse the contractor for actual delivery costs. The engineer’s estimate for the parts portion was \$533,000. The approved FY 2012/13 Budget includes \$2,000,000 for parts in the Unit #8 Blading and Diaphragm/Parts project associated with the Unit #8 Turbine Generator Overhaul. The entire overhaul project scope has changed considerably since the amounts above were

budgeted. Initially a large number of blades and stationary steam path components were planned for replacement. Staff decided to make one more repair on the components before replacing during the next outage. As a result the overhaul estimate is much less than budgeted.

Council should note that professional technical service is utilized during major turbine generator work to provide instructions and advice on disassembly and reassembly, parts replacement and repair procedures. This year due to the significant repairs anticipated and value of parts procured, staff believes it will be very beneficial to procure the professional technical assistance from General Electric International, Inc. (GE) who is the Steam Turbine No. 8 manufacturer and parts supplier. The cost-not-to-exceed estimate will be \$256,870.00. GE's proposal is currently being reviewed by the City's Legal Department to identify any terms and conditions that could pose a risk to the City. **This will be presented to City Council for consideration at a future meeting.**

To date, the project budget has the following items encumbered:

1.	\$526,086.90*	Actual cost for Unit #8 Steam Turbine Parts. *Council should not this total does not include freight. The City will reimburse the contractor for actual delivery costs.
2.	\$807,800.00	Actual cost of Base Bid, plus cost-not-to-exceed Options for Steam Turbine No. 8 Overhaul. (this item)
3.	\$256,870.00	A cost-not-to-exceed for GE representative to provide technical direction for this overhaul. (will be presented to City Council for consideration at a future meeting)
Total \$1,590,756.90		

Work on this project would begin during the 2013 spring outage which is scheduled to start April 1, 2013.

ALTERNATIVES:

1. Award a contract to NAES Corporation, Houston, TX, for the Steam Turbine No. 8 Overhaul in the amount of \$807,800.00.

This amount consists of:

- \$443,800 for the lump sum base bid contract portion.
- \$91,500 for the time and material based "not to exceed" contract portion.
- \$272,500 for the estimated time and material based contract portion.

2. Reject all bids and cancel the Unit 8 Turbine overhaul.

MANAGER'S RECOMMENDED ACTION:

The Unit 8 Turbine-Generator is scheduled for a major overhaul starting in the spring of 2013. Turbine-generator overhauls are typically performed in the industry about every five years to restore unit efficiency and to maintain good unit life and reliability. Without this overhaul, the Power Plant's performance would degrade considerably over time and the risk of catastrophic failure will increase. Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1 as stated above.



INVITATION TO BID NO. 2013-037 STEAM TURBINE NO. 8 OVERHAUL SUMMARY

[illegible]


Council should note the following:

HPI, Turbine Pros and Wood Group's "Option" bids are based on a pricing range depending on whether the work is conducted "on-site" or "off-site".

* Evaluated Base and Total are less all applicable sales tax since five of the bidders are not licensed to collect.

****NAES bid "time & materials" for Option #7. Based on typical work performed and other bid's submitted from the other bidder's Electric Services' staff estimates total "time & materials not-to-exceed" with NAES to be \$130,000.**

***Council should note that the all the responsive bidders (except for Mitsubishi Power Systems and Wood Group) in this column qualified most of the "not-to-exceed" pricing. They qualified based on assumptions of typical work conducted in a turbine overhaul and limited the manhours. The "Qualified" work items are actually time & material work items. For example: On Option 1 NAES based their \$15,000 "not-to-exceed" price on 100 man hours. If the man hours exceeds 100 then the price would change.

	INVITATION TO BID NO. 2013-037 STEAM TURBINE NO. 8 OVERHAUL AWARD EVALUATION										
BIDDER:	NAES Corporation Houston, TX	HPI-LLC Houston, TX	Turbine Pros Rogers, MN	Power Generation Service, Inc Anoka, MN	Turbine Diagnostic Services Odessa, FL	General Electric Intl Inc Omaha, NE	Wood Group Power Plant Services, Inc., Alpharetta, GA	Mitsubishi Power Systems Americas, Inc. Orlando, FL	Midwest Service Center, Hobart, IN	Turbocare Chicopee, MA	Power Plant Field Services Ball Ground, GA
BASE	\$443,800.00	\$445,160.00	\$490,480.00	\$541,492.00	\$629,438.00	\$643,129.00	\$773,593.51	\$863,907.00	\$885,470.00	Non-Responsive.	Non-Responsive.
IA Sales Taxes included in the above Amount:	\$29,050.00	\$29,122.45	Not included	\$37,905.00	Not licensed to collect IA sales tax	Not included	\$54,151.55	Not included	Not licensed to collect IA sales tax		
Evaluated Base (less all taxes)	\$414,750.00	\$416,037.55	\$490,480.00	\$503,587.00	\$629,438.00	\$643,129.00	\$719,441.96	\$863,907.00	\$885,470.00		


SELECTED NOT-TO-EXCEED PRICE OPTIONS*											
12	Repowering and boring of four main shaft journal bearings. Include shipping if necessary.	\$54,000.00	\$19,970.00	\$42,200.00	on-site	\$19,313.00	\$24,282.00	\$55,941.00	\$43,326.88	\$6,021.00	\$43,330.00
				\$25,200.00	off-site						
13	Inspection and testing the generator	\$16,500.00	\$16,120.00	\$20,370.00		\$15,100.00	\$22,500.00	\$24,109.00	\$19,731.06	\$55,015.00	\$20,944.00
14	Turbine rotor low speed spin balance	\$21,000.00	\$17,890.00	\$17,200.00	on-site	\$8,755.00	\$21,122.00	\$7,885.00	\$18,933.85	\$14,750.00	\$10,048.00
				\$15,200.00	off-site						
SUB-TOTAL:		\$91,500.00	\$53,980.00	\$60,700 - \$79,700		\$43,168.00	\$67,904.00	\$87,935.00	\$81,991.79	\$75,786.00	\$74,322.00
*Council should note that this section consists of actual "time and material not-to-exceed" prices. Also, Turbine Pros bid is based on a pricing range depending on whether the work is conducted "on-site" or "off-site".											

SELECTED "QUALIFIED" NOT-TO-EXCEED PRICE OPTIONS**																		
1	Major repair of first stage nozzle parts	\$15,000.00	\$18,250.00		\$14,500.00		\$28,428.00		\$97,836.00		\$14,743.00		\$18,061.69		\$79,753.00		\$36,995.00	
2	Major repair of first stage deflector	\$7,500.00	\$18,250.00		\$14,500.00		\$3,605.00		\$24,221.00		\$4,775.00		\$18,061.69		\$34,776.00		\$23,061.00	
3	Major repair of both rows of first stage rotating blades	\$15,000.00	\$21,650.00		\$17,200.00		\$3,605.00		\$29,436.00		\$9,550.00		\$21,425.14		\$17,069.00		\$26,570.00	
4	Major repair of second thru fifth stage blades	\$30,000.00	\$54,130.00		\$43,000.00		\$7,416.00		\$84,721.00		\$19,100.00		\$53,562.86		\$34,139.00	Minor Repair		\$60,731.00
5	Major repair of second thru fifth stage diaphragms	\$30,000.00	\$77,540.00		\$61,600.00		\$62,830.00		\$264,581.00		\$60,910.00		\$76,731.91		\$419.00	each blade		\$53,660.00
6	Major repair of 14 th thru 17 th stage diaphragms	\$30,000.00	\$74,540.00		\$61,600.00		\$77,250.00		\$317,492.00		\$294,833.00		\$76,731.91		\$623.00	each blade		\$151,356.00
9	Machining and repair of the generator collector rings	\$15,000.00	\$43,680.00	on-site	\$34,700.00	on-site	\$36,050.00	\$38,204.00	\$49,585.00	\$43,222.90	on-site	\$58,830.00	\$15,004.00					
			\$23,187.00	off-site	\$18,420.00	off-site				\$22,944.83	off-site							
11	Supply of one generator specialist	Included	\$16,120.00		N/A		Included		\$194.00	per hr per man	Included in Base Bid		Included		\$16,292.00			
									\$26,676.00	Start-Up Specialist								
									\$31,000.00	Perf. Bond								
									\$6,300.00	Turb. Rotor Transp. (both ways)								
									\$6,300.00	Nozzle Plate and Diaphragms Transp (both ways)								
SUB-TOTAL:		\$142,500.00	\$303,667.00 - \$324,160.00		\$230,820.00 - \$247,100.00		\$219,184.00		\$856,685.00		\$523,772.00		\$287,520.03 - \$307,798.10		\$225,609.00		\$383,669.00	
**Council should note that the majority of bidders in this section qualified their "not-to-exceed" pricing. They qualified based on assumptions of typical work conducted. For example: On Option 1 NAES based their \$15,000 not to exceed price on 100 man hours. If the man hours exceeds 100 than the price would change. Also, HPI, Turbine Pros and Wood Group's bids are based on a pricing range depending on whether the work is conducted "on-site" or "off-site".																		

SELECTED NOT-TO-EXCEED PRICE OPTION***											
7	Major repair of 14 th thru 17 th stage blades with installation and supply of erosion shields	T & M	\$154,080.00	\$122,400.00	\$206,000.00	\$139,768.00	\$26,987.00	\$152,467.30	\$17,069.00		\$116,525.00
									\$1,004.00	erosion shield each blade	
Electric Services' staff est		\$130,000.00									
SUB-TOTAL:		\$130,000.00	\$154,080.00	\$122,400.00	\$206,000.00	\$139,768.00	\$26,987.00	\$152,467.30	\$18,073.00	\$116,525.00	

***Council should note that NAES bid "time & materials" for Option #7. Based on typical work performed and other bid's submitted from the other bidder's Electric Services' staff estimates

total "not to exceed" with NAES to be \$130,000.									
OVERALL TOTAL (inclusive of IA Sales Tax)	\$807,800.00	\$956,887.00 - \$977,380.00	\$904,300.00 - \$939,580.00	\$1,009,844.00	\$1,693,795.00	\$1,281,823.00	\$1,295,572.63 - \$1,315,850.70	\$1,183,375.00	\$1,459,986.00
OVERALL TOTAL (less IA Sales Tax)	\$778,750.00	\$927,764.55 - \$948,257.55	\$904,300.00 - \$939,580.00	\$971,939.00	\$1,693,795.00	\$1,281,823.00	\$1,241,421.08 - \$1,261,699.15	\$1,183,375.00	\$1,459,986.00

		INVITATION TO BID NO. 2013-037 STEAM TURBINE NO. 8 OVERHAUL BID SUMMARY																											
BIDDER:		NAES Corporation Houston, TX		HPI-LLC Houston, TX		Turbine Pros Rogers, MN		Power Generation Service, Inc Anoka, MN		Turbine Diagnostic Services Odessa, FL		General Electric Intl Inc Omaha, NE		Wood Group Power Plant Services, Inc., Alpharetta, GA		Mitsubishi Power Systems Americas, Inc. Orlando, FL		Midwest Service Center, Hobart, IN		Turbocare Chicopee, MA		Power Plant Field Services Ball Ground, GA							
DESCRIPTION																													
BASE		\$443,800.00		\$445,160.00		\$490,480.00		\$541,492.00		\$629,438.00		\$643,129.00		\$773,593.51		\$863,907.00		\$885,470.00		Non-Responsive.		Non-Responsive.							
IA Sales Taxes included in the above Amount:		\$29,050.00		\$29,122.45		Not included		\$37,905.00		Not licensed to collect IA sales tax		Not included		\$54,151.55		Not included		Not licensed to collect IA sales tax											
Evaluated Base (less all taxes)		\$414,750.00		\$416,037.55		\$490,480.00		\$503,587.00		\$629,438.00		\$643,129.00		\$719,441.96		\$863,907.00		\$885,470.00											
OPTIONS																													
1		Major repair of first stage nozzle parts		\$15,000.00		\$18,250.00		\$14,500.00		\$28,428.00		\$97,836.00		\$14,743.00		\$18,061.69		\$79,753.00		\$36,995.00									
2		Major repair of first stage deflector		\$7,500.00		\$18,250.00		\$14,500.00		\$3,605.00		\$24,221.00		\$4,775.00		\$18,061.69		\$34,776.00		\$23,061.00									
3		Major repair of both rows of first stage rotating blades		\$15,000.00		\$21,650.00		\$17,200.00		\$3,605.00		\$29,436.00		\$9,550.00		\$21,425.14		\$17,069.00		\$26,570.00									
4		Major repair of second thru fifth stage blades		\$30,000.00		\$54,130.00		\$43,000.00		\$7,416.00		\$84,721.00		\$19,100.00		\$53,562.86		\$34,139.00		Minor Repair		\$60,731.00							
5		Major repair of second thru fifth stage diaphragms		\$30,000.00		\$77,540.00		\$61,600.00		\$62,830.00		\$264,581.00		\$60,910.00		\$76,731.91		\$419.00		each blade		\$53,660.00							
6		Major repair of 14 th thru 17 th stage		\$30,000.00		\$74,540.00		\$61,600.00		\$77,250.00		\$317,492.00		\$294,833.00		\$76,731.91		\$623.00		each blade		\$151,356.00							
7		Major repair of 14 th thru 17 th stage blades with installation and supply of erosion shields		T & M		\$154,080.00		\$122,400.00		\$206,000.00		\$139,768.00		\$26,987.00		\$152,467.30		\$17,069.00				\$116,525.00							
																		\$1,004.00		erosion shield each blade									
8		Surface preparation and re-coating of the internals of the main lube oil tank		\$10,000.00		\$3,745.00		No Bid		T & M		\$34,339.00		No Bid		T & M		Exception				\$8,700.00							
9		Machining and repair of the generator collector rings		\$15,000.00		\$43,680.00		on-site		\$34,700.00		on-site						\$43,222.90		on-site									
						\$23,187.00		off-site		\$18,420.00		off-site						\$22,944.83		off-site									
10		Supply of two technical advisors		No Bid		Cannot provide		\$85,150.00		Technical Director day shift		\$123,600.00		per each TFA		\$194.00		per hr per man		\$250,850.00		Included in Base Bid		\$118,913.00		each MPSA TFA		\$139,480.00	
11		Supply of one generator specialist		Included		\$16,120.00		N/A		Included				\$194.00		per hr per man				Included in Base Bid		Included		\$16,292.00					
12		Repowering and boring of four main shaft journal bearings. Include shipping if		\$54,000.00		\$19,970.00		\$42,200.00		on-site				\$19,313.00		\$24,282.00		\$55,941.00		\$43,326.88		\$6,021.00		\$43,330.00					
								\$25,200.00		off-site																			
13		Inspection and testing the generator		\$16,500.00		\$16,120.00		\$20,370.00		\$15,100.00		\$22,500.00		\$24,109.00		\$19,731.06		\$55,015.00				\$20,944.00							
14		Turbine rotor low speed spin balance		\$21,000.00		shop \$17,890.00		\$17,200.00		on-site				\$8,755.00		\$21,122.00		\$7,885.00		\$18,933.85		\$14,750.00		\$10,048.00					
								\$15,200.00		off-site																			
												\$26,676.00		Start-Up Specialist															
												\$31,000.00		Perf. Bond															

\$6,300.00	Turb. Rotor Transp. (both ways)
\$6,300.00	Nozzle Plate and Diaphragms Transp (both ways)