

COUNCIL ACTION FORM

SUBJECT: **POWER PLANT STEAM TURBINE NO. 8 OVERHAUL –
CHANGE ORDER #7**

BACKGROUND:

This project is required to repair or replace worn parts discovered after the opening and inspection of the Power Plant's Unit No. 8 turbine and generator for repairs needed to avoid serious future damage. Repairs and replacement of worn parts are completed as the inspection progresses and work is defined. **Large change orders are a normal and expected part of a major turbine-generator overhaul, due to the fact that many repair needs are unknown until the unit is opened and inspected.**

On January 22, 2013, Council awarded the contract to NAES Corporation, Houston, TX, for Steam Turbine No. 8 Overhaul in the amount of \$807,800. This original amount included the following elements:

- \$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.

Six change orders have previously been issued for this project.

Change Order No. 1 for \$171,482.00 was to increase funds to cover costs associated with turbine repairs that were more extensive than what was included in the base bid.

Change Order No. 2 for \$75,276.95 was for additional steam turbine shell repairs, a recommended hydrogen sealing modification and control valve rack repairs.

Change Order No. 3 for \$18,250.00 was for additional work related to the nozzle block which required significant field lapping to get 100% metal to metal contact between the nozzle block and the shell.

Change Order No. 4 for \$30,000.00 was for extra field labor hours and premium pay for the extended time required to clean and flush the turbine lube oil system and to complete the generator air test.

Change Order No. 5 for \$25,304.00 was for extra field labor hours and premium pay for the extended time for the removal of the stop valve fine screen.

Change Order No. 6 for \$10,309.39 was for additional work related to machining of packing butt caps and new thrust bearing shoes and additional disassembly requested for oil flush.

The total cost of the base contract plus the previous six change orders listed and described above is \$1,138,422.34.

City Council authorization for a seventh change order is now needed. This change order is for extra work to repair or replace seventeen components and equipment assemblies of Unit 8's turbine-generator. This work by NAES Corporation or by its subcontractors was needed in order to bring the unit on-line for the summer heating season. The seventeen items of extra work are as follows:

- 1) Extra work associated with the repair of #3 and #4 hydrogen seal housing
- 2) Repair of the control valves camshaft
- 3) Replacement of parts and repair of the turning gear
- 4) Replacement of parts and repairs made to the turbine-generator control system and governor
- 5) Replacement of parts and repair of five steam control valves
- 6) Replacement of the shaft and repair of the DC oil pump
- 7) Replacement of the shaft and repair of the auxiliary oil pump
- 8) Replacement of parts and repair of the main stop valve
- 9) Repair of diaphragm packing
- 10) Replacement of the #4 control valve seat (sealing surface)
- 11) Extra work to repair steam erosion cuts to the sealing surfaces on the upper and lower shells of the steam chest
- 12) Extra work to inspect and clean the turbine rotor following shop repairs
- 13) Extra work to check and measure the T1 bearing torque check
- 14) Extra work to inspect and clean T2 and T4 bearings following shop repairs
- 15) Extra work necessary to prepare T1 bearing ready to oil flush
- 16) Extra work to measure diaphragm spill strips for machining for proper fit and clearance
- 17) Extra work associated with shipping, receiving, and handling diaphragms as a part of the inspection, measurement, and repair process

The total cost of Change Order No. 7 is \$78,121.00.

These work items could not be anticipated at the time overhaul of the unit began. In addition, there was not sufficient time to suspend work to gain pre-approval from the City Council prior to completion of the work without impacting service. Staff authorized these 17 work items in accordance with Section 8.02 "Rapid-need Purchases" in the City's Purchasing Policies and Procedures.

This seventh change order will increase this portion of the Steam Turbine No. 8 Overhaul project cost by an additional \$78,121.00. This will bring costs for this portion of the project to \$1,216,543.34.

The engineer's estimate to perform the overhaul work with the original work scope, parts, and a reasonable amount of repair was \$2,585,000.00. The approved FY 2012/13 Budget and Capital Improvements Plan included \$3,500,000 for the turbine generator overhaul, including parts, professional technical assistance, and contractor services. Approximately \$627,000 remains from that budget, which will be carried over to cover the costs associated with this Change Order. **It is worth noting that under a separate Council Action Form before the City Council tonight, staff is requesting delay of a contract that once approved would reduce the balance by roughly an additional \$250,000.**

ALTERNATIVES:

1. Approve contract Change Order No. 7 to NAES Corporation of Houston, TX, in the amount of \$78,121.00 for the City of Ames Steam Electric Plant Steam Turbine No. 8 Overhaul.
2. Reject contract Change Order No. 7.

MANAGER'S RECOMMENDED ACTION:

This work was needed to help restore the steam turbine back to good working order in time for the 2013 summer season. The contractor originally billed the City \$131,925 for this work. Staff has devoted the past 4 months to reviewing these costs and working with NAES to insure that the City would only pay for work that was not included in the original project scope.

Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1, thereby approving contract Change Order No. 7 to NAES Corporation of Houston, TX, in the amount of \$78,121.00.