

COUNCIL ACTION FORM

SUBJECT: CHANGE ORDER NO. 2 - UNIT 7 TURBINE GENERATOR MAJOR OVERHAUL – ADDITIONAL SPARE PARTS

BACKGROUND:

The Power Plant's two steam turbine-generator units must be periodically disassembled for inspection and repair. The basic scope of work is commonly referred to as "open, clean, and close." In this process, the turbine-generator is opened (disassembled), cleaned (key parts and components are measured, cleaned, and repaired or replaced), and closed (reassembled for operation). The 2018/19 Capital Improvements Plan included a project to perform this type of overhaul on the Unit 7 turbine and generator.

During the disassembly and cleaning phases of the turbine-generator overhaul, other problems are typically discovered that were not anticipated or could not be quantified before the internals of the turbine-generator were exposed. Many of the parts which are known to wear over time are ordered prior to the turbine-generator; however, condition of most of the parts are unknown until the the unit can be disassembled and inspected. These change orders are to cover additional bolting, bearings, bushings, valve parts and other miscellaneous parts that were identified during inspection that need replaced.

PRIOR ACTIONS:

On May 14, 2019, the Ames City Council approved separate contracts with Argo Turboserve Corporation (ATC) and Mechanical Dynamics & Analysis LLC (MD&A) to provide spare parts for the Unit 7 turbine-generator at the City's Electric Plant. These parts are obtained from each vendor depending on which is able to provide the lowest cost replacement parts. The original contract amount for ATC was \$265,694.00 and the original contract amount for MD&A was \$114,613.67, for a total of \$380,307.67.

Change Order No. 1, for \$39,961.60, was issued to Argo Turboserve Corporation contract and approved by staff for additional spare parts identified to be replaced during the turbine-generator overhaul.

Change Order No. 1, for \$4,581.85, was issued to Mechanical Dynamics & Analysis LLC, contract and approved by staff for additional spare parts to be replaced.

These first change orders were initiated prior to the completion of the analysis of the turbine. This was done intentionally in order to obtain pricing and shorten the lead time for these parts as soon as it was known they were needed. It was anticipated that as the evaluation continued, additional replacement parts would

be needed. However, waiting to order all the parts until completion of the analysis would delay the return of the turbine to service. Because the turbine shaft and key components are undergoing continued evaluation, there is a possibility that further change orders for replacement parts will be needed.

THIS ACTION:

Additional parts were identified as worn by HPI, the on-site contractor, GE, the onsite technical advisor for the turbine generator overhaul, and field verified by plant staff. Pricing for the additional parts were received from Argo Turboserve Corp and Mechanical Dynamics & Analysis LLC. Parts were selected from each vendor based on availability, lead times, and cost.

- Parts from MD&A total: \$20,487.60
- Parts from ATC total: \$12,534.29

Therefore, this action is to request approval of two change orders: Change Order No. 2 to ATC and Change Order No. 2 to MD&A for a total of \$33,021.89 for the necessary repairs on the steam turbine as described.

The approved FY 2018/19 Capital Improvements Plan includes the following funding for the Unit 7 Turbine Generator Overhaul.

2017/18 Engineering/Parts	\$750,000
2018/19 Labor	\$1,500,000
2018/19 GE Tech Support	\$200,000
TOTAL	\$2,450,000

The Engineer's estimate for the total cost of the project is \$2,440,000. To date, \$1,369,821.30 has been authorized for this project (labor contract amount of \$694,984, GE Tech Support, \$249,986.22, parts amount of \$424,851.12). With these second change orders, the authorized total for parts for the project is \$457,873.01, and an overall project cost of \$1,402,843.10. Adding sales taxes yields a budget total of \$1,451,491.90. This leaves \$998,508.10 available in the project budget.

ALTERNATIVES:

1. a. Approve Change Order No. 2 to Argo Turboserve Corporation of Rutherford, NJ in the amount of \$12,534.29, inclusive of applicable sales tax.
b. Approve Change Order No. 2 to Mechanical Dynamics & Analysis, LLC of Clifton, NY in the amount of \$20,487.60 inclusive of applicable sales tax.
2. Do not approve the requested change order.

CITY MANAGER'S RECOMMENDED ACTION:

These repairs to Unit #7's steam turbine are critical to restore the performance and integrity of the unit. The tests and repairs proposed could not be anticipated prior to opening the unit for preliminary inspection and, therefore, could not be made a part of the original contract scope of work. Engineers from the Electric Department have evaluated the proposed work in the change order and agree that the scope and pricing are appropriate.

If approved, staff will work with the part suppliers to immediately manufacture (if needed) and ship spare parts. If delayed, the turbine may not be repaired and reassembled before the Unit #7 boiler tube project is complete. This would delay the return of the unit to service.

Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1a and b as described above.