

COUNCIL ACTION FORM

SUBJECT: UNIT 8 TURBINE-GENERATOR OVERHAUL PROJECT – CHANGE ORDER NO. 4

BACKGROUND:

On June 23, 2020, the City Council approved plans and specifications for the Unit 8 Turbine-Generator Overhaul Project. The Unit 8 Turbine-Generator is disassembled at regular intervals to inspect the turbine and the generator for repairs and to install replacement parts that may be needed to prevent unplanned turbine-generator outages, prevent costly turbine-generator damage, and increase turbine-generator efficiency and reliability.

Repairs and replacement of worn parts will be completed as the inspection progresses. Experience has shown that certain parts require replacement every major overhaul and some parts become unusable during the disassembly process. This overhaul to repair and replace parts is required and recommended by boiler and machinery insurance carriers and follows accepted industry standards. This contract is for labor and materials for the inspection and repairs to Unit 8 turbine-generator. Spare parts are made available to the contractor for repair and replacement and are bid under a separate contract.

Award of contract was made October 13, 2020, to Blade Runner Turbomachinery Services (BRTS), LLC of Navasota, Texas, for the base bid and Alternate #10 (Turbine Lube Oil System High Speed Flush) in the amount of \$699,800 (plus applicable sales taxes to be paid by the City).

Once the turbine was opened, it was determined that the generator rotor needed to be removed, shipped to a repair facility, and undergo a re-winding. To accomplish this work, Change Order #1 was approved by the City Council on September 28, 2021, in the amount of \$607,678.37 (plus \$42,537.49 in sales taxes to be paid by the City).

Change Order #2 authorized the contractor to disassemble the turbine stop valve, clean the main valve and seat, transport the pilot valve and seat to a shop in Chicago where parts were machined to correct tolerances, and then re-install the parts into the turbine stop valve. The cost for Change Order No. 2 was \$26,993.86 (plus \$1,889.57 in sales taxes to be paid by the City) and approved by the City Manager.

Change Order #3 was approved by the City Council on October 26, 2021 in the amount of \$181,357.44 (plus \$12,695.03 in sales taxes to be paid by the City). This change order was for performing four major items: a low-speed balance test of the turbine rotor, major repairs to the diaphragms (stationary blades), machine work on the casing, and to perform bearing repairs.

THIS ACTION:

The action now being requested is to approve Change Order No. 4 to Blade Runner Turbomachinery Services in the amount of \$123,843.27. This change order includes three items: additional costs incurred that are outside the original scope of work due to Unit 8 crane delay, additional work/machining for bucket installation, and installing a new gear in the turning gear. This change order requires an additional \$8,669.03 to be paid in sales taxes by the City to the state of Iowa.

The Unit 8 crane delay has caused additional costs for this contract because it resulted in the overhaul project not being able to be completed within the originally planned 8-week project window. The Electric utility is subject to requirements from the Mid-Continent Independent System Operator (MISO). In order to meet MISO operating requirements, Unit 8 needed to be operational by August 29, 2021 and operate for 30 days to avoid potentially costly consequences. Therefore, the project scheduling expected the contractor to mobilize in June and complete the project before this August 29 deadline.

Ahead of the overhaul project, the Unit 8 crane was supposed to be rebuilt by a separate contractor. The crane is necessary to completely disassemble the turbine and generator components for inspection and repair. However, the crane was not returned to service prior to the turbine/generator overhaul project commencing, despite the original completion date of the crane rebuild being October 31, 2020.

Therefore, Blade Runner mobilized to the site on June 11, 2021 and GE (technical services) was on site June 14, 2021, to begin the outage on Unit 8. Blade Runner performed what could be done without the overhead unit crane, expecting the crane to be available within days. **Due to delays by the crane contractor because of material availability, the crane was not installed until June 12, 2021.** The next day, the crane failed its load certification test and was rendered inoperable.

Ames staff believed the crane contractor could repair the crane and pass the test within a few days. However, it became apparent that the crane would not be available in time to complete the entire overhaul before MISO's August 29 deadline. Therefore, Electric staff determined it would be best to perform all repairs that would ensure Unit 8's availability by the 29th, operate the unit for the 30-day requirement, and then return to perform the remaining overhaul scope in a second maintenance outage beginning October 4.

The Unit 8 crane was repaired and certified on July 23, 2021. Blade Runner and GE returned to site on October 4 and have continued the work to complete the entire scope of the overhaul. **Unfortunately, the unavailability of the crane slowed down the project and a large portion of the tasks that needed to be performed before the August 29th deadline need to be recompleted to accomplish the remaining overhaul scope. These tasks include additional mobilizing costs, a second disassembly and reassembly of main components, and extending the rental of equipment and tools.**

While some of the performed tasks were part of the original scope, it was less efficient to perform them without the crane. The additional work includes fitting different style blade attachments than what was originally on the turbine. The different blade attachment style is needed because the original style is unavailable. The additional rotor work is to remove the old turning gear, machine the new gear, and install on the turbine rotor. The City also experienced additional costs with GE technical services due to the delay; these costs are addressed in a separate Council Action Form.

This Change Order, in an amount of \$123,843.27 plus tax, increases the total Blade Runner contract amount to \$1,754,450.06. Contracts awarded to date on this project are:

Argo	Parts	\$ 1,077,109.00
Argo	City to pay sales tax	\$ 74,711.63
MD&A	Parts (sales tax included)	\$ 191,461.85
Power Plant Services	Parts (sales tax included)	\$ 147,224.65
Burns & McDonnell	Engineering	\$ 39,176.89
General Electric	Technical Support	\$ 242,800.00
General Electric	CO #1 (Separate Council Action)	\$ 91,000.00
Blade Runner	Prime Contractor	\$ 699,800.00
Blade Runner	City to pay sales tax	\$ 48,986.00
Blade Runner	CO # 1	\$ 607,678.37
Blade Runner	City to pay sales tax	\$ 42,537.49
Blade Runner	CO # 2	\$ 26,993.86
Blade Runner	City to pay sales tax	\$ 1,889.57
Blade Runner	CO # 3	\$ 181,357.44
Blade Runner	City to pay sales tax	\$ 12,695.02
Blade Runner	CO # 4 (This Council Action)	\$ 123,843.27
Blade Runner	City to pay sales tax	\$ 8,669.03
	TOTAL	\$3,617,934.07

The Engineer's estimate for the cost of the total project was \$2,488,000, although it is very difficult to determine the repair cost before the unit is completely disassembled and measured/tested. Funding for the Unit 8 Turbine-Generator Overhaul Project was originally budgeted in the 2019/20 CIP in the amount of \$3,000,000. **Funds to finance expenses exceeding that amount will be taken from savings related to Unit 7 Boiler Repair Project CIP, the Unit 7 Turbine-Generator Overhaul CIP, and the Unit 8 Turbine & Generator Maintenance account.**

In total, funds are available for this project as follows:

2019/20 Unit #8 Turbine Generator Overhaul CIP	
Materials/Parts	\$1,000,000.00
Construction	1,650,000.00
GE Tech Support	350,000.00
Unit 7 Boiler Tube CIP	311,623.00
Unit 7 Overhaul CIP	288,924.12
Unit 8 Turbine & Generator Maint.	55,000.00
TOTAL	\$3,655,547.12

City staff is reviewing the crane contract and the events leading up to the failure of the crane during the load certification testing. The delays that resulted from this incident have resulted in this cost increase as well as other cost increases to re-mobilize other contractors on this project. Staff is consulting with legal counsel to determine the liability the crane contractor has for these costs and will consider pursuing a claim against the crane contractor and/or others responsible for the damage and resulting delays.

ALTERNATIVES:

1. Approve Change Order No. 4 to Blade Runner Turbomachinery Services, LLC of Navasota, Texas, in the amount of \$123,843.27 for the Unit 8 Turbine-Generator Overhaul Project.
2. Do not approve the change order and direct staff to seek other options available to complete this work.

CITY MANAGER'S RECOMMENDED ACTION:

Approving this change order will restore the Unit 8 generator rotor to near like-new condition, providing reliable generator availability and performance for the future.

Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative #1 as stated above.