ITEM # 10
DATE: 10-26-21

COUNCIL ACTION FORM

SUBJECT: UNIT 8 TURBINE-GENERATOR OVERHAUL PROJECT – CHANGE ORDER NO. 3

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 in an overhaul of this nature are 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, LLC of Navasota, Texas, for the base bid and alternate #10 (Turbine Lube Oil System High Speed Flush) in the amount of $699,800. This vendor is not licensed to collect taxes for the State of Iowa. Therefore, the City of Ames will pay applicable sales tax ($48,986) directly to the State of Iowa.

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). This change order was for the purpose of shipping the Unit 8 rotor to a facility to be disassembled, rewound, tested, and balanced. Funding was added from the Unit 7 Boiler Tube CIP project to finance this change order.

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-installed 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.

THIS ACTION:

The action now being requested is to approve Change Order No. 3 to the Unit 8 Turbine-Generator Overhaul Project. This change order work, for $181,357.44, includes four major items: low speed balance test, major repairs to the diaphragms (stationary blades), machine work on the casing, and bearing repairs. This change

order requires an additional $12,695.02 to be paid in sales taxes by the City to the state of Iowa.

The low speed balance test will be performed once replacement blading and repairs are completed on the rotor in the repair shop. The rotor will be turned at 300 revolutions per minute and tested to determine if/where weights are needed to provide a balanced rotor. A properly balanced rotor operates more efficiently and prolongs the life of the bearings and shaft.

The diaphragm repairs include welding additional material and machining to the blades to restore the original contour and shape. The welding work will be done on site.

Casing repairs include machining and welding material onto the casing faces to restore original shape. A number of areas on the casing showed excessive wear due to steam erosion. The tolerances between the casing and turbine blades will be corrected and produce a more efficient steam path and prolong the life of the turbine casing. The casing work will be done on site.

The bearing repairs will involve machining the bearings to the correct size in order to maintain the OEM required tolerances between the shaft and bearing. The City had one spare bearing. Both the spare bearing and the bearing installed were found to be out of spec. Both bearings will be sent offsite to a machine shop to be corrected.

This Change Order increases the total contract amount to $1,621,937.75. The extent of repairs to the turbine generator were not known until the equipment was disassembled. The repairs are important to keep the equipment operating efficiently and prevent further damage.

Contracts awarded to date on this project are:

Argo (Parts)	$1,077,109.00
(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
Blade Runner Base Bid (Contractor)	699,800.00
(City to pay sales tax)	48,986.00
Blade Runner CO #1	607,678.37
(City to pay sales tax)	42,537.49
Blade Runner CO #2	26,993.86
(City to pay sales tax)	1,889.57
Blade Runner CO #3 (this Council Action)	**181,357.44**
(City to pay sales tax)	**12,695.02**
TOTAL	$3,394,421.77

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 total. Funds to finance expenses exceeding that amount will be taken from the Unit 7 Boiler Tube CIP and Unit 7 Turbine/Generator Overhaul CIP. In total, funds are available for this project as follows:

2019/20 Materials/Parts	$1,000,000.00
2019/20 Construction	1,650,000.00
2019/20 GE Tech Support	350,000.00
Unit 7 Boiler Tube CIP	311,623.00
Unit 7 Overhaul CIP	288,924.12
TOTAL	**$3,600,547.12**

ALTERNATIVES:

1. Approve Change Order No. 3 to Blade Runner Turbomachinery Services, LLC of Navasota, Texas, in the amount of $181,357.44 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.