

**COUNCIL ACTION FORM**

**SUBJECT: INSPECTION OF GT1 COMBUSTION TURBINE TO DETERMINE  
OPTIONS AND COSTS OF RETURNING UNIT BACK TO SERVICE**

**BACKGROUND:**

On July 8, 2013, the engine of GT1 combustion turbine catastrophically failed while operating. GT1 is one of two combustion turbines used to augment Units 7 and 8 at the City's Power Plant. At the time of the failure, the front compressing section of the engine was rotating at 5,900 revolutions per minute (rpm) when it threw blades and tore much of that section and the inlet vanes and cowling apart. The compressor failure caused other collateral damage to the engine and other components of the combustion turbine. The root cause of the failure is unknown at this point.

This incident is covered by the City's property insurance coverage. Immediately following the failure, the City's Risk Manager notified the appropriate insurance contacts. Very shortly following the failure, an insurance adjuster and an engine consultant hired by the insurance adjustment company visited the site to observe the aftermath of the failure. The City also provided the adjuster and the engine consultant with all available documentation they had requested.

**City staff subsequently issued a request for proposal (RFP) to the original equipment manufacturer (OEM), Wood Group Pratt & Whitney (WGPW), for the purpose of inspecting the post-failure combustion turbine to determine the extent of damage and to identify the repair options and associated repair costs to return the unit back to service. The OEM was chosen for this task because it was deemed that they could provide the most valid assessment of the damage and the repair options.**

The proposal for this work from WGPW is itemized below:

- 1) On-site inspection and documentation of the engine failure and resultant damage; removal of the engine from its base plate and compartment and placement onto a shipping stand and preparation for shipment; completion of the visual inspection of the engine compartment after the removal of the engine to determine what other systems and equipment need repair or replacement; provide motor carrier transport from Ames to WGPW's facility; provide detailed field services report.

Estimated cost of \$23,264.50

- 2) Receive engine at WGPW's facility; disassemble, inspect, and document the

shop inspection of the engine; evaluate failure and provide an engineering report.

Cost of \$82,848.43

- 3) Field inspect expander (free turbine). To be performed by Energy Services, Inc.

Estimated cost of \$6,387.50 plus expenses.

- 4) Field inspect electric generator. To be performed by Leppert-Nutmeg, Inc.

Estimated cost of \$14,308.00 plus expenses.

*Note: The costs for the four items above reflect an increase of 2.2% due to 2014 pricing versus the pricing in the original proposal (August 2013) from WGPW.*

In addition to the amounts noted above, the overall cost estimate for this work includes \$7,150 for the expenses noted under Items 3 and 4 above, as well as a 10% administration fee that WGPW will apply to the invoices from its two subcontractors, Energy Services and Leppert-Nutmeg. **This brings the total estimated cost for all work described above to \$136,027.98.**

Even though the failure of the engine, based upon visual observations, did not seemingly damage the expander (free turbine) and the generator, it is important to perform an inspection and assessment of them, since staff does not know their condition, related to the engine failure or otherwise. Since we are on a path to return the combustion turbine to service (with a repaired or replacement engine), it is important to make sure we are mating a repaired or replacement engine to an expander and electric generator in good condition.

Once the inspections and assessments of the engine, expander, and generator are completed, WGPW will provide the City with a report of the findings which will include the options and costs for returning the combustion turbine to service.

**It is important to emphasize that the expenditures highlighted above do not cover the costs for repair or replacement of any of the combustion turbine's components (the engine, expander, electric generator, or any of the balance-of-plant equipment).**

The cost of these inspections and assessments will be included in the insurance claim and will be applied against the City's insurance deductible (\$350,000). As shown on page 69 of the 2014/15 Capital Improvements Plan, \$1,500,000 is budgeted for engine replacement and generator/turbine inspection and overhaul work on GT1.

**In order to proceed with this work, Council will need to waive the City's standard**

**purchasing policies requiring formal competitive bids. This waiver is recommended due to Wood Group Pratt & Whitney's unique capacity – as the Original Equipment Manufacturer – to evaluate the condition of GT1 and to make recommendations for how the unit can best be returned to service. WGPW is uniquely qualified to provide services to inspect and assess the failure of GT1 combustion turbine engine and to identify the items needing repair or replacement and the associated costs.**

**ALTERNATIVES:**

1. Waive the City's purchasing policy requirement for formal bidding procedures and award a contract with Wood Group Pratt & Whitney of Bloomfield, Connecticut, for up to \$136,027.98 to provide services to inspect and assess the failure of GT1 combustion turbine engine necessary to identify the items needing repair or replacement and the associated costs.
2. Direct staff to solicit proposals for inspection and assessment from other service and repair providers of this engine.

**MANAGER'S RECOMMENDED ACTION:**

This work is necessary to evaluate whether the City's GT1 combustion turbine engine can and should be repaired versus other options, and to also assess the condition of the unit's expander (free turbine) and electric generator. Wood Group Pratt & Whitney is the OEM for GT1's engine, and is therefore regarded to be in the best position to evaluate the condition of GT1 following the engine failure and to identify and cost out options to return the unit to service in good operating condition.

This generating unit provides needed capacity and provides quick energy production in an emergency. Failure to return the unit to service will require the City to purchase replacement capacity and/or explore the purchase and installation of a new generating unit.

Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1 as stated above.