



RIVERSIDE PUBLIC UTILITIES

Board Memorandum

BOARD OF PUBLIC UTILITIES

DATE: MARCH 10, 2025

SUBJECT: URGENT GAS TURBINE REPAIRS ON UNIT 2 AT RIVERSIDE ENERGY RESOURCE CENTER

ISSUE:

Consider receiving and filing an overview of the urgent gas turbine repairs on Unit 2 at Riverside Energy Resource Center.

RECOMMENDATION:

That the Board of Public Utilities receive and file an overview of the urgent gas turbine repairs on Unit 2 at Riverside Energy Resource Center.

BACKGROUND:

The Riverside Energy Resource Center (RERC) is equipped with four General Electric (GE) LM6000 gas turbine engines, which collectively provide up to 30 percent of Riverside's daily electric power demands during the summer months. This facility was constructed in two phases: Units 1 and 2 were commissioned in 2006, followed by Units 3 and 4 in 2011. Each of these fast-start gas turbine units can generate 50 megawatts (MW) of electricity in less than ten minutes and are strategically located in the city limits providing local generation capacity. The availability of these units is critical to ensuring that Riverside Public Utilities (RPU) can meet the minimum electricity demand and reliability needs.

Annual routine preventative maintenance tasks are performed by staff on all RERC units during the schedule outage in November. Specialized borescope inspections are conducted on each gas turbine by highly trained authorized service technicians as a standard industry practice. These inspections provide a detailed view of the turbine's critical internal components and allow the assessment of its overall operating conditions.

On November 4, 2024, during the annual borescope inspection of Unit 2, significant cracks were discovered on a stage one nozzle segment of the low-pressure turbine (LPT) which is located immediately after the second stage high-pressure turbine component, as indicated by the red arrow in Figure 1.

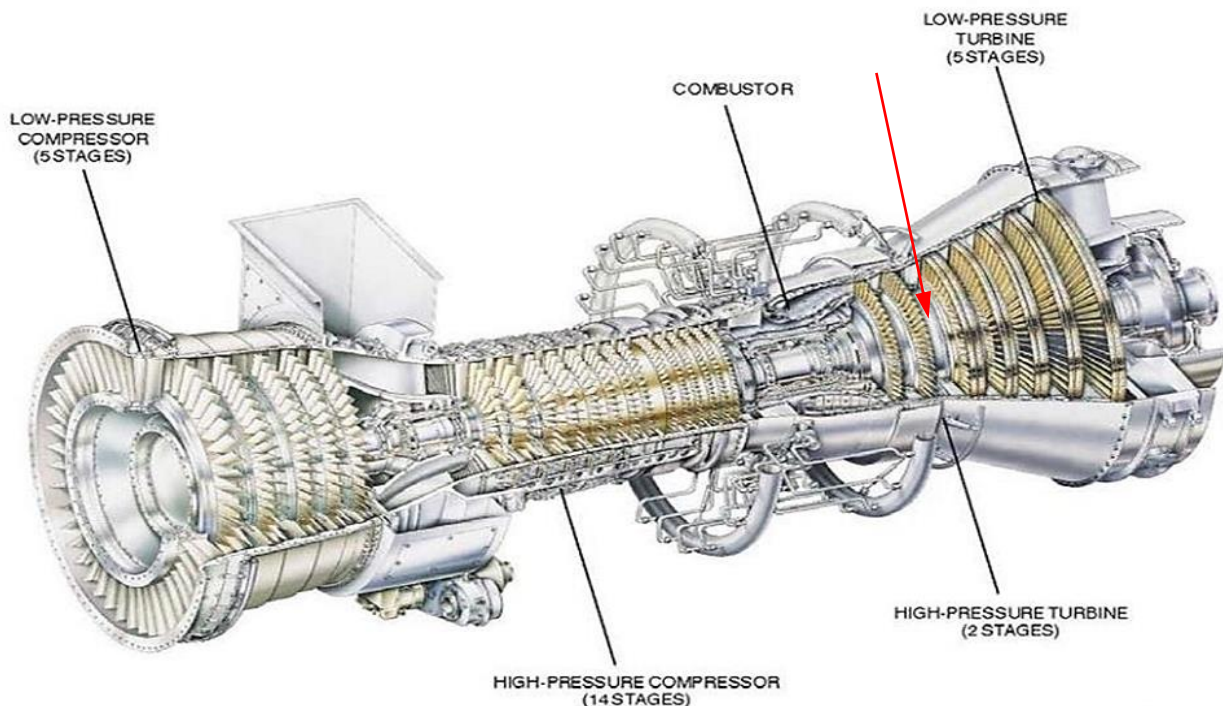


Figure 1. LM-6000 GE natural gas turbine engine.

Examples of the detected cracks in this stage one nozzle are shown in Figures 2 and 3.



Figure 2. Stage one nozzle - lateral crack



Figure 3. Stage one nozzle - flume crack

Following this inspection, GE engineers performed a more detailed evaluation of the results and confirmed the unserviceable condition and agreed that these cracks are above the allowable limits. The GE team explained that Unit 2 can still be operated on a limited basis if needed, although such operation is not recommended.

The extended loss of even one unit at RERC represents an emergency for the City of Riverside. It could result in substantial negative impacts to the safety and health of the public as it reduces the capacity of available power that may be required during any emergency power supply interruptions. Completing repairs on the turbine can potentially take up to six months as there are only four authorized service providers worldwide. Due to the limited options and resources, it was critical to issue a Purchase Order as soon as possible to secure the parts and ensure Unit 2 is

readily available for operations in the event of unexpected power outages and before summer 2025 when the demand for additional power is at its peak.

On November 13, 2024, the request to approve the emergency repairs was submitted to the Utilities General Manager and the City Manager. Approval to proceed with the repairs and issue a Purchase Order was received on November 14, 2024.

DISCUSSION:

Given the urgency to get this unit repaired and fully available, staff quickly contacted the four authorized service providers (ASP) regarding the availability of parts and to request proposals for the completion of the necessary work. There were two repair options presented.

Repair Options:

- **Remove & Repair LPT**

This option involves removing the LPT sectional component of the turbine and sending it to one of four authorized repair facilities, three of which have provided preliminary quotes ranging from \$600,000 to \$800,000. This cost only covers the removal, disassembly, and replacement of the stage one nozzle. Given the turbine's age (19.5 years), additional damage is likely to be discovered during disassembly, potentially adding \$500,000 to \$2,000,000 in replacement costs. Additionally, the limited availability of parts for the LM6000 due to ongoing supply-chain disruptions could potentially result in a significant delay in the completion of the repairs (e.g., a delay that extends into and potentially beyond summer 2025).

- **Swap-Out LPT**

This option involves exchanging out the entire LPT sectional component of the turbine with a refurbished and rebuilt replacement LPT sectional component. GE is the one authorized service provider that can reliably provide this option and has provided staff with a firm quote of \$2,923,122, which includes sales tax and all shipping, delivery, and installation costs. While this option has a higher initial cost, it offers several benefits. It provides firm pricing with no expected deviations and can be completed onsite at RERC within 7 days. GE has confirmed delivery by June 30, 2025, allowing RERC Unit 2 to return to unrestricted service for most of the summer. Additionally, Unit 2 can remain available for dispatch, completing mandatory emissions tests and responding to emergency power needs. Replacing the entire LPT section will also extend the unit's service life, as the refurbished LPT will include all "like-new" parts.

After a thorough evaluation, staff has determined that proceeding with the swap-out of the LPT is the best option for the health and safety of the public as it will ensure Unit 2 will be fully available for operation by early July 2025. Additionally, each unit currently provides Riverside with nearly \$11,000,000 of local, flexible summer resource adequacy credit (Local-FRAC RA) in the CAISO market, along with extra energy revenues during the summer (approximately \$250,000 to \$400,000 per unit per month).

To guarantee the parts delivery date of June 30, 2025, and to authorize GE to perform the necessary repairs on site, Purchase Order No. 253102 was issued on November 14, 2024. The repairs will be performed onsite at RERC and are expected to take approximately 7 days to complete. Prior to the repair, Unit 2 will remain available for limited use. Following the completion

of the repairs, staff will take this item to the Board of Public Utilities for final ratification.

Table 1. Timeline of Events

Date	Action
November 4, 2024	Borescope Inspection Unit 2 – Unserviceable cracks
November 4, 2024	Staff declared urgent repairs to Unit 2 required
November 4-8, 2024	Obtained proposals from all ASP's
November 13, 2024	Request for approval - Utilities General Manager and City Manager
November 14, 2024	Obtained approval to proceed with repairs
November 14, 2024	Determined the swap-out to be the best option
November 14, 2024	PO No. 253102 issued to GE to secure parts
June 30, 2025	Anticipated arrival of the rebuilt LPT section
Early July 2025	Estimated completion of the removal and installation of LPT section
Early August 2025	Final Ratification will be presented to RPU Board

Purchasing Resolution 24101, Section 302 (c) states “Emergency Procurement may be initiated by the head of a Using Agency or his or her duly authorized representative (the “individual”) only as follows: For urgent purchases relating to Riverside Public Utilities, Article XII, Section 1202(b) of the City’s Charter applies and shall be followed.” Section 1202(b) of Article XII of the Riverside City Charter provides the following: “a purchase, or acquisition, construction, extension, enlargement, diminution or curtailment may be made without prior approval (2) if there is an urgent necessity to preserve life, health or property (i) as determined by the Director of Public Utilities or, (ii) if the amount exceeds \$100,000 by the Director of Public Utilities and the City Manager. As soon as practicable thereafter, the Director of Public Utilities shall take the matter under Section 1202(b)(2) to the Board of Public Utilities for ratification.”

The Purchasing Manager concurs that the recommendations are in compliance with Purchasing Resolution 24101.

STRATEGIC PLAN ALIGNMENT:

This item contributes to the following strategic priorities and goals from the Envision Riverside 2025 Strategic Plan:

Strategic Priority 5, High Performing Government

Goal 5.4. Achieve and maintain financial health by addressing gaps between revenues and expenditures and aligning resources with strategic priorities to yield the greatest impact.

Strategic Priority 6, Infrastructure, Mobility & Connectivity

Goal 6.2. Maintain, protect, and improve assets and infrastructure within the City’s built environment to ensure and enhance reliability, resiliency, sustainability, and facilitate connectivity

The item aligns with EACH of the five cross-cutting threads as follows:

1. **Community Trust** – Ensuring that RERC Unit 2 operates reliably during critical periods and provides electricity to Riverside Public Utilities’ (RPU) electric customers, serves the greater public good.
2. **Equity** – This item ensures that RERC Unit 2 can safely and effectively operate and provide reliable electricity benefiting the entire City and all customers.

3. **Fiscal Responsibility** – Riverside is a prudent steward of public funds and ensures responsible management of the City's financial resources while providing quality public services to all. This will ensure that RERC Unit 2 will be readily available during the most critical times.
4. **Innovation** – Replacing the entire LPT section on RERC Unit 2 will extend the unit's service life, as the refurbished LPT will include all "like-new" parts.
5. **Sustainability & Resiliency** – RERC operates during the most critical times when the demand for electricity is high and beyond the capacity from renewable sources. Performing the repair on RERC Unit 2 prevents an extended outage and supports the goal of sustaining highly reliable power plant operations

FISCAL IMPACT:

The total fiscal impact is \$2,923,122. Sufficient funds are available in Public Utilities Electric CIP OH/UG Substations Generating Station Account No. 6130100-470627.

Prepared by:	Scott Lesch, Utilities Assistant General Manager/Power Resources
Approved by:	David A. Garcia, Utilities General Manager
Certified as to availability of funds:	Kristie Thomas, Finance Director/Assistant Chief Financial Officer
Approved by:	Rafael Guzman, Assistant City Manager
Approved as to form:	Jack Liu, Interim City Attorney

Attachment: Presentation