

OVERVIEW OF URGENT GAS TURBINE REPAIRS ON UNIT 2 AT RERC

Riverside Public Utilities

Board of Public Utilities

March 10, 2025

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BACKGROUND

Riverside Energy Resource Center (RERC)

1. 196 MW - Four General Electric (GE) LM6000 gas turbine engines
2. Units 1 & 2 Commissioned in 2006
3. Units 3 & 4 Commissioned in 2011
4. Provide up to 30% of Riverside's daily electric power demands during summer months
5. Availability is critical to ensuring RPU can meet minimum electricity demand and reliability needs



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BACKGROUND

1. Borescope Inspection
 - a. Performed annually as standard industry practice
 - b. Highly trained authorized service technicians
 - c. Detailed view of the gas turbines critical internal components
 - d. Allow the assessment of overall operating conditions
2. RERC Unit 2 Inspection – November 4, 2024
 - a. Discovered cracks on stage one nozzle segment of low-pressure turbine (LPT)
 - b. GE Engineers performed a more detailed evaluation
 - Confirmed unserviceable condition
 - Above allowable limits
 - Can be operated on a limited basis

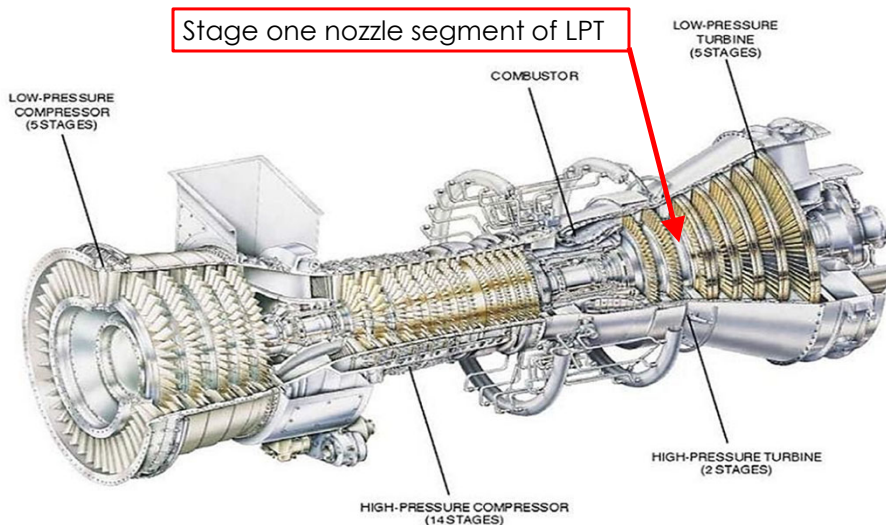


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BACKGROUND – GE LM6000 LPT



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BACKGROUND – STAGE ONE NOZZLE



1. Examples of the detected cracks
 - a. A crack of this nature is expected through normal operations for a turbine of this age (19.5 years)
 - b. First time this type of maintenance is required on RERC Unit 2



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BACKGROUND – URGENCY

1. Extended loss of a unit has substantial negative impacts to the safety and health of the public
2. Reduced capacity of available power that may be required during summer peak or emergency power supply interruptions
3. Only four authorized service providers (ASP) worldwide
4. Repairs can take up to 6-9 months due to limited resources
5. November 13, 2024, request to approve emergency repairs submitted to Utilities General Manager and City Manager
6. November 14, 2024, approval to proceed with repairs and issue a Purchase Order was received



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BACKGROUND – REPAIR OPTIONS

1. Proposals were obtained from the four authorized service providers
2. Two repair options:
 - a. Remove & Repair LPT
 - i. Remove LPT and send to authorized repair facility
 - ii. Preliminary cost - \$600,000 to \$800,000 from three ASP's
 - iii. Additional repairs are likely to be discovered given the age of the turbine – additional \$500,000 to \$2,000,000
 - iv. Limited availability of parts could result in significant delays in completion of the repairs
 - v. Increase in RA cost due to unavailability – Potential \$11,000,000 cost if unavailable all summer
 - b. Swap-Out LPT
 - i. Exchange entire LPT sectional component with a refurbished and rebuilt replacement
 - ii. GE Vernova is the one ASP that can reliably provide this option
 - iii. Firm quote of \$2,923,122 – Delivery date of June 30, 2025
 - iv. Repair can be completed within 7 days onsite at RERC



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DISCUSSION – SELECTED REPAIR

1. Determined the swap-out was the best option for the health and safety of the public
 - a. Unit 2 will remain available for limited use for mandatory emissions testing and emergency power needs
 - b. Refurbished LPT will include all “like-new” parts
 - c. Unit 2 will return to unrestricted service for most of summer
2. Purchase Order No. 253102 was issued to GE Vernova to guarantee the rebuilt LPT section will be delivered on June 30, 2025



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DISCUSSION – TIMELINE	
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



STRATEGIC PLAN ALIGNMENT

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 and 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.

Cross-Cutting Threads

Community Trust

Equity

Fiscal Responsibility

Innovation

Sustainability & Resiliency



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.

