

RECIPROCATING INTERNAL COMBUSTION ENGINE (RICE) — ASSET MANAGEMENT

Group Supplemental Project



PROJECT HIGHLIGHTS

- Benchmark asset management and performance metrics and identify best practices
- Improve asset reliability and performance
- Increase plant availability/capacity
- Introduce risk-based asset management and facilitate industry-level information sharing

Background, Objectives, and New Learnings

As the power sector increasingly depends on variable renewable energy resources, reciprocating internal combustion engines (RICE) are growing in importance due to their operational flexibility, high efficiency throughout their load range, ability to use multiple fuels, modular nature, and competitive cost. RICE have shown potential for providing distributed generation and ancillary services, particularly for balancing intermittent renewables, and are considered for baseload operations in certain instances.

Because this new class of medium-speed engines has only been offered for power generation over the past five to 10 years, there is limited experience with RICE in the power sector. Objective data, information, and lessons learned about these generators are therefore needed to help members make informed decisions about whether or how to include RICE in their portfolios and/or offerings to customers.

The objective of the RICE Working Group is to provide a collaborative forum to share information and lessons learned for its members on RICE power plants and draw from EPRI's expertise in asset management to develop technical guides, tools, and benchmarking data, which may aid in overcoming certain asset reliability challenges.

EPRI researchers intend to develop:

- An ever-growing benchmarking database, which will include data on maintenance and reliability metrics and asset performance through surveys and other research; updated annually.
- An equipment troubleshooting guide, which will include failure locations (components), failure modes, degradation mechanisms, corrective actions, etc.
- A planned maintenance optimization resource for RICE units using EPRI's tool, Preventative Maintenance Basis Database (PMBD), to improve existing maintenance strategies.

Benefits

This project aims to improve the overall availability and reliability of RICE units and plans by establishing or improving current maintenance and reliability programs. The new maintenance and reliability program may also improve the life span of existing RICE units, while helping to prioritize those that may need to be replaced or overhauled in the future to meet demand of flexible operations and renewables. These combined efforts may help improve reliable operation and lower operations and maintenance costs, which could ultimately contribute to improved electricity reliability and affordability for customers.

Project Approach and Summary

1. Drive industry collaboration by sharing and combining best practices through surveying participants and researching current industry information.
2. Provide a foundation for technical guidance and field discussions by building on previous EPRI research related to RICE units and current expertise in asset management.
3. Leverage existing EPRI asset management tools to develop important foundational elements, such as FMEA tables and maintenance strategies.
4. Establish a RICE Unit Steering Committee to identify relevant technical topics and develop agendas for webcasts and in-person meetings throughout the year.

Deliverables

Funders will participate in prioritizing the deliverables below based on total funding:

- Troubleshooting Guidance using Failure Mode and Effects Analysis
- Multiple technical transfer webcasts and one in person conference (Location TBD)
- Preventative Maintenance Strategy in document format
- Asset Management benchmarking data (based on number of participants)

Price of Project

\$35,000 USD per funder. This project is eligible for self-directed funds (SDF) and tailored collaboration (TC) funding.

Project Status and Schedule

August 2023 – August 2025

Who Should Join

Owners and operators of RICE units and plants

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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