Supplemental Project Notice

ENABLING AUTOMATED DIAGNOSTICS USING KNOWLEDGE-BASED FAULT SIGNATURES

Enabling Automated Diagnostics

PROJECT HIGHLIGHTS

- Develop new knowledge-based fault signatures to assist knowledge transfer and improve reliability.
- Implement fault signatures supporting automated diagnostics to help maintain asset health, mitigate risk, and reduce costs associated with unplanned outages.
- Apply automated diagnostics to help enhance electricity reliability and affordability for the ultimate benefit of the public.

Background, Objectives, and New Learnings

Power generation is undergoing many changes, including a digital transformation to improve or adapt to a dynamic energy landscape. Leveraging data and digital tools can be a challenging undertaking but holds many measurable benefits. Common drivers include potentially reducing maintenance cost, improved asset reliability, operational improvements, workforce efficiency, and improved safety.

One of the more powerful and near-term data uses is to diagnose a fault or degradation of a component or piece of equipment. Advanced computational algorithms can identify two different datasets as being different. However, these advanced algorithms cannot determine the reason for the difference unless there is data to compare. Many utilities are using various software with variety of algorithms that can support equipment diagnostics. Each of these algorithms will have some common and a few unique fault information requirements to execute fault diagnostics.

This project is intended to be power generation fuel agnostic. The objective of this three-phase project is to enable the funder's existing diagnostic software to perform automated diagnostics using knowledge-based fault signatures. The phases of the project include:

1. Identify the unique fault signature requirements for the diagnostic software used by funder.
2. Develop and manually implement knowledge-based fault signatures.
3. Explore development of a script that can automate import of fault signatures in funder's diagnostic software.

New learnings could include:

1. Exploration of unique requirements of the funder's diagnostic software for knowledge-based fault signature implementation.
2. Development of new knowledge-based fault signatures based on participating funder's requirements.
3. Potentially verification and validation of existing fault signatures.

Benefits

Development of knowledge-based fault signatures can assist knowledge transfer that consequently provides support with workforce transition. Automating diagnostics by importing knowledge-based fault signatures into existing software represents advanced analysis capability and maturity within a monitoring and diagnostics (M&D) organization not currently realized in the utility industry.

Implementation of fault signatures for automated diagnostic could help energy companies maintain asset health, mitigate risk, and costs associated with unplanned outages. The implementation of automated diagnostics can ultimately benefit the public through improved electricity reliability and affordability.

Project Approach and Summary

In collaboration with the funder, the general approach for this project is as follows:

1. Identify the unique fault signature requirements for the diagnostic software used by funder.
2. Modify existing fault signatures or develop new fault signatures for manually implementing in funder's software.
3. Explore development of a script that can automate fault signature implementation in funder's diagnostic software.

Deliverables

Anticipated deliverables for this project:

- Phase I – A presentation summary of lesson learned.
- Phase II – Funder's diagnostic software-specific fault signatures for implementation and support for implementation of those fault signatures.
- Phase III – A script or a mechanism to automate import of software specific knowldege-based fault signatures into funder's diagnostic software.

Price of Project

The project will be executed in three phases. The decision to continue to the next phase will be decided at the end of each phase. The price for each phase will be based on each funder's individual requirements.

Phase I: Exploring unique requirements of the funder's diagnostic software for knowledge-based fault signature implementation. Pricing is based on scope and will range from $30,000 to $50,000 per funder for Phase 1.

Phase II: Development and Implementation of Knowledge-based Fault Signatures. Price – TBD

Phase III: Exploring Development of Script to automatically import EPRI's Knowledge-based fault signatures into Funder's diagnostic software. Price - TBD

Project Status and Schedule

The first phase of this project is expected to be completed within six months from the in-person kickoff meeting.

Depending on individual funders' requirements, the scope, price, and time to finish Phase II and III of this project will vary.

Who Should Join

The project is power generation fuel agnostic. All energy companies developing, utilizing, or expanding their monitoring and diagnostics programs may consider joining this supplemental project.

Contact Information

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

Technical Contact

Prayag Parikh at 704.595.2502 (pparikh@epri.com)

Additional Contacts

Michael Liebenow at 704.595.2324 (mliebenow@epri.com)

Susan Maley at 704.595.2780 (smaley@epri.com)

Product ID: 3002029143 **Project ID:** 1-119412 **April 2024**

EPRI

3420 Hillview Avenue, Palo Alto, California 94304-1338 USA • 800.313.3774 • 650.855.2121 • askepri@epri.com • www.epri.com