Supplemental Project Notice

HYDROGEN TO INFINITY: DEVELOPING A HYDROGEN GAS TRANSMISSION FACILITY

Joint Industry Partnership | Phase 1

The Hydrogen to Infinity Project

PROJECT HIGHLIGHTS

- Forms a joint industry partnership (JIP) to support development of a full-scale testing facility that seeks to increase understanding of long-term effects of hydrogen blending in high-pressure steel natural gas transmission pipelines.
- Supports development of a two-mile, standalone test loop with multiple bypass loops serving as test stations and represenstative of infrastructure operated by JIP funders.
- Prioritizes research objectives for integration into the design of the test loop and the research vision for tests to be conducted over the 10+ year life of the test facility.
- Drives early-stage industry collaboration to design a facility intended to close key knowledge gaps and that can serve as a test bed for industry.

Background, Objectives, and New Learnings

Currently there is a gap in operational data and understanding of the long-term effects of hydrogen blending on high-pressure natural gas steel transmission infrastructure. To help address this gap, EPRI is establishing a joint industry partnership (JIP) that will support development of the Hydrogen to Infinity full-scale testing facility (the H2∞ project) on a Pacific Gas and Electric (PG&E) site. The goal of the H2∞ project is to support pathways to lower the carbon footprint of natural gas networks and the cost of hydrogen as a fuel by determining the potential for safely transmitting hydrogen gas blends in existing infrastructure.

The H2∞ project is intended to function as a test bed for industry utilizing legacy components from JIP funders and/or components that represent much of the existing high-pressure natural gas transmission infrastructure in North America. To ensure the facility meets these objectives, EPRI intends to lead a JIP designed to seek industry input into the design and planning for future operation of the H2∞ project.

The objectives of the H2∞ project are to:

- Understand the long-term (10+ years) effects of blending hydrogen with natural gas in a test facility that represents much of the existing natural gas transmission pipeline infrastructure in North America.
- Identify the conditions or mitigation measures, if any, that would ensure 20% hydrogen blends will not pose added risk to the common carrier pipeline system.
- Improve understanding of the operational limits of existing natural gas transmission pipeline infrastructure when injecting hydrogen at blend rates up to and above 20%.

This project is expected to provide insight into designing a test facility and the research vision for evaluating large scale and long-term aspects of blending hydrogen in existing steel high-pressure gas transmission systems. The research to be conducted at this facility aims to address operations and maintenance, materials integrity, gas quality and measurement, fluid hydraulics, and safety aspects of hydrogen blending in natural gas transmission pipelines.

Benefits

This project supports pathways to lower the carbon footprint of natural gas networks and the cost of hydrogen as a fuel by determining whether hydrogen gas blends can be transmitted in existing infrastructure and the factors needed to safely do so. In addition to showcasing industry leadership, JIP funders may avoid or reduce the expense of self-performing similar demonstration projects. In the event a JIP funder wishes to construct a test facility, having access to the detailed analysis, plans and drawings provided by this project is expected to advance and accelerate those projects. Learnings from this project can help JIP funders and other stakeholders make more informed decisions about how to safely and effectively blend hydrogen in existing infrastructure and raise awareness of key risk areas.

Project Approach and Summary

EPRI will provide administrative oversight and strategic technical engagement to the JIP to support the design and operation of the H2∞ project. Phase 1 is the subject of this SPN and involves preparation of the FEED and Engineering Design Studies as well as development of the research vision for the H2∞ project. Future work may include the testing and operational phases of the H2∞ project (Phase 2).

1. EPRI will seek to ensure that the H2∞ project is designed to enable comprehensive demonstrations that provide critical data and information needed by JIP funders for making robust and technically sound operational and investment decisions regarding injection of hydrogen into natural gas transmission pipelines and infrastructure.

2. Project initiation and due diligence will be performed to gather input from stakeholders, obtain and clarify available information, identify key areas of risk, initiate planning activities, and propose workstream development.

3. CPUC Decision D.22-12-057 hydrogen blending demonstration requirements will be the design basis for the FEED and Engineering Design Studies.

4. An Infrastructure and Assets Inventory will be performed to document existing infrastructure and determine vintage assets to be incorporated into the test loop.

5. A decision-making protocol will be developed for key decisions and for ensuring equitable prioritization of research objectives amongst JIP Funders.

6. Input to and development of Phase 2 of the JIP will occur during procurement and commissioning of the H2∞ project.

Deliverables

The main deliverables from this project are the FEED and Engineering Design Studies for the H2∞ project, as well as development of strategic research priorities and the research vision for the H2∞ project. The format of deliverables will include meetings and/or written updates, design plans and drawings, written reports, and presentations.

Price of Project

The cost to each JIP funder is $160,000, with a minimum of 16 funders. This project is eligible for self-directed funds. While participation in Phase 1 does not carry a commitment to participate in Phase 2, access to Phase 2 results will require funding of Phase 1.

Project Status and Schedule

This project is expected to commence upon securing sufficient funding, as determined by EPRI and PG&E, with a targeted start in 2024. This project is expected to conclude upon commissioning of the H2∞ project.

Who Should Join

This project is intended to address the needs of providers and owners of natural gas infrastructure in North America, as well as energy companies seeking to utilize blends of natural gas and hydrogen.

Contact Information

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

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