THE NARRAGANSETT ELECTRIC COMPANY
RIPUC Docket No. 22-42-NG
In Re: Issuance of Advisory Opinion to Energy Facility Siting Board
Regarding Aquidneck Island Gas Reliability Project
Witness: Kirkwood

PRE-FILED DIRECT TESTIMONY

OF

BRIAN K. KIRKWOOD

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I. Introduction

Q. Please state your name and business address.

A. My name is Brian Kirkwood. My business address is 280 Melrose Street, Providence, Rhode Island 02907.

Q. By whom are you employed and in what position?

A. I am employed by The Narragansett Electric Company d/b/a Rhode Island Energy (the "Company") as the Manager of LNG.

Q. What are your responsibilities as the Manager of LNG?

A. In my role as the Manager of LNG, I oversee Liquefied Natural Gas ("LNG") Operations at the Company's facilities in Cumberland, Exeter, and Portsmouth.

Q. Please describe your education, training, and experience.

A. I hold a bachelor's degree in Marine Transportation from Massachusetts Maritime Academy. Currently, I am completing my master's degree in Construction Project Management from Worcester Polytechnic Institute. My LNG career began in 2009 when I began working on LNG tanker ships as a deck department trainee *(cadet)*. From 2010 through 2016, I worked on LNG tanker ships as a navigation officer while at sea and cargo operator when conducting terminal LNG loading or unloading operations. During my shipping career, I performed various LNG evolutions including ambient cargo tank

cool down, LNG loading, and LNG unloading operations. In 2016, I began working at National Grid as a Commercial Point LNG supervisor in Dorchester, Massachusetts to support a plant modernization project. I transferred to Cumberland LNG in 2019 as site supervisor. In 2021, I moved into a position in Pipeline Safety as a Lead Project Manager with National Grid until May 25, 2022, when PPL Rhode Island Holdings, LLC, a wholly owned indirect subsidiary of PPL, acquired 100 percent of the outstanding shares of common stock of the Company from National Grid USA, at which time I began working in my current position.

Q. Have you previously filed testimony or testified before the Rhode Island Public Utilities Commission?

A. No.

Q. Are you familiar with the Aquidneck Island Gas Reliability Project (the "Project")?

A. Yes. In my LNG roles, I participated in mobilizing and supervising the Old Mill Lane Portable LNG site.

Q. Are you familiar with Application and Siting Report dated April 2022 ("Siting Report") that were submitted to the Rhode Island Energy Facility Siting Board (the "Siting Board")?

A. Yes. I supported preparation of the Siting Report, particularly regarding Section 3, which

describes the Project.

II. Purpose and Structure of Testimony

Q. What is the purpose of your testimony in this proceeding?

A. In my testimony, I provide an overview of the LNG operations at the Old Mill Lane site.

Q. How is your testimony structured?

A. Section I is the Introduction. Section II presents the purpose and structure of my testimony. Section III presents an overview of LNG operations at the Old Mill Lane site. Section IV is the Conclusion.

III. Overview of LNG Operations

Q. Please describe the Company's LNG operations at the Old Mill Lane site.

A. The Company seasonally mobilizes LNG mobile storage and vaporization equipment to support Aquidneck Island as a backup (capacity vulnerability) or peak shaving (capacity constraint) portable LNG site. For the winter heating season, the site is mobilized in November to be operational for December 1st and is typically demobilized in April after the conclusion of the heating season. Mobilization has occurred outside the heating season to address capacity vulnerability during pipeline maintenance activities; the mobilization and demobilization process is similar to the winter season process.

The equipment typically consists of five LNG storage trailers, a high pressure LNG pump trailer, two glycol vaporizers, an odorant trailer, an emergency generator and an office trailer. The vaporizers convert the LNG from a liquid state to a gas state. The glycol vaporizer is a heater that transfers heat from the heated glycol water mixture to the cold LNG until the LNG undergoes a phase change and becomes gas. The glycol mixture is comprised of water to increase the freezing temperature when compared to water alone. The operation only uses one vaporizer, leaving the second as a redundant backup.

For the seasonal operation, the equipment is delivered, setup, and connected to the existing gas manifold. Once the equipment is connected, a third-party vendor delivers LNG to the site by truck and transfers it into the LNG storage trailers. While the equipment is in standby, the vaporizer periodically cycles on to maintain the glycol water mixture temperature at the desired setpoint. Then ensures that the vaporizer is ready to be used in the case of an outage. In addition, the storage trailers must occasionally be vented to maintain proper pressure. Trailers are vented via the boil-off gas ("BOG") manifold and requires a warm vaporizer to heat the cold BOG before being injected into the distribution system.

During the vaporization process, LNG flows from the storage tanks, to the high pressure LNG pump trailer and to the glycol vaporizer where it heated into a gas and injected into the gas manifold. The gas manifold is connected to the natural gas distribution system and has the vaporized gas odorized just before it is injected into the natural gas distribution system.

After the initial filling of the LNG storage vessels, additional LNG will be delivered onsite as needed to maintain onsite storage to be prepared for capacity vulnerability issues. A security guard is staffed continuously whenever LNG process equipment is onsite and makes routine security rounds. Anytime LNG is onsite a RI Energy operator is on shift to make routine checks of the equipment, monitor LNG inventory, and be ready to vaporize as required.

Q. Can the LNG be stored without the equipment being in standby?

A. Yes, but with the following operational limitations:

1. LNG can only be stored in specific equipment, designed to contain LNG. While being stored, LNG will boil at approximately -258°F at atmospheric pressure and generate boil-off gas ("BOG"). Storage vessels vary with maximum working pressures but will require operator intervention to relieve BOG before the fixed pressure relief valves operate. To relieve pressure, cold BOG (approximately -220°F) is sent through one of the heated vaporizers to warm the BOG gas to approximately +60°F before being injected into the recovery manifold and distribution piping. The other alternative would be venting directly to the atmosphere. To minimize greenhouse gas emissions, sending BOG through the recovery manifold is the preferred choice. This, however, requires a vaporizer to be warm while BOG is being heated via the vaporizer's glycol. Depending on the storage vessel insulation efficiency, atmospheric pressures, and initial temperature of LNG, relieving BOG is necessary every 2-7 days. LNG can be stored without a

vaporizer in a standby-like state, but all BOG will be required to be vented to atmosphere. This contributes to greenhouse gasses and introduces an unnecessary risk of vented gas potentially being ignited in the presence of an ignition source.

2. Keeping LNG onsite with all vaporization equipment off would increase the response time to vaporize for the equipment to heat up and become operational. Keeping the vaporization equipment off for any period of time that allows the equipment to cool to ambient temperature jeopardizes the reliability of the vaporization equipment by increasing the likelihood of water permeating into devices and moving parts becoming inoperable or restricted in their normal range of moment.

Q. How long would it take to mobilize the system from a cold start?

A. Mobilizing the system and all ancillary equipment would take approximately two weeks from having no equipment onsite, to staging, setting up, cooling down, filling LNG, and testing. Equipment would need to be kept locally to setup and become operational within two weeks.

Q. What is the risk of running from a cold start?

A. When equipment is left off for any extended period, there is risk of equipment having issues starting back up. Cold and wet weather can cause valves and regulators to become stuck or restricted in their normal range of motion. Burners and blowers can have ice accumulation during freezing conditions that can delay or inhibit startup. Any additional

preparation required to turn the equipment on decreases our ability to respond to an emergent issue and increases potential for customer outages.

Q. Please summarize the differences between running a peak shaving facility and a backup facility.

A. Both operations inject vaporized gas from LNG when system demands necessitate additional gas that is not available from the pipeline. A backup supply facility is intended to meet existing gas customer needs during a pipeline outage or reduced capacity. A peak shaver facility is generally designed to shave the peak off the gas demand. On days when gas needs cannot be fulfilled from existing pipeline supply, peak shavers will operate to meet the difference of available pipeline gas supply and actual gas customer needs. The Project at Old Mill Lane is intended to serve both purposes: a backup supply as a secondary source intended to address capacity vulnerability, and also peak shaving to address the capacity constraint to Aquidneck Island.

IV. Conclusion

Q. Does this complete your testimony?

A. Yes, it does.