June 22, 2018

Sent via Electronic Mail and U.S. Mail

Chairman Kevin J. McIntyre
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Safety Study of Algonquin Natural Gas Pipelines, Westchester County, New York

Dear Chairman McIntyre:

The New York State Department of Homeland Security and Emergency Services (DHSES), Department of Public Service (DPS), Department of Health (DOH), and the Department of Environmental Conservation (DEC) (collectively, the New York State Agencies) write to inform the Federal Energy Regulatory Commission (FERC) of a recently completed risk analysis addressing a portion of the Algonquin natural gas pipelines[1] located near the Indian Point Energy Center (IPEC) in Westchester County, and to urge FERC to take additional action. Based on the report, as well as the lack of complete information available to the New York State Agencies, FERC must engage in further investigation of and action to mitigate potential risks.

First and foremost, because the safety analyses relied upon by FERC when approving the Algonquin Incremental Market (AIM) project were based on current maximum operating pressures on the pipelines, FERC must not allow any additional gas capacity or increased pressure on these pipelines at this time. FERC cannot allow any additional capacity or increased pressure at least so long as IPEC remains in operation and spent fuel remains in pools and while questions remain about the safety analyses relied on by FERC or the Nuclear Regulatory Commission (NRC). Any additional gas capacity or increased pressure would also first require updated safety analyses reflecting such changes. The New York State Agencies commissioned the report by HDR Engineering, Inc. (HDR), which surveys the potential risks to the pipelines. The report concludes that the upcoming closure of IPEC's nuclear reactors and the removal of spent nuclear fuel from the spent fuel pools to on-site dry cask storage will reduce the risks related to a potential pipeline incident. However, given the information made available to HDR, ongoing public concern in the local communities, and the nature of the critical infrastructure involved, further review and action by FERC is necessary and must be done in an expeditious and transparent manner.

[1] The NYS DHSES-commissioned risk analysis reviewed three pipelines in the vicinity of IPEC that are owned by Algonquin Gas Transmission, LLC, a wholly-owned subsidiary of Enbridge, Inc. – two pipelines (26-inch diameter and 30-inch diameter) that have been in operation for many years, and the Algonquin Incremental Market (AIM) project, a 42-inch diameter pipeline approved by FERC in 2015. *See* Docket No. CP14-96-000, FERC Order Issuing Certificate and Approving Abandonment, issued March 3, 2015.

Additionally, as described more fully below, there are a number of additional questions that must be answered in the short-term to confirm FERC's conclusions that potential incidents on the Algonquin pipelines will not interfere with safe reactor operations and storage of spent fuel at IPEC.

A hard copy of the confidential report is being sent by U.S. mail. Since it discusses critical infrastructure and the risk profiles of collocated gas pipelines and nuclear power reactors, the New York State Agencies request that FERC protect the confidential nature of the document.

Although the report discusses various critical infrastructure components and should therefore remain confidential, the report's evaluations and conclusions build off certain publicly-available information, particularly with regard to various design characteristics of the IPEC facilities. Based on this limited design and locational information, there remain questions that need to be evaluated further by FERC and answers should be provided to the New York State Agencies in order to have a complete understanding of the existing risk profile of the pipeline segments near IPEC.

Recommendations for Additional Risk Reduction

The report identified areas of potential concern that should be used to inform appropriate regulatory activities designed to further reduce the risk profile during the remaining operating life of IPEC, the transfer of spent fuel to dry cask storage, and decommissioning activities. Based on these identified risks, we recommend the following:

- Given that previous safety assessments have been done based on currently approved operating pressures, FERC cannot allow any additional capacity or increased pressure on the three pipelines without at least conducting new safety assessments. During the remaining operating life of IPEC, including the transfer of spent fuel into dry cask storage, FERC cannot approve any applications for new capacity or increased pressures on the pipeline segments in close proximity to IPEC (including the 42-inch, 30-inch and 26-inch pipelines).
- DPS, which is delegated by the federal government to ensure compliance with federal gas pipeline safety standards, has already enhanced monitoring of the pipelines in the vicinity of IPEC. We recommend more regular communications between the pipeline owner, Enbridge, Inc., and Entergy on incident prevention activities and emergency preparedness. DPS is prepared to facilitate such coordination.
- FERC should require regular testing of Enbridge Inc.'s ability to remotely close valves on the 42-inch, 30-inch, and 26-inch pipelines in the vicinity of IPEC within 3 minutes of an event. This valve closure time was assumed by FERC when it approved the AIM pipeline, but it must be regularly confirmed for all three pipeline segments.
- Lastly, at some point after the reactors cease generating electricity, decommissioning and decontamination work will begin at the IPEC site. NRC and FERC must coordinate a review of Entergy's decommissioning plan when filed to determine potential impacts to the original Algonquin pipelines and the AIM pipeline. Given the heavy excavator work that will be part of decommissioning, FERC may need to require Enbridge, Inc. to temporarily cease gas operations during the decommissioning activities that may threaten the pipeline integrity.

The report noted the mitigation measures required by FERC as part of its approval of the AIM project (e.g., re-routing, pipeline materials, depth of burial, and concrete barrier positioned over pipeline) that reduce the risk profile of the new pipeline segment in the Village of Buchanan. But such mitigation measures

are not in place on the pre-existing 26-inch and 30-inch segments that run closer to the IPEC facilities. The safety analyses that have been done by the federal government with respect to these segments may not have been sufficiently thorough.

Questions Regarding Previous Safety and Risk Assessments

FERC must re-evaluate whether the NRC and Entergy analyses relied on by FERC during the review of the AIM project were sufficient. The NRC and Entergy analyses concluded that the IPEC reactors could safely shut down if there were a pipeline incident, but it may not have fully considered all necessary and appropriate factors. For example, FERC must assess whether the analyses fully considered the different design characteristics of the structures containing the reactors, as well as those that contain the spent fuel pools and substantial quantities of spent nuclear fuel. There are significant differences between the reactor containment structures and the spent fuel pool buildings. At a minimum, FERC should provide answers to the following questions in order to assess whether the relied-upon analyses were sufficient.

1. Were IPEC's spent fuel pools accounted for with respect to analyzing pipeline rupture hazards at the IPEC site, with respect to both the pre-existing pipelines and the new AIM pipeline segment?
2. NRC and Entergy apparently relied on a software tool known as "ALOHA" in conducting their analysis of potential gas pipeline risks to the IPEC facilities. But NRC Regulatory Guide (RG) 1.91, which speaks to risk analysis of pipeline and transportation explosions postulated to occur near nuclear power plants, does not list ALOHA as a referenced tool for such analysis. A NOAA evaluation characterizes ALOHA as a "compromise between accuracy and speed. . . . developed to quickly assist the responder" in an emergency.[2] In light of the different purposes of these analytical tools and frameworks:
    a. Has an RG 1.91 analysis ever been performed for the existing gas pipelines running through the IPEC site?
        i. Where is this analysis documented?
        ii. What were the results?
    b. Is it typical for the NRC to use ALOHA to model a natural gas plume prior to using the RG 1.91 equation? If so, what other nuclear sites has this been used for? Have federal agencies ever performed the RG 1.91 analysis for a site and NOT used the ALOHA model?
3. In the April 25, 2003 NRC "Review of Natural Gas Hazards" at IPEC, NRC Staff recommend one aspect of determining the probability of a vapor cloud explosion to be further evaluated by the NRC's Office of Nuclear Safety and Incident Response. It is not clear whether this evaluation was ever performed. Was this evaluation performed, and if so, when was it competed, and what were the results?
4. There was a 2008 hazards study performed on the existing pipelines at the IPEC site that was not made public. Is this analysis (and its conclusions) available for review by the New York State Agencies? At a minimum, there should be a summary available to review.
5. What were the seismic risk parameters that were applied to the pre-existing pipelines that traverse the IPEC site and what were the seismic risk parameters that were applied to the new AIM pipeline segment?

[2] https://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/response-tools/aloha.html

As discussed above, the answers to these questions are necessary to demonstrate the sufficiency of the analyses conducted by NRC and Entergy, and subsequently relied upon by FERC. The answers provided will help to determine the scope of the additional action and review that FERC must undertake.

Thus, while a number of factors have reduced overall risks on and near the IPEC site, several questions remain, as outlined above. These questions must be answered by FERC in order for the New York State Agencies and the public to fully assess the sufficiency of prior analyses. We trust you share our concern for public safety. We appreciate your anticipated response to provide more information to the New York State Agencies and the public, so that there is a more complete understanding of the existing risk profile of the pipelines in the vicinity of IPEC. We urge you to adopt our recommendations to further reduce risks of pipeline incidents near IPEC.

Please find attached a copy of the executive summary of the report. As stated above, the complete confidential report will be mailed to you under a separate cover by U.S. mail.

Sincerely,

John B. Rhodes
CEO
Department of Public Service

Roger Parrino
Commissioner
Division of Homeland Security and
Emergency Services

Howard Zucker, MD
Commissioner
Department of Health

Basil Seggos
Commissioner
Department of Environmental Conservation

cc: Howard Elliott, Administrator, Pipeline and Hazardous Materials Safety Administration
Kristine Svinicki, Chair, Nuclear Regulatory Commission

Attachment

Algonquin Incremental Market Pipeline Risk Analysis Report

Report #17-98

Executive Summary

Within the United States, there is a growing concern over the physical security of our critical infrastructure. Some of our most critical infrastructure includes infrastructure used to transport hazardous materials (specifically oil and gas products). The Pipeline and Hazardous Materials Safety Administration (PHMSA), a branch of the U.S. Department of Transportation (DOT), is responsible for developing and enforcing regulations for safe and reliable transportation of hazardous materials via interstate pipelines. However, PHMSA does not oversee the potential impact to other critical infrastructure (such as interstate highways, electric generation, water treatment, etc.) in the event of a "rupture" of a hazardous material pipeline.

SCOPE

Within the State of New York, the Algonquin Mainline of Spectra Energy Partners, LP (Spectra) included two pipelines (26-inch diameter and 30-inch diameter) which traverse approximately 46 miles from the New Jersey border near the Village of Hillburn in Rockland County to the Connecticut border near the Town of Southeast in Putnam County. Concern was raised to the State of New York over the Spectra Energy Algonquin Incremental Market (AIM) Pipeline, most notably the proximity of some of the AIM Project segments to Entergy's Indian Point Energy Center (IPEC) nuclear facility and the supporting Con Edison Buchanan Substation. The AIM Project is designed to generally replace existing 26-inch diameter Algonquin Mainline pipeline with a maximum allowable operating pressure (MAOP) of 674 pounds per square inch gage (psig) with a new 42-inch diameter pipeline with an MAOP of 850 psig. In New York, approximately 15¾ miles was replaced including 6¾ miles in Rockland County, ¾ mile of HDD under the Hudson River, 8¾ miles in Westchester County, and 1/10 mile in Putnam County. The existing 30-inch diameter pipeline will remain in operation and has an MAOP of 750 psig.

Within the State of New York, the AIM Project also included net increases in horsepower at two existing compressor stations. Two new natural gas turbines were installed at the existing Stony Point Compressor Station in Rockland County and one new natural gas turbine was installed at the Southeast Compressor Station in Putnam County. There were also modifications / improvements to three meter and regulating stations located along the alignment.

The 42-inch diameter pipeline generally replaced the 26-inch diameter pipeline in the same excavated ditch from which the 26-inch diameter pipeline was removed and was generally installed at a minimum depth of three feet from the top of the pipeline. Although the new 42-inch diameter pipeline was generally collocated (side-by-side) with the remaining 30-inch diameter pipeline, it departs from the 30-inch diameter pipeline at several locations. Most notably, several miles of new pipeline right-of-way was required at the Hudson River crossing where the new pipeline is now located about 3,000 feet south of the existing Hudson River crossings.

In the vicinity of the IPEC facility, the existing Algonquin Mainline System consists of one 26-inch diameter pipeline and one 30-inch diameter pipeline that are within approximately 100-200 feet from the IPEC security fence which marks the border of the IPEC security zone. Even after the AIM Project replacements are complete, both of these lines will remain in place and operational to maintain system redundancy for reliability reasons. The new 42-inch diameter AIM Pipeline is approximately 1,500 feet south of the IPEC security fence and approximately 300 feet from the Con Edison Buchanan Substation. Consultations between IPEC's owner and operator (Entergy Nuclear Northeast) and Spectra Energy led to the incorporation of additional design and installation enhancements along approximately 3,935 feet of the AIM Project pipeline where it would lie closest to the IPEC facility and the substation. These measures included using coated pipeline pipe that exceeds the most stringent U.S. DOT requirements, burying the pipeline a minimum depth of 4 feet from the top of the pipeline, the installation of two parallel sets of fiber-reinforced concrete slabs over the pipeline that would act as a physical barrier over the buried pipeline, and installing yellow warning tape above and below the concrete slabs.

There are risks associated with the AIM Project as there are with any of the approximately 3,100 miles of interstate natural gas pipelines and over 1,000 miles of petroleum pipelines within the State and other pipeline systems throughout the country. As most of the pipeline infrastructure is buried, the main source of risk is inadvertent damage due to third party digging / excavation, failure due to faulty welds or corrosion, or operator error. Aboveground facilities are most susceptible to possible physical damage due to accidents and natural disasters. Cyber threats and attacks on critical pipeline infrastructure are also of concern.

RISK ANALYSIS SUMMARY

The U.S. Department of Homeland Security defines critical infrastructure sectors that are considered so vital to the United States that their "incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof."[1] In order to evaluate the potential risk associated with the AIM Project relative to critical infrastructure in and around the pipeline segments, the DHSES commissioned a risk assessment of the AIM Pipeline segments within the State of New York and the existing Algonquin Mainline System infrastructure within the AIM Project area that will remain in service.

This risk assessment focused on the key risks of potential pipeline incidents and identified critical infrastructure that could be impacted. The goal of this assessment was to identify and prioritize the top risks and support preliminary response strategies for the State should critical infrastructure be affected.

The project objectives and details were researched including natural gas pipeline incident information in order to develop a working model of a risk register.

This assessment analysis identified and discussed 46 initial potential risks that could be categorized within the following eight failure types:

[1] USDHS, 2016

- Corrosion Failure;
- Equipment Failure;
- Excavation Damage;
- Incorrect Operations;
- Material Failure of Pipe or Weld;
- Natural Force Damage;
- Intentional Damage; and
- Other Outside Force Damage.

The risks were compiled into a risk register or database of risks. The risk discussion focused on the AIM Project within New York and the remaining adjacent Algonquin Mainline System infrastructure within the AIM Project area and how natural or man-made hazards would potentially result in a pipeline incident along any particular segment.

The top risks, including critical infrastructure risks, identified in the risk register associated with the AIM Pipeline and the existing Algonquin Mainline System adjacent to it are listed in decreasing order of the expected impact:

- River traffic or dredging damage to the existing 30-inch Algonquin Mainline pipeline and dual 24-inch diameter pipelines (not being replaced) in the Hudson River to the southwest of the IPEC facility. This will not be expected to impact the safe operation of the IPEC facility, but an underwater incident could have a long-term impact on the existing pipeline operations.

- Excavation damage by a third-party contractor for the existing 30-inch Algonquin Mainline pipeline (not being replaced) near the IPEC facility.

- Earthquake-related damage to the existing 30-inch Algonquin Mainline pipeline (not being replaced) near to the IPEC facility.

- Excavation damage by a third-party contractor at locations other than identified under Item 2 above.

- Sabotage by a disgruntled employee with specialized knowledge who intentionally damages the pipeline or manipulates controls.

- Corrosion to the exterior of the pipeline that leads to a rupture.

- The release of hazardous waste materials due to a pipeline incident with the proximity of 17 New York State regulated Hazardous Waste Generating facilities within 1 Potential Impact Radius (PIR) of the pipeline.

- Disruption of transit or passenger rail service on the two passenger rail lines within 1 PIR of the pipeline.

- Disruption of the freight rail service with one freight rail line within 1 PIR of the pipeline.

Three of the top four risks above are related to the existing Algonquin Mainline pipeline segments near the IPEC facility. However, none are expected to impact the safe operation of the IPEC facility. The Risk Analysis includes a review of publicly available information from Spectra Energy and the Nuclear Regulatory Commission (NRC). This review indicates that the IPEC facility was evaluated for certain design basis events. It also includes evidence that confirms that this safety risk analysis was performed to the satisfaction of the NRC.

Due to the agreement with IPEC's operator to close the facility, the risk profile of the IPEC facility under a shutdown condition was considered. The inherent risk associated with storage of spent fuel rods on site in the spent fuel pools will be maintained after the final shutdown of IP2 and IP3. As indicated in the full report and Appendix E, it was conservatively concluded that the risk profile of the post-shutdown IPEC facility with spent fuel rod storage relative to the new and existing AIM pipelines will likely not be meaningfully different from the risk profile of the IPEC's normal operating condition. However, it is assumed that the spent fuel rods will be transferred to dry cask storage for long term storage. Following completion of the transfer, it is likely that the risk profile will be reduced.

POTENTIAL CRITICAL INFRASTRUCTURE IMPACTS

Using Geographic Information Systems (GIS) analysis, existing State critical infrastructure near the new AIM Pipeline and the existing Algonquin Mainline System was evaluated. A site conceptual model of the project route was developed that includes the pipeline segments and identified critical infrastructure along the pipeline. The area of review for data gathering was defined by calculating a potential impact radius (PIR) from these components (based on an industry standard formula[2]) within which the potential pipe rupture and subsequent ignition of a natural gas pipeline could have significant impact on people or property based on the size of the pipeline and its associated MAOP (Stephens, 2000). In a general report on hazardous liquids and natural gas pipelines commissioned by the Pipeline and Hazardous Material Safety Administration (PHMSA), Oak Ridge National Laboratory (ORNL) determined a maximum tolerable level of thermal radiation and the potentially severe damage radius to buildings and humans for natural gas pipeline releases and combustion immediately following guillotine-type breaks[3]. As indicated in the ORNL Report, the thermal radiation effects are a function of heat flux intensity and exposure duration. Fire damage to buildings and personal property is considered potentially severe for all areas within 1.5 to 1.7 times the PIR because the heat flux produced by natural gas combustion immediately following the break equals or exceeds the severe damage threshold.

To be conservative, critical infrastructure elements were categorized and mapped at 1.0 and 1.5 PIR as well as within 2.0 times the calculated PIR distance for the various pipeline segments. GIS analysis was utilized to identify 20 specific categories of risk to critical

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[2] A Model For Sizing High Consequence Areas Associated With Natural Gas Pipelines, Mark J. Stephens, C-FER Technologies, C-FER Report 99068. October, 2000.

[3] Oak Ridge National Laboratory, Studies for the Requirements of Automatic and Remotely Controlled Shutoff Valves on Hazardous Liquids and Natural Gas Pipelines with Respect to Public and Environmental Safety, Report ORNL/TM-2012/411. October 31, 2012

infrastructure including 78 features such as population centers, railways, hazardous material centers and event sites crossing pipeline segments or within 1.0 PIR of pipeline segments. These risk categories were ranked and compared on the same scale as the initial assessment.

The top risks from these additional critical infrastructure items are:

- Incident within high density population center;
- Release of Hazardous Waste materials due to pipeline incident;
- Disruption in transit or passenger rail service due to a pipeline incident;
- Disruption in freight rail service due to a pipeline incident;
- Disruption to major telecommunication infrastructure from a pipeline incident;
- Incident impacts the Indian Point Evacuation Routes;
- Damage to an active Chemical Bulk Storage Facility;
- Disruption in water conveyance due to a pipeline incident;
- Dam impacted by a nearby pipeline incident; and
- Incident near outdoor event sites.

Benefit of This Risk Assessment to the State

The outcome of this risk assessment process was the development of a risk register that can be utilized by the responsible regulatory agencies within the State (primarily DHSES and DPS) in coordination with the pipeline owner to help manage the risk to critical infrastructure within the State. This risk register is intended to be a living document that can be used by the agencies to track and monitor the identified risks.

Additionally, the State can utilize the experience and results from this process in order to: (1) become more involved in the routing and siting process for new pipeline facilities; and (2) help pipeline operators prioritize their efforts for security and associated mitigation efforts.

CHAIRMAN Resource

From: Hallenbeck, Jodi (DPS) <Jodi.Hallenbeck@dps.ny.gov>
Sent: Friday, June 22, 2018 6:10 PM
To: 'kevin.mcintyre@ferc.gov'; 'anthony.pugliese@ferc.gov'; 'howard.elliott@dot.gov'; CHAIRMAN Resource
Cc: Rhodes, John (DPS); Seggos, Basil B (DEC); Zucker, Howard A (HEALTH); Parrino, Roger (DHSES); Congdon, Thomas (DPS); Denn, James (DPS)
Subject: [External_Sender] Letter to FERC Chair McIntyre re: Algonquin Gas Pipeline from NYS Commissioners
Attachments: ferc_ltr_nys_dhses_dps_dec_doh_algonquin pipeline_062218.pdf; AIM Pipeline Risk Analysis Executive Summary.pdf

Good evening –

Please see the attached letter and Executive Summary from New York State Commissioners from the Dept. of Public Service, Dept. of Environmental Conservation, Dept. of Health and Division of Homeland Security and Emergency Services.

Thank you.

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