

**Responses to the Questions and Comments Related to the  
August 12, 2022, Oak Ridge National Laboratory (ORNL) Report:  
“Updated Safety Review and Assessment of Natural Gas Transmission Pipelines  
Adjacent to the Indian Point Site”  
(ORNL/SR-2022/2558)**

On December 16, 2022, the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS) held a virtual information briefing to provide an overview of the ORNL Assessment and its findings. During this meeting, PHMSA committed to addressing the questions and comments raised at the briefing, as well as those received by e-mail, in writing, and to making the responses publicly available. PHMSA accepted questions and comments from Friday, December 16, 2022, through Friday, June 30, 2023. The comments/questions are in bold below—presented as they were submitted—followed by PHMSA’s responses. In some instances, PHMSA did its best to interpret the comments and questions in the context in which they were provided in order for PHMSA to provide a response.

**An attendee voiced concerns related to the time it took to release the Oak Ridge National Laboratory Report and the six-month time window to submit questions and comments when decommissioning at Indian Point is happening now.**

In July 2021, PHMSA received a letter from Senator Charles Schumer, Senator Kristen Gillibrand, and Representative Mondaire Jones stating, “In addition to our request for an independent, comprehensive analysis of the safety risks posed by the AIM project, we also ask that you reassess and review all past FERC, PHMSA, and NRC assessments related to the safety of the 26-inch and 30-inch pipeline nearby Indian’s Point Unit 3.” The letter additionally stated, “We ask that this review provides detailed information regarding potential impacts to spent fuel pools and the Independent Spent Fuel Storage Installation.”

In response to their request, PHMSA initiated an agreement with ORNL on August 10, 2021, to perform a new, independent study to evaluate the potential safety impact on the Indian Point Energy Center (Indian Point) if an Algonquin pipeline were to fail. The analysis included:

- Review of the Nuclear Regulatory Commission (NRC) Office of Inspector General (OIG) report.
- Review of PHMSA, FERC, and NRC assessments related to the safety of the 26-inch and 30-inch Algonquin pipelines.
- Analysis of the potential impact of the 42-inch AIM Project pipeline, the 26-inch and 30-inch lines, the spent fuel pools, and the Independent Spent Fuel Storage Installations.

PHMSA held a virtual meeting on December 16, 2022, to provide an overview of the ORNL Assessment and its findings to the public and provided time for the public to review the ORNL Assessment and ask questions about it. PHMSA has and continues to perform its pipeline safety oversight responsibilities on pipeline facilities operating throughout the United States, including the Algonquin Gas Transmission pipelines operating near Indian Point.

**Honestly, this is an insulting presentation.**

We appreciate the sensitive nature of the discussion, public concerns and fears, and the need for an opportunity for follow up questions. The ORNL Assessment is a technical report. The intent of the December 16, 2022, virtual meeting was to present an overview briefing of the ORNL Assessment and its findings to the public. During the virtual meeting, we wanted to make sure the public had the opportunity to ask questions and provide comments regarding the ORNL Assessment. OPS informed the public that if a question was overly technical, OPS would coordinate with ORNL to obtain clarification.

A copy of the ORNL Assessment, as well as the PowerPoint presentation from the virtual meeting, is available to the public at PHMSA's website at <https://www.phmsa.dot.gov/news/oak-ridge-national-laboratory-updated-pipeline-safety-review-indian-point-site>.

**When will the ORNL report be posted to the PHMSA website?**

The ORNL Assessment was posted to the PHMSA website on December 16, 2022.

**Is anyone from Enbridge on this call? Ref: December 16, 2022, PHMSA ORNL report briefing.**

PHMSA is not aware if anyone from Enbridge was on the December 16, 2022, "Overview Briefing: ORNL Report" virtual meeting. PHMSA did not request that Enbridge attend and did not record participants' attendance.

**Will PHMSA be going over these results with Enbridge and Holtec?**

PHMSA has transmitted the report to Enbridge and Holtec, for their review as they update their integrity management plans. We have also provided Enbridge with a copy of the NTSB's report on the 2019 Danville, KY incident to ensure they incorporate any applicable lessons from that event.

**How can citizens/groups submit their questions, comments, or concerns? What are the time limits?**

PHMSA accepted questions, comments, and concerns regarding the ORNL Assessment through Friday, June 30, 2023. Please direct any additional questions, comments, or concerns to [PHMSAPublicAffairs@dot.gov](mailto:PHMSAPublicAffairs@dot.gov).

**How about a meeting with NRC and PHMSA together to answer public questions?**

PHMSA has coordinated with the appropriate subject matter experts at relevant agencies to provide a response to questions posed by the public during the meeting and the subsequent six months. If there is sufficient need for an additional meeting, PHMSA is glad to engage with NRC, as appropriate.

**An attendee requested PHMSA answer all questions asked during the December 16, 2022, PHMSA presentation and to include those in the chat.**

PHMSA is responding to questions raised during the December 16, 2022, meeting as well as to those submitted to [PHMSAPublicAffairs@dot.gov](mailto:PHMSAPublicAffairs@dot.gov) through Friday, June 30, 2023. Responses are contained in this document and posted on the PHMSA website.

**An attendee asked who was invited to the presentation on the ORNL Assessment.**

PHMSA notified the following offices and agencies of the December 16, 2022, presentation: Senator Schumer, Senator Gillibrand, Representative Jones, New York State Department of Public Service (NYSDPS), NRC, NRC OIG, and FERC.

**Who funded the ORNL Risk Assessment? Were there any funds used by any industry entity or association in funding the ORNL report? If so, why doesn't this present a legal conflict of interests?**

PHMSA funded the ORNL Assessment. According to ORNL, no other organizations provided funding for the study. ORNL researchers are held to a high standard for reporting potential conflicts of interest, and we are not aware of any known or disclosed conflicts of interest among the team members for this study.

**Does PHMSA know of any financial relationship between Enbridge and ORNL, other funded studies?**

PHMSA is not aware of any financial relationships between Enbridge and ORNL. According to ORNL, ORNL is the Department of Energy's largest multi-program science lab, with a staff of more than 5,000 people. The team members for the Indian Point study were not involved in any situations that potentially involve a conflict of interest during the study. Additionally, as of this writing, there are no research projects at ORNL that are funded in whole or in part by Enbridge.

**Two questions received asked whether Enbridge, or any energy corporation, gas pipeline industry association, or industry trade groups, were involved in any aspect of the risk assessment data used.**

ORNL stated to PHMSA that their only contact with an outside organization to provide information for the ORNL study was with Richard Burrioni of Holtec Decommissioning International to confirm the backup generators associated with spent fuel pool cooling pumps were still in place and operational. This confirmation took place in August of 2022, after the ORNL study had been completed, and was undertaken to address a comment raised during peer review of the report. In other cases, ORNL made use of accessible materials, such as reports, publications, and articles from scientific literature. In these cases, the references for these materials are included in the report.

**What was the scope of the study? (Which pipelines, spent fuel, elementary school, decommissioning, etc.)**

The scope of the study is contained in the ORNL Assessment, chapter 1, section 1.1, *Scope of the Safety Review and Assessment*. The ORNL Assessment is available on the PHMSA website at <https://www.phmsa.dot.gov/news/oak-ridge-national-laboratory-updated-pipeline-safety-review-indian-point-site>.

**Who were the experts conducting this study? What credentials? Pipeline v. nuclear? Did this include an expert in modeling transient release dynamics for a gas pipeline rupture that models both ends of the release?**

The ORNL team consisted of those listed on the report, all of whom have advanced degrees and many years of experience in fields directly related to pipeline safety. Our team of experts included:

- A member who holds a B.S. and M.S. in mechanical engineering with a focus on thermal science; has more than 25 years of experience, including a focus on fuels and combustion; and is both a Licensed Professional Engineer and an elected Fellow of SAE International.
- A member who is a physicist with more than 43 years of combined experience in pipeline and nuclear reactor safety and has served as a program manager and safety analyst.
- A member who retired after a 32-year career as an ORNL staff member but continues to support ORNL's work as a consultant. This team member has a B.S. and an M.S. in civil engineering; is an expert in pipeline codes and standards, and pressure system safety; and has experience with NRC regulatory requirements for tornado and wind loads.
- A member who has B.S., M.S., and Ph.D. degrees in mechanical engineering; serves as the group leader for the Multiphysics Modeling and Flows group at ORNL; and has experience modeling nuclear facilities and previous pipeline accidents.
- A member who has a B.S. in Information and Computer Science, and an M.S. in Computer systems; and is a modeling expert with experience in hazard prediction.
- A member who recently joined ORNL after a career in the nuclear industry; has a B.S. and M.S. in nuclear engineering sciences; and held numerous engineering positions at River Bend Station, including fuel movement supervisor and lead licensing engineer.

**Please identify any independent experts who were used in this assessment.**

According to ORNL, the only participants in the ORNL study were the ORNL team members.

**What were named conflicts of interest?**

PHMSA reviewed and is not aware of any conflicts of interest for any member of the ORNL team, nor were any disclosed in the ORNL report.

**Was this study peer reviewed?**

Yes. Upon receipt of the draft report from ORNL, PHMSA requested FERC, NRC OIG, NRC, and NYSDPS review the document for accuracy. NRC and NYSDPS provided factual comments, and NRC OIG and FERC declined to review the report. All comments PHMSA received were relayed to ORNL for their consideration in keeping with their independent analysis and review.

**Why is FERC not participating? Is this typical?**

FERC was invited to review the report and was also invited to attend the event—as noted earlier, however, there was not an attendance tracker of all attendees. FERC is responsible for authorizing gas transmission pipeline construction and operation activities in the U.S.—PHMSA is responsible for setting and enforcing standards for the oversight of safe operations of hazardous pipelines. Questions related to FERC's jurisdiction can be directed to FERC's Office of External Affairs by phone at 866-208-3372, or by e-mail at [customer@ferc.gov](mailto:customer@ferc.gov).

**Who settled upon the conclusions of the study? The researchers or the DOT bureaucrats?**

PHMSA initiated an agreement with ORNL to perform a new, independent study to evaluate the potential safety impact on Indian Point if an Algonquin pipeline fails. The analysis included:

- Review of the NRC OIG report.
- Review of PHMSA, FERC, and NRC assessments related to the safety of the 26-inch and 30-inch Algonquin pipelines.
- Analysis of the potential impact of the 42-inch AIM Project pipeline, the 26-inch and 30-inch lines, the spent fuel pools, and the Independent Spent Fuel Storage Installations.

The analyses and conclusions of the report are those of the review team at ORNL. Neither PHMSA nor the pipeline operator were involved in conducting the analysis or reaching conclusions.

**When was the study completed and are we (assumed stakeholders in attendance at December 16th 1 p.m. EST meeting) the first to be briefed? Who else has known its results?**

The ORNL Assessment was completed on August 12, 2022. On December 16, 2022, PHMSA initially met with the offices of the elected officials that requested the analysis and subsequently members of the public to provide a high-level synopsis of the report and information on where to obtain a copy of the report. The report was also posted to the PHMSA website on December 16, 2022, following the meetings.

Prior to the release of the report on December 16, 2022, only ORNL and those agencies asked to peer review the report for factual accuracies (FERC, NRC OIG, NRC, and NYSDPS) had draft report information.

**Does this study constitute a federally compliant risk assessment as required by federal regulations 49 U.S.C. 60101 et seq. and 49 CFR 192.917, 935, 615, and 616?**

No. The ORNL Assessment is not intended to be, nor does it constitute, a federally compliant risk assessment as required by the federal pipeline safety regulations (PSRs). PHMSA initiated an agreement with ORNL to perform a new, independent study to evaluate the potential safety impact on Indian Point if an Algonquin pipeline were to fail.

Pipeline operators must perform the risk assessments identified in federal PSRs. PHMSA has Gas Transmission Pipeline Integrity Management regulations in 49 CFR Part 192 and NYSDPS, acting as PHMSA's interstate agent, inspects companies to verify compliance with the federal regulations. These regulations necessitate the minimum requirements for an integrity management program (IMP) for covered gas transmission pipelines. Per the regulations, operators must:

- Identify High Consequence Areas.
- Identify threats to each covered pipeline segment, which must include data integration and a risk assessment to perform a risk analysis.
- Evaluate and assess the pipelines on a regular schedule.
- Remediate conditions found during an integrity assessment.
- Implement preventative and mitigative measures for each covered segment.

PHMSA and NYSDPS perform regular inspections of operator Integrity Management Plans and the implementation of these plans. PHMSA issues enforcement actions for any identified probable violations. The “risk analysis” required by these regulations addresses pipeline risks, helps prioritize the schedule of pipeline assessments, and focuses efforts on measures that pipeline operators must take to prevent and mitigate the risks identified.

### **What action has been taken?**

PHMSA has transmitted the report to Enbridge and Holtec for their review and action, as appropriate. PHMSA and our state partners will continue to conduct inspections for compliance with Pipeline Safety Regulations—including applicable items raised in the report.

### **It was requested that information on PHMSA’s grants be shared.**

PHMSA offers comprehensive funding opportunities focused on hazardous materials and pipeline safety. PHMSA funding opportunities are designed to:

- Foster partnerships with states, local communities, universities, and nonprofits.
- Provide resources for emergency preparedness.
- Promote pipeline awareness campaigns.
- Develop pipeline resources.
- Implement best practices nationwide for pipeline and hazmat safety.
- Encourage the development of new technologies.
- Help municipality and community-owned utilities improve and maintain safe pipeline infrastructure.

All PHMSA grant applications can be submitted online at <http://www.grants.gov>. To apply, log-in or register with Grants.gov, find the proper funding opportunity, and submit your application. For more information on each funding opportunity, see <https://www.phmsa.dot.gov/about-phmsa/working-phmsa/grants>. Additional information on grant recipients is available here: <https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2022-11/PHMSA-FY2022-Hazardous-Materials-Grants-Report.pdf>.

### **Very important: Who on this ORNL team evaluated the AIM pipeline integrity management systems? Where are these reports? Is this federal regulation that this be done?**

The ORNL Assessment is a peer reviewed ORNL product. In this instance, ORNL reviewed the PHMSA and NYSDPS inspection records (provided by PHMSA) for the pipelines near the Indian Point site, and the results of these reviews are contained in the ORNL team’s report. Gas transmission pipeline integrity management requirements are available here: <https://www.ecfr.gov/current/title-49/subtitle-B/chapter-I/subchapter-D/part-192/subpart-O?toc=1>.

### **What assumptions were made in this study (blast radius, distance from spent fuel, impact of pipeline rupture on radioactive materials on-site, closure time of gas valves, etc.)?**

According to ORNL, these questions are central to its study and addressed thoroughly in the assessment. Please see chapter 4 of the ORNL Assessment for detailed answers to these questions: <https://www.phmsa.dot.gov/news/oak-ridge-national-laboratory-updated-pipeline-safety-review-indian-point-site>.

### **Does the ORNL report include risk probability statistics?**

The ORNL report was written primarily to examine the potential consequences of a hypothetical pipeline rupture on the Indian Point site, without regard to whether such a hypothetical rupture is likely or unlikely to occur.

Risk probability in the report included the risk of pipeline rupture per mile (derived from PHMSA's pipeline accident data) that was contained in the Report of the U.S. Nuclear Regulatory Commission Expert Evaluation Team.

### **The ORNL report repeatedly says things are “highly unlikely” or “unlikely”—what does that mean in real terms? Are these statistical terms or opinions?**

According to ORNL, the terms “highly unlikely” and “unlikely” represent the professional opinions of the review team; they are not statistical terms.

### **The consequences are so great, that even if it is an “improbable” event, it is tremendously risky. Unacceptably risky.**

The ORNL Assessment concluded that while an unintentional natural gas release and subsequent resulting ignition can pose a threat to public safety, including buildings, equipment, and people who cannot take cover, “it is improbable that an unintentional natural gas release from any of these three pipelines will cause physical damage that adversely affects the structural integrity of safety-related structures, systems, or components, or the leak tightness of spent fuel casks and class A, B, C, and GTCC waste containers at the Indian Point Site, including spent fuel in dry storage at the ISFSI (Independent Spent Fuel Storage Installation).”

The federal pipeline safety regulations were enacted to protect the public and the environment from the inherent risks of hazardous materials transportation by pipeline. PHMSA and its state agents continue to conduct inspections on Enbridge's plans, programs, procedures, records, and facilities to verify compliance with these regulations and applicable federal safety laws. Additionally, PHMSA continues to work on efforts, such as new rulemaking and research and development, to further advance pipeline safety on a daily basis—with the ultimate goal of zero incidents.

### **Does the ORNL report address the shutdown time for this pipeline?**

ORNL used the eight-minute value closure because it was reported by the pipeline operator as the time potentially needed to identify a rupture; confirm that valves need to be closed; and close the valves. For the purpose of the study, calculations were also conducted by examining longer valve closure times. ORNL used valve closure times of eight and 16 minutes to calculate the distances and time periods where damaging radiative heat fluxes could exist. The results indicate heat flux densities that could potentially damage safety-related structures and systems begin to recede immediately after the rupture (even before block valves can be closed) because the pressure in the pipeline begins to decrease. The damaging heat flux densities recede to less than



half of the potential impact radius (PIR) distance within about 30 minutes, whether the block valves are closed in this time or not. Therefore, increasing the valve closure time would not change the conclusion that these damaging heat flux densities do not persist long enough at sufficiently large distances to cause serious damage to the safety-related structures and systems at the Indian Point site. Please see chapter 4 of the report for more detail.

### **Why didn't PHMSA use the example of the Danville, Kentucky, valve closure?**

PHMSA did not dictate the study parameters; the ORNL Assessment was produced by the ORNL team. The distances at which radiative heat fluxes can damage concrete and steel structures begin to decrease even before valve closure can occur. The damaging heat fluxes do not persist long enough and far enough to cause damage to the safety-related structures on the Indian Point site. Please see chapter 4 of the report for more detail.

Additionally, while it would not have changed the findings, the ORNL Assessment was completed on Friday, August 12, 2022, two days before the Wednesday, September 14, 2022, release of the National Transportation Safety Board (NTSB) Pipeline Investigation Report NTSB/PIR-22/02 August 15, 2022, addressing the Danville, Kentucky incident.

The NTSB Pipeline Investigation Report NTSB/PIR-22/02 is available at <https://www.nts.gov/investigations/Pages/PLD19FR002.aspx>.

### **Does this apply to a gas pipeline rupture?**

According to ORNL, the analyses in the ORNL Assessment assume a worst-case scenario of a complete pipeline break with pressurized gas emerging from both sides of the break. A simultaneous complete break of both the 26-inch and 30-inch pipelines was also considered.

### **Were vapor clouds considered in this analysis?**

According to ORNL, the majority component of natural gas is methane that, like helium, is lighter than air. Thus, when compressed natural gas is released from a pipeline, it mixes into the surrounding air and begins to rise. A modeling exercise conducted using the Hazard Prediction and Assessment Capability (HPAC) model during the ORNL study estimated the size and path of the natural gas plume as it mixed into the atmosphere. (Please see chapter 4 of the ORNL report for details of the HPAC study.) The HPAC model results affirmed the tendency for the plume to mix with air and rise rather than remain near the ground.

### **Are the ORNL report findings about unauthorized incidents rather than deliberate attacks?**

According to ORNL, the focus of the ORNL Assessment was on accidental or unanticipated pipeline ruptures.

### **Would consequences of an intentional action to damage the pipeline be any different than unintentional? Note that the ORNL report carefully limits itself to unintentional conditions that result in failure.**

The outcome of an intentional action could produce a pipeline rupture with consequences comparable to those of an unintentional event discussed in the ORNL report.



### **Did this report consider cyber threats to the pipeline?**

No. The focus of the ORNL Assessment was on accidental or unanticipated pipeline ruptures. A cyberattack on a natural gas pipeline would constitute an act of sabotage and was beyond the scope of the study.

The Department of Homeland Security (DHS) Transportation Security Administration (TSA) would be the agency with most direct responsibility for preventing intentional harm to pipelines. PHMSA works closely with TSA/DHS to ensure cyber incidents do not impose safety risks to pipeline operations.

### **Why was there no assessment of the threat of cyberattack and ransomware and cybersecurity measures done with the AIM 42-inch pipeline? (Such as the Colonial Pipeline. Reference: <https://www.techtarget.com/whatis/feature/Colonial-Pipeline-hack-explained-Everything-you-need-to-know>.)**

The DHS TSA would be the agency with most direct responsibility for preventing cyberattacks. According to ORNL, the focus of the ORNL Assessment was on accidental or unanticipated pipeline ruptures—which would not be likely from a cyberattack, given the separation and redundancies in place to prevent cyberattacks from impacting operational control of pipeline systems. See, e.g., the Colonial cyber/ransomware attack.

### **Pipeline experts have talked about turbulence. Was this examined? By whom? This is the mixing of gas in the air that causes an explosion. They are not modeled well according to the pipeline expert.**

While the ORNL Assessment did not examine turbulence, ORNL acknowledged the modeling challenge of turbulent mixing of gas and provided additional information on the mixing of gas in air in response to this question.

It's important to note that mixing natural gas into air does not by itself cause or mean that an explosion will occur. Rapid mixing of natural gas into air can cause the formation of a flammable mixture in some—but not all—parts of the natural gas plume. As mixing continues, flammable regions of the mixture will continue to be diluted with air and eventually become non-flammable. The limits of flammability of natural gas in air are from approximately five percent to 15 percent. If there is less than five percent or more than 15 percent methane in region of the mixture, that region will not ignite. If a region with a methane concentration within the flammability limits exists and is ignited, it will deflagrate (burn).

Not all pipeline ruptures result in ignition of the natural gas that is released. Even though deflagrations can be rapid and can produce substantial amounts of heat, they do not produce a damaging pressure wave. Damaging pressure waves are produced by detonation (explosion) of the air/gas mixture.

Methane burns at a relatively slow velocity of approximately 0.44 m/s compared to the speed of sound at sea level of about 343 m/s. The low burning velocity of methane is a characteristic of the chemical reaction kinetics of the methane molecule. In order to cause a detonation and damaging pressure wave, methane flames need to be accelerated to near the speed of sound. This process is known as deflagration-to-detonation transition, or DDT. Acceleration can occur if the methane and air mixture is confined within a building or other structure; this situation is why we observe explosions in houses or building when there is a natural gas leak.

When the pipeline rupture occurs outside of a structure (unconfined), there may be obstacles nearby that can also cause the flame to accelerate, but this situation is uncommon. Although we cannot completely rule out the possibility of a DDT, we can say it is unlikely, particularly since methane tends to rise in the air due to buoyancy. As the methane rises, there is less likelihood for obstacles that could cause acceleration to be present. Experiments conducted in the 1970s and 1980s that attempted to sustain a detonation in an unconfined methane/air cloud required substantial use of high explosives to ignite the mixture, and even then, met with limited success. There is a greater likelihood that the methane will ignite and deflagrate, rather than experience a DDT. While a natural gas flash fire or jet fire from a ruptured pipeline is a very hazardous situation, it does not produce a travelling pressure wave like a detonation (or explosion) would. In such cases, the most serious hazard is the radiant heat from the fire. The distances and times where potentially damaging radiant heat fluxes exist were investigated in the ORNL Assessment.

**Did this report include an expert in modeling transient release dynamics for a gas pipeline rupture that models both ends of the release?**

Based on information provided by ORNL to PHMSA, the ORNL team included members with a diverse background and expertise, including with flow dynamics.

**Does this report include the National Transportation Safety Board recommendations to Enbridge after the Danville, Kentucky, rupture for their Integrity Management Systems?**

No. The NTSB report addressing the Danville, Kentucky, incident—Pipeline Investigation Report NTSB/PIR-22/02—was released on September 14, 2022, after ORNL completed its Assessment on August 12, 2022. However, PHMSA has provided Enbridge a copy of the NTSB recommendations for their review and action, as appropriate. As noted elsewhere, PHMSA and its state partners review operator integrity management plans to verify that the companies have a compliant integrity management plan.

**Given that pipeline fires last for hours, how did they determine “short duration?” Slide 12**

According to ORNL, calculations were completed to determine the distances at which radiant heat flux density levels capable of damaging concrete and steel structures could be experienced, and how long these heat flux densities were likely to persist at those distances. The results showed that the damaging heat flux densities would not be experienced for long enough at distances great enough to cause serious damage to safety-related systems and structures at the Indian Point site. Please see chapter 4 of the report for more details.

**What data was used to determine the fire endurance/blast resistance of spent fuel canisters?**

According to ORNL, federal regulations specify test conditions used to certify containers for radioactive materials. These test conditions can be found in Title 10 Code of Federal Regulations Part 71, specifically § 71.41 – § 71.77.

**Sandia National Laboratories’ evaluation concluded: “it will disperse within 1 minute and thus an explosion will occur during the first minute independent of release duration and thus uses a mass of 311,000 lbs for the TNT equivalency calculation. If the cloud is not**

**immediately buoyant, then for a 60-minute release using the total mass calculated by ALOHA the result in 8872 ft or 1.7 miles.”**

According to ORNL, the majority component of natural gas is methane that, like helium, is lighter than air. Thus, when compressed natural gas is released from a pipeline, it mixes into the surrounding air and begins to rise. A modeling exercise conducted using the HPAC model during the ORNL study estimated the size and path of the natural gas plume as it mixed into the atmosphere. (Please see chapter 4 of the ORNL report for details of the HPAC study, available at <https://www.phmsa.dot.gov/news/oak-ridge-national-laboratory-updated-pipeline-safety-review-indian-point-site>). The HPAC model results affirmed the tendency for the plume to mix with air and rise, rather than remain near the ground.

**Pipeline expert also said there are no really good tools to tell you actual impact zone. What did the ORNL technicians use for PIR and how did they arrive at that PIR? Were these PIR findings based on the devastation of the Danville, Kentucky, rupture?**

According to ORNL, PIR is a calculated radius at which a radiant heat flux density of 5,000 BTU/hr. ft<sup>2</sup> could be experienced. PIR is calculated using an equation,  $PIR = 0.685 * \sqrt{p \cdot d^2}$  where p is the pipeline maximum operating pressure and d is the pipeline diameter.

The ORNL study calculated PIR for the three pipelines so that the calculated PIR distance could be used in comparison to distances at which radiant heat flux densities that are capable of damaging concrete and steel structures may be experienced. As is shown in the report, heat flux densities that could damage safety-related systems and structures are contained to distances less than the PIR distance before block valve closure is likely to occur.

The ORNL heat flux density calculations assume that all the natural gas participates in the jet fire; this is a more conservative assumption than is contained in the PIR calculation because it results in the worst-case distances at which heat flux densities may be experienced.

The ORNL Assessment does not refer to the Danville, Kentucky incident, but changing the value of the PIR would not change the conclusions of the ORNL Assessment.

**The assessment reads, “The spent fuel pool building for Unit 3 is the closest building of particular concern; the Unit 3 containment building is further away from the pipelines. The point of closest approach for the 26 in. pipeline to the spent fuel pool building is approximately 620 ft. The point of closest approach for the 30 in. pipeline to this building is approximately 650 ft. These distances were established using the measure distance tool within the PHMSA National Pipeline Mapping System. These distances exceed the PIR distances for these pipelines and also exceed the distance at which the 100 kw/m<sup>2</sup> radiative heat flux is expected to exist.” Didn’t the PIR of the 30" pipeline in the Danville, Kentucky, rupture show this not to be true? What are the standards of the PHMSA National Pipeline Mapping System now—and what are they estimated to be in the future? The NTSB said the PIR for this pipeline rupture was 633 feet, which leaves a 17 ft differential in distance.**

**Okay, then later, the assessment cites 1.5 times the PIR distance here:**

**“Even in this case, the highest heat flux density of 100 kW/m<sup>2</sup> initially extends to approximately 1.5 times the PIR distance for the 30 in. pipeline. The highest heat flux**

**density of 500 kW/m<sup>2</sup> initially extends to just less than 0.75 times the PIR distance for the 30 in. pipeline.”**

**Why 0.75 times then? Really? Why not 1.5 times? Wouldn't this be safer calculation? How do these two separate calculations support (or contradict) each other?**

According to ORNL, the ORNL Assessment calculated the distances at which damaging heat flux densities could be experienced in the event of a jet fire following a pipeline rupture. As distance from the jet fire increases, the heat flux density decreases; as you move further away from the rupture, the potential for injury and damage decreases. PIR is a calculated radius at which a radiant heat flux density of 5,000 BTU/hr. ft<sup>2</sup> could be experienced. PIR is a function of both the pipeline diameter and its maximum allowable operating pressure. Not all 30-inch pipelines have the same PIR because they don't all have the same maximum operating pressure.

The distances at which potentially damaging heat flux densities can exist were calculated. These distances were then divided by the calculated PIR distance for comparison purposes and plotted as a function of time. These plots are included in chapter 4 of the report. The highest heat flux density of concern, 500 kW/m<sup>2</sup>, only extends to an initial distance of just less than 0.75 times the PIR distance, while the lower heat flux density of 100 kW/m<sup>2</sup> can initially exist to a larger distance of 1.5 times the PIR distance. The tendency for higher heat fluxes to be limited to lesser distance is as expected and is not contradictory.

**The NTSB cited PHMSA for underestimating the PIR. Why wasn't it increased for this risk assessment because of the high risk???**

Changing the value of the PIR would not change the overall conclusions of the ORNL Assessment.

PIR calculations are used to identify sections of pipeline that must comply with integrity management requirements. The segments in question are already covered by integrity management requirements, so changing how the PIR is calculated would not change the safety requirements for the pipeline. ORNL used the PIR distance in their assessment as a unit for comparing the distances at which differing radiant heat flux densities could occur, however, using a revised PIR distance would not impact the overall conclusions of the Assessment.

It is useful to note the NTSB report regarding the Danville, KY incident was completed on September 14, 2022, after ORNL completed its work on the ORNL Assessment. The NTSB Investigation Report NTSB/PIR-22/02 is available at <https://www.nts.gov/investigations/Pages/PLD19FR002.aspx>.

**In the meeting and presentation with Linda Daugherty, I believe I heard her say that the recommendations to PHMSA and Enbridge by the National Transportation Safety Board (NTSB), after the Danville, Kentucky, pipeline rupture in 2019, had been incorporated into this ORNL Risk Assessment. Was I mistaken in my understanding? (Right now, the PIR evaluations all seem to reference the New Mexico rupture example in 2000.) Why wouldn't PHMSA include the expanded PIR and recommendations from the NTSB?**

As noted above, changing the value of the PIR would not change the overall conclusions of the ORNL Assessment.

PIR calculations are used to identify sections of pipeline that must comply with integrity management requirements. The segments in question are already covered by integrity management requirements, so changing how the PIR is calculated would not change the safety requirements for the pipeline. ORNL used the PIR distance in their assessment as a unit for comparing the distances at which differing radiant heat flux densities could occur, however, using a revised PIR distance would not impact the overall conclusions of the Assessment.

It is useful to note the NTSB report regarding the Danville, KY incident was completed on September 14, 2022, after ORNL completed its work on the ORNL Assessment. The NTSB Investigation Report NTSB/PIR-22/02 is available at <https://www.nts.gov/investigations/Pages/PLD19FR002.aspx>.

**Have you corrected errors/shortcomings identified by NTSB in their investigation of Enbridge's Danville, Kentucky, pipeline rupture? Nonconservative assumptions used to calculate the potential impact radius, incomplete evaluation of the risks caused by a change of gas flow direction, limitations in data analysis related to in-line inspection tool usage, incomplete assessment of threats and threat interactions, and missed opportunities in training and requalification practices.**

PHMSA is researching appropriate PIR modifications and will, if appropriate, issue a rulemaking changing how PIRs are calculated. While it may seem counter-intuitive, changing the value of the PIR would not change the overall conclusions of the ORNL Assessment.

**Where can I find the recommendations of the NTSB to PHMSA and Enbridge? Why weren't the recommendations made by the NTSB part of the ORNL risk assessment of the Algonquin pipelines near Indian Point? Wouldn't a fault in Enbridge's integrity management systems put other pipelines at risk from other geohazards?**

PHMSA understands this question is related to the NTSB Investigation Report NTSB/PIR-22/02, August 15, 2022, in response to the Enbridge Inc. Natural Gas Transmission Pipeline Rupture and Fire that occurred in Danville, Kentucky, on August 1, 2019. NTSB's recommendations to PHMSA that were issued on September 14, 2022, can be found in the NTSB report, which is available at <https://www.nts.gov/investigations/Pages/PLD19FR002.aspx>.

Please see the response to the question above for additional information on the NTSB Recommendations to PHMSA and why these were not included in the ORNL Assessment, completed before NTSB issued its recommendations in September 2022.

PHMSA is working to address the three NTSB Recommendations issued to PHMSA: P-22-1, P-22-2, and P-22-3. PHMSA has provided Enbridge of a copy of the NTSB recommendations for their review and action, as appropriate. As noted elsewhere, PHMSA and its state partners review operator integrity management plans to verify that the companies have a compliant integrity management plan. PHMSA and NYSDPS—as the interstate agent for New York—perform regular audits of Enbridge's Integrity Management Program and the implementation of the program, and during these audits, will be verifying that Enbridge has performed a review and made appropriate program updates. For interstate pipelines, enforcement actions are initiated by PHMSA if probable violations are identified during these audits.

**Mr. Rick Kuprewicz transcript quote to NRC Eval Team March 2020: “The fireballs generate so much thermal flux. I’ve seen it liquefy aluminum or vaporize aluminum and liquefy steel. It’s hotter than hell....Well, that radiation doesn’t dissipate a whole lot with distance.”**

PHMSA has seen, documented, and taken mitigative action in numerous cases, in response to thermal flux impacts—and is currently undertaking actions in response to the NTSB report regarding the Danville incident as well.

**Rick Kuprewicz in interview transcript from NRC OIG Eval Team (March 2020): “They got to follow the laws of science. And the laws of thermodynamics are the controlling factor. And so the line is going to burn for quite some time but the massive heat flux, with possible explosions and high thermal radiation. The laws of thermodynamics are going to release at the speed of sound in the gas.”**

The ORNL report reviewed the NRC and OIG team’s assessment as part of this report—including worst cases scenarios—involving myriad factors including thermal radiation and explosions.

#### **Pipeline Questions from Rick Kuprewicz.**

Mr. Kuprewicz has provided analysis for PHMSA in the past and we welcome his insights here as always.

**Assessment reads: “Packaging designed to contain radioactive wastes from the decommissioning of the plant are designed to withstand thermal loads. For example, class B, C, GTCC, and dry storage casks are subjected to fires at 1475 °F for 30 minutes as a part of their certification process.”**

**What happens if the thermal load is longer than 30 minutes? Does this mean, that let’s say, if the casks are sustaining burning jet fuel longer than 30 minutes, would the casks melt? (The burning jet fuel of the airplanes that hit the World Trade Center melted steel after burning 2.5 hours is why I’m asking.)**

According to ORNL, packaging for radioactive materials that is subject to the fire test is expected to retain its integrity and ability to contain the waste material after 30 minutes of exposure. The scope of this study focused on the question of whether these containers might be damaged by the radiative heat flux from a pipeline fire.

**Which brings up another question: How long would it take for the thermal heat to reduce to a point where humans could approach the area?**

Figures 4.3 and 4.4 in chapter 4 of the ORNL Assessment show this information. Each of these figures contains a purple-colored curve for a radiant heat flux density of 1.42 kW/m<sup>2</sup>. This radiant heat flux density is considered safe for unprotected approach.

**Why weren’t relevant geohazards for the AIM Pipelines at Indian Point included in the ORNL risk assessment?**

According to ORNL, the ORNL Assessment focused on investigating the worst-case potential outcomes in the event of a pipeline rupture that could impact the Indian Point site. The addition



of geohazards may impact the likelihood of a rupture but doesn't make the potential outcomes of a rupture worse.

**Moreso, if Enbridge is in compliance with all the safety recommendations that come from severe, life-threatening accidents around the country with their pipelines, why aren't preventative safety measures Enbridge has taken for the AIM Pipelines at Indian Point cited in the ORNL Risk Assessment?**

ORNL stated that PHMSA inspection records show that the pipelines near Indian Point are in compliance with applicable federal pipeline safety regulations.

Enbridge is required to follow all applicable pipeline safety laws and regulations. PHMSA and NYSDPS will continue to conduct inspections and other safety compliance and enforcement activities in accordance with applicable pipeline safety laws and regulations.

**The assessment reads: "Inspection, testing, and repair specifications and procedures for pipeline projects including construction, procurement, and inspection for the Algonquin Gas Transmission pipeline are identified and described in (Entergy Nuclear 2020), Appendix B, Exhibit A." Why and how did Entergy, a nuclear power plant corporation, determine this? Why wouldn't this agency evaluation be done by PHMSA who has the expertise in pipelines? Who sets the standards and evaluation of Integrity Management Systems of the AIM Pipelines, is it this Entergy? PLEASE answer this question, why this is Entergy. Is this federal regulation?**

According to ORNL, the referenced exhibit is a summary of documents developed by Spectra but included in an Entergy document because they related to the risk of fire associated with a rupture of the new 42-inch pipeline near the Indian Point site. Since the Entergy report contained a concise list of procedures and requirements, it was used as a reference.

Enbridge is required to follow all applicable pipeline safety laws and regulations. PHMSA and NYSDPS will continue to conduct inspections and other safety compliance and enforcement activities in accordance with applicable pipeline safety laws and regulations.

**Did the ORNL report take into account whistleblower reports that pipeline segments were buried before welds were inspected during construction of the AIM Pipeline expansion? Does that alter the risk?**

According to ORNL, their assessment focused on investigating worst-case potential outcomes that could impact the Indian Point site in the event of a pipeline rupture—not necessarily every potential cause of a rupture.

Reports of inadequate pipeline inspection during construction are serious matters that fall within PHMSA or NYSDPS purview to investigate. Since the ORNL study investigated the worst-case outcomes possible from a pipeline rupture (regardless of the cause or likelihood of the rupture), any whistleblower allegations would not change the conclusions of the ORNL review.

**The following questions should be clearly stated and addressed in any competent risk assessment ("RA") for the nuke facility decommissioning effort and the nearby pipelines.**

**I. Pipeline Locations and depth: Define the pipe type (e.g., ERW, DSAW, etc.), diameter, pipe grade, pipe thickness, MAOP, and year of installation in the ROWs that might be**

affected by the nuke decommissioning activities. Clear indication on aerial map for the RA the two pipeline ROWs (North and South routes). Within each of the ROWs identify the approximately lateral location of the pipelines in the ROWs. The depth to upper surface of each pipeline running across the indicated ROWs. Clearly indicate how the pipeline(s) location (surface lateral and depth) was determined within the ROWs at threat to decommissioning activity (i.e., electronic measurement, potholing, depth of cover probes, and/or mapping ILI inspection pig runs, and the year of last location determination. Identify the expected soil type over each pipeline. State and calculate the maximum surface loading threat in pounds crossing the pipelines. Provide the surface loading calculations for each of the above pipelines incorporating an additional safety margin (such as 50%) and the appropriate surface plate steel thickness and dimensions that will satisfactorily disperse the maximum surface load on the buried pipelines. Clearly identify the last smart pig ILI runs (state the year run), and whether any anomalies were identified (such as general corrosion) on the pipelines within the threatened ROWS that might weaken the pipelines for surface loading threats.

**II. Spent fuel rod storage:** The RA should clearly demonstrate how far is the spent rod storage facility from the pipelines. The risk assessment should confirm that minimum water depth in the spent fuel rods storage as I believe this is a critical factor for this facility should a gas pipeline rupture.

According to ORNL, their assessment focused on investigating the worst-case potential outcomes in the event of a pipeline rupture that could impact the Indian Point site. Diagrams of the pipeline rights-of-way and distances from the pipelines to relevant structures on the site are included in the report. A discussion of the amount of time available to address spent fuel pool cooling in the event of a power disruption is also addressed. Discussions of threats to the integrity of the pipelines are also included. Threats to pipeline integrity influence the likelihood of a rupture, but do not change the worst-case outcomes in the event of a rupture.

**§192.935 What additional preventive and mitigative measures must an operator take? Operators must conduct risk assessments to identify additional preventive and mitigative measures to protect high consequence areas and enhance public safety. Such additional measures include but are not limited to 1) Installing Automatic Shut-Off Valves or Remote-Control Valves. 2) Installing computerized monitoring and leak detection systems. 3) Replacing segments with heavier wall pipe. 4) Additional training. 5) Conducting drills with local emergency responders. 6) Implement additional inspections and maintenance programs. 7) Enhancements to damage prevention programs. I don't see any of these examples referenced in the ORNL Risk Assessment that these measures were ever taken. However, I did find the following reference. Are these procedures meant to replace the above recommendations? "NOTE: Preventive maintenance activities for the Algonquin Gas Transmission pipeline involve a twice-weekly aerial survey, a twice-yearly foot patrol with leak survey equipment, a monthly vehicle patrol, and weekly inspection of cathodic protection. (U.S. Nuclear Regulatory Commission Expert Evaluation Team 2020)"**

Since the ORNL assessment focused on investigating the worst-case potential outcomes in the event of a pipeline rupture that could impact the Indian Point site, it was not necessary for ORNL to reference preventative and mitigative measures taken by the operator—which are typically the subject of Congress' periodic reauthorization of PHMSA's roles and responsibilities (most

recently enacted in the 2020 PIPES Act--and currently pending before Congress). Since that time, PHMSA has enacted new regulations to strengthen interstate natural gas pipeline safety requirements.

Enbridge is required to follow all applicable pipeline safety regulations. PHMSA and its interstate agent, NYSDPS, evaluate Enbridge compliance with these regulations and initiate enforcement action if probable violations are identified.

**Does it consider the excavation activities not just spent fuel storage?**

PHMSA understands that this question may be asking about the potential for excavation activities at the Indian Point site to cause a rupture to one of the pipelines. This is a risk to pipeline integrity that is addressed in the discussion of threats to the integrity of the pipelines contained in the ORNL Assessment. Based on information provided by ORNL, the ORNL Assessment investigated the potential worst-case outcomes in the event that a rupture does occur, regardless of its cause. Damage caused through excavation does not change the potential worst-case outcomes of a rupture—nevertheless, excavation damage is a focus area of PHMSA, which has numerous requirements for pipeline operators to follow to prevent inadvertent excavation damage.

**Industry standard question: What about “the stable-weld theory,” what study covers this, and was this used in this risk assessment? The Interstate Natural Gas Association funded one of the studies that said that the welds weren’t responsible for the San Bruno rupture and blamed a nearby sewer project, when other pipeline experts said it was the welds—this is why I am asking this question.**

In an effort to better understand your question and the reference to “the stable-weld theory,” PHMSA contacted the Interstate Natural Gas Association of America (INGAA). INGAA stated that they were not aware of a “stable-weld theory” study. PHMSA is also unaware of this theory; but welcomes any follow up on the subject.

**Where could I find (Entergy Nuclear 2020), Appendix B, Exhibit B referred to in the report?**

This document is available on the NRC website at <https://www.nrc.gov/docs/ML2026/ML20260H072.pdf>.

**Compare and contrast these findings with Rick K/Paul Blanch Accufacts safety analysis of Spectra/Entergy FERC filings, NYS commissioned HDR study, NRC OIG review of AIM Pipeline approval, Sandia Labs study from NRC response to OIG investigation. i.e., vapor cloud engulfing entire site in 8 min.**

According to ORNL, it isn’t possible to compare and contrast multiple reports in a short-answer format such as this one. Please read the ORNL report for more information about the methods of analysis and conclusions—which aimed, precisely, to serve as an independent analysis and considered the previous analyses, with additional insights and expertise from ORNL experts and their peer reviewers.

**Before it was built or anytime in the past 50 years! Those pipelines have been there under the nuke plant since long before the AIM Expansion.**

These three pipelines—and the rights-of-way in which these pipelines are located—are outside of the Indian Point security owner-controlled area. The ORNL Assessment contains diagrams of the pipeline rights-of-way and distances from the pipelines to relevant structures on the Indian Point site. These underground natural gas pipeline facilities have crossed part of the Indian Point site since the 1950s, prior to Indian Point. The 26-inch line was constructed beginning in 1952, and a 30-inch pipeline was constructed between 1965 and 1967. The 42-inch pipeline was installed in 2017, after the Indian Point reactor units were operational.

**But the pipeline is UNDER the nuclear facility!!**

While Algonquin Gas Transmission pipelines traverse the Indian Point site, all three pipelines, and rights-of-way in which these pipelines are located, are outside of the Indian Point security owner-controlled area. The ORNL Assessment contains diagrams of the pipeline rights-of-way and distances from the pipelines to relevant structures on the Indian Point site.

Underground natural gas pipelines have crossed part of the Indian Point site since the 1950s, prior to Indian Point. The 26-inch line was constructed beginning in 1952, and a 30-inch pipeline was constructed between 1965 and 1967. The 42-inch pipeline was installed in 2017, after the Indian Point reactor units were operational.

**There are the concrete pads that Enbridge put in place, that Rick Kuprewicz said were not valid safety measures and could become such missiles. Nobody listened.**

The ORNL Assessment focused on investigating the worst-case potential outcomes in the event of a pipeline rupture—including the potential for impact from missile projectiles (“...these containers are not expected to sustain serious damage from missiles during a postulated pipeline rupture event.”), including pavement fragments.

**None of these agencies ensured factual accuracy the first time around. Why were they left to do the fact checking? i.e.—the 3min shut down time, the use of ALOHA to model the rupture, etc. We are here because these agencies weren’t rigorous or were actively avoiding proper assessment of risk.**

PHMSA does not have authority to approve projects, issue permits, or prescribe location or routing of pipeline facilities. However, if a pipeline is approved, PHMSA and our state partners, such as NYSDPS, work to ensure that pipeline facilities are designed, constructed, operated, and maintained in compliance with the federal pipeline safety laws and regulations. Of the 3.4 million miles of pipelines in the country, these particular pipes have seen much greater scrutiny from our coordinated federal agencies. In response to requests from elected representatives and the public, PHMSA undertook this independent assessment to further review our coordinated agencies’ reviews and encouraged peer review of the review.

**It is VERY worrisome if it’s up to the public to make sure that oversight is rigorous for the only transmission pipeline system in the nation that is under a nuclear plant. Meg Glander (Schumer) Geri (Gillibrand) take note.**

PHMSA’s mission is to protect people and the environment by advancing the safe transportation of energy and other hazardous materials. As part of this mission, PHMSA administers a national regulatory safety program for approximately 3.4 million miles of interstate and intrastate pipelines in the United States. This program requires that pipeline operators design, construct,

operate, and maintain their pipeline facilities in compliance with the federal pipeline safety regulations.

The three pipelines—and rights-of-way in which these pipelines are located—are outside of the Indian Point security owner-controlled area. The ORNL Assessment contains diagrams of the pipeline rights-of-way and distances from the pipelines to relevant structures on the Indian Point site.

PHMSA and NYSDPS will continue to closely monitor, the safety of the Algonquin Gas Transmission pipelines near Indian Point, as well as the other natural gas transmission facilities located in New York, in accordance with our oversight responsibilities—which are also closely monitored by our elected representatives in Congress.

**Next, per the recommendation of Pipeline Safety expert Rick Kuprewicz, I am reading the ORNL Risk Assessment to also understand how Enbridge can make the pipelines safer for our community during decommissioning. Also, our community deserves to understand the baseline ways PHMSA holds Enbridge accountable for safety in its operating procedures.**

PHMSA initiated the agreement with ORNL to perform a new, independent study to evaluate the potential safety impact on the Indian Point site if an Algonquin pipeline were to fail. This action is in addition to PHMSA, and the NYSDPS' oversight, inspection and enforcement applied to these and other pipelines.

While PHMSA continues to have increasing responsibility over our nation's growing energy transportation system, PHMSA remains focused on enforcement and compliance and the development of new regulations to ensure safety and environmental mitigation. See, e.g. this [2021 rule](#) that expanded PHMSA's jurisdiction of nearly 400,000 miles of previously unregulated pipelines; this [2022 rule](#) to expand requirements for nearly 300,000 miles of natural gas transmission pipelines; this [2022 rule](#) that applies to nearly all transmission pipelines; and this [new proposed rule](#) that applies to more than 2.7 million miles of pipeline facilities. For further information on PHMSA's oversight role and enforcement activities, please see testimony before the House of Representatives in 2023, which underscore PHMSA's record breaking years for enforcement in 2021 and 2022:

<https://transportation.house.gov/calendar/eventsingle.aspx?EventID=406183>

**What is PHMSA's position then that Spectra AIM pipelines were approved with a 3-minute valve closure time? Why wouldn't PHMSA order a corrective action order to make the pipeline company comply with a standard of their agreement in making it operational? Wouldn't FERC object to this? How and when did the 3-minute shut-off requirement change? Do these new regulations for pipelines "just happen?"**

PHMSA's authorities are set forth in the Pipeline Safety Act codified at 49 U.S.C. § 60101, et seq. In all instances related to its role, PHMSA is bound by the laws established by Congress that provide our Agency its authorities.

PHMSA, pursuant to its authorizing statute, has no oversight over the siting or permitting of pipelines and does not give approval for pipeline operation. FERC determines where an interstate natural gas transmission pipeline can be located and built through their certificate processes and authorizes construction and operation. PHMSA does not evaluate or enforce compliance with their certificate.

When the AIM 42-inch pipeline was constructed, the federal pipeline safety regulations did not contain any regulatory requirements that specified a maximum time to close valves. The Report of the U.S. Nuclear Regulatory Commission Expert Evaluation Team on Concerns Pertaining to Gas Transmission Lines Near the Indian Point Nuclear Power Plant, April 8, 2020, includes information on isolation of a pipeline rupture.

Specifically, Section 2.1.3 Isolation of a Pipeline Rupture states, “Based on tabletop training and operating experience, Enbridge estimated that it would likely take 3 to 8 minutes to identify a rupture using the SCADA system, confirm that the valves need to be closed, and close the valves. Enbridge noted that the 3 minutes (previously referenced by Entergy) would be a “best-case” scenario. The team confirmed with the New York State Department of Public Service, which has inspection authority for the pipeline, that state inspectors observed remote operation of the valves that would isolate the pipelines near Indian Point on three occasions in 2018 and 2019. From the time the controller in Houston indicated the closure, the valve took about 30 seconds to close. The inspectors witnessed this both from the Houston control room and at the valve location near Indian Point and did not identify any issues.”

Rulemaking is the policy-making process for executive and independent agencies of the federal government. The process is governed by laws including but not limited to the Administrative Procedure Act, Congressional Review Act, Paperwork Reduction Act, and Regulatory Flexibility Act, and can lead to a new Rule, an amendment to an existing Rule, or the repeal of an existing Rule. Executive Orders such as 12866, 13563, and 13579 also establish principles and guidance for the rulemaking process.

More information about the rulemaking process is available at <https://www.reginfo.gov/public/jsp/Utilities/faq.jsp>.

**The Department of Transportation has the authority to shut down the gas using a Corrective Action Order and we know that the assumptions that were made when it was approved were based on false information. Issue a CAO and shut down the pipelines! Keep us safe!**

PHMSA’s authorities are set forth in the Pipeline Safety Act codified at 49 U.S.C. § 60101, et seq. In all instances, PHMSA’s role is bound by the laws established by Congress that provide our Agency its authorities.

PHMSA, pursuant to its authorizing statute, has no oversight over the siting or permitting of pipelines, and does not give approval for pipeline operation. FERC determines where an interstate gas pipeline can be located and built through their certificate processes and authorizes construction and operation. PHMSA does not evaluate or enforce compliance with their certificate.

Under the Pipeline Safety Act, 49 U.S.C. § 60112, after providing advance notice to a pipeline operator and providing an opportunity for an administrative hearing to consider the operator’s information and evidence, PHMSA may decide a pipeline facility is or would be hazardous to life, property, or the environment, and issue a CAO requiring the operator to take specific corrective actions. When assessing whether a facility is hazardous, PHMSA must consider factors such as the age, manufacture, and physical properties of the pipe; nature of the material transported; aspects of the area in which the pipeline facility is located; proximity to environmentally sensitive areas; and population density. If PHMSA further determines that



failure to issue the order expeditiously will likely result in serious harm to life, property, or the environment, PHMSA may waive the requirements for notice and an opportunity for a hearing and issue the order expeditiously, providing an opportunity for a hearing with the pipeline operator as soon as practicable after the order is issued. A CAO may require the operator to perform certain actions, including suspending or restricting the use of a pipeline, physical inspection, testing, repair, replacement, or other appropriate action. Operators may seek judicial or administrative review of a CAO—and have in the past—if they believe that issuance was not properly based on there being a hazardous condition or likely serious imminent harm. Once an operator has completed the terms of a CAO and PHMSA determines the facility is no longer hazardous, PHMSA must terminate the order and thereby remove any temporary restrictions on the use of the facility.

Presently, PHMSA is not aware of any condition that indicates these pipeline facilities are or would be imminently hazardous to life, property, or the environment, and warrant issuance of an administrative order that meets the legal threshold for suspending or restricting use of these facilities under 49 U.S.C. § 60112.

**Listening is one thing and responding is another thing. We have been raising these life and death issues for 9 years like 1.**

PHMSA's authorities are set forth in the Pipeline Safety Act codified at 49 U.S.C. § 60101, et seq. In all instances, PHMSA's role is bound by the laws established by Congress that provide our Agency its authorities.

In response to a request by Senator Schumer, Senator Gillibrand, and Representative Jones for an independent comprehensive analysis, PHMSA commissioned ORNL to perform this safety review and assessment.

While recognizing it may not be able to provide the answers some stakeholders wanted to hear, PHMSA met with the public on two occasions; established a six-month period to receive questions; and is answering all questions received.

PHMSA and NYSDPS continue their safety regulatory oversight over the pipeline facilities that operate near Indian Point, and Enbridge is required to comply with all applicable pipeline safety laws and regulations.

**The only way to make sure methane from pipelines isn't impacting climate change is to stop permitting gas pipelines.**

PHMSA does not have statutory authority from Congress to approve projects, issue permits, or prescribe location or routing of pipeline facilities. If a pipeline is approved, PHMSA and our state partners work to ensure that pipeline facilities are designed, constructed, operated, and maintained in compliance with the federal pipeline safety regulations.

**Does the new rulemaking on remote/automatic valves apply to the OLD pipelines? Those were removed.**

The new rulemaking—Pipeline Safety: Requirement of Valve Installation and Minimum Rupture Detection Standards Final Rule, published April 8, 2022—is applicable to newly constructed and entirely replaced onshore gas transmission and hazardous liquid pipelines with diameters of six inches or greater. While PHMSA is not allowed, by law, to impose retroactive design or

construction requirements on existing facilities, this new rulemaking would apply to all entirely replaced (two or more miles of pipe replaced within a stretch of five contiguous miles within any 24-month period) portions of the pipelines adjacent to the Indian Point site.

**Other pipeline incidents and safety lapses are cited in this letter. What has PHMSA done to make sure this isn't happening at the pipelines at Indian Point?**

PHMSA, NTSB, and our state partners carefully investigate to understand the circumstances leading to pipeline incidents. In some cases, we find that non-compliance contributed to the incident; in those cases, PHMSA and its state partners will take enforcement action and conduct inspections to verify the company has become, and remains, compliant. In other situations, PHMSA and NTSB may identify a new or emerging threat and PHMSA will alert companies to the issues, sometimes through industry-wide safety advisories; PHMSA and its state partners will adjust their inspection process to verify companies are aware of and appropriately addressing the issue. Regarding the Danville, KY incident, PHMSA has relayed the report to Enbridge for its review and appropriate action; PHMSA and its state partners review those actions during oversight processes.

PHMSA will often invest its limited research funds to understand new and emerging issues and translate those learnings into updated regulatory requirements. If PHMSA, NTSB, or state partners identify a need to modify a regulation, PHMSA will begin the rulemaking process, which can be time consuming to ensure diverse stakeholder input. Many stakeholders first observe this process when NTSB issues a recommendation to PHMSA. PHMSA works closely with NTSB, often partnering in joint investigations and almost always agrees with NTSB in its findings.

For example, in the case of NTSB's recommendation relating to PIR calculations, PHMSA has conducted research into PIR calculations, held a public meeting to gain stakeholder input, and will use the learnings to inform updated rulemaking on the topic.

**Do the new Integrity Management standards include the Hudson River rise during Hurricane Sandy?**

Yes. The Hudson River rise during Hurricane Sandy is an example of potential outside force damage. Enbridge is required to take measures to minimize the consequences to covered segments from outside force damage in accordance with Integrity Management regulations in Title 49 Code of Federal Regulations Part 192, Subpart O, §192.935(b)(2).

**What are the required reassessment intervals (especially of the older pipelines)? Really what are the dates and where are the reports in checking the older pipelines?**

Reassessment intervals are based on remaining anomalies in the line segment—with maximum intervals, for lowest risk pipe, every seven years. Reassessment intervals are discussed in §192.939 of the pipeline safety regulations. Enbridge is required to comply with all applicable pipeline safety laws and regulations. PHMSA and its interstate agent, NYSDPS, inspect Enbridge operations to determine compliance with this and other regulations.

**Per §192.939 what are the required reassessment intervals? Right now, it is indicated that the last inspection of the 26" pipeline was in 2005, the 30" pipeline inspected in 2004 and**

**2008 using different in-line inspection tools, and a “multi-purpose inline inspection” of the 42” was done in 2020. Is this correct information?**

As stated in the response above, reassessment intervals are based on remaining anomalies in the line segment. Additional internal inspections have occurred after the dates cited in the question, and PHMSA and NYSDPS have not identified a probable violation related to those inspections.

**What are the new tools used in the inspection of the old pipelines at Indian Point?**

Pipeline integrity can be evaluated using internal inspection technology. An inline inspection device, also known as a “smart pig,” is inserted into the line and flows down the pipeline, checking for deformities or anomalies in the pipe wall. These tools are sensitive enough to detect a scratch on the external wall of the pipe or a small dent. Some tools are designed to look for stress concentrators or movement of the pipe from its original position. Technologies powering inline inspection tools are constantly being updated. PHMSA establishes minimum standards to ensure risks are identified and mitigated using whatever the latest, most appropriate, technologies are that are available.

**Welds: What type of seam welds do the older pipelines under the nuclear plant have? Have these welds ever been reinforced? (San Bruno rupture happened after 54 years in the ground.)**

The three Algonquin pipelines that are in the vicinity (but not under) the nuclear plant, contain a variety of weld types to include, but not limited to, Double Submerged Arc Weld. Pipeline weld seams with defects may require replacement or remediation by installing a reinforcement sleeve.

**Assessment reads: “Defects that exceed acceptance criteria are usually repaired or replaced before the pipeline is placed in service.” Does this mean, like San Bruno, that there is never the opportunity to make better reinforcements on the welds on the pipeline?**

Threat assessments for in-service pipelines are normally conducted using internal inspection tools so that pipe can be replaced or remediated as needed. This allows the complete length of a long pipeline to be thoroughly evaluated. The strength of the weld seam can also be assessed by conducting a hydrostatic pressure test. Pipeline weld seams with defects can be repaired by installing a reinforcement sleeve or can be cut out and rewelded.

It is important to note the pipeline that failed in the San Bruno could not be internally inspected; Bends, valves, and variations in pipe diameter made in-line inspection impracticable. The failed segment in San Bruno was constructed of multiple very short sections of welded together.

<https://www.nts.gov/investigations/AccidentReports/Reports/PAR1101.pdf>

**What are PHMSA and Enbridge’s plans to ensure this sinkhole incident won’t happen in the pipelines next to Indian Point?**

PHMSA and the NYSPDS are monitoring the actions Enbridge is taking to investigate the sinkhole and to verify that the integrity of the pipelines has not been impacted. The information learned from the investigation will be applied to preventative and mitigative measures, as appropriate.

**Has PHMSA made Enbridge check the welds in the pipeline in Yorktown because of sinkhole stress on the pipe? If Enbridge is complying with 49 CFR §192.613 and §192.705, why did the sinkhole occur? (Good thing children’s sports weren’t scheduled at that time in Yorktown.)**

PHMSA and NYSDPS are aware of the referenced sinkhole and continue to monitor Enbridge’s geotechnical investigation activities to ensure compliance with applicable pipeline safety laws and regulations. Welds are designed to be stronger than the base material of the adjacent metal. While welds can fail due to extreme stress or strain, PHMSA and NYSDPS verified that Enbridge took action to verify that the sinkhole did not impact the integrity of the pipeline.

Sinkholes may occur due to a variety of environmental and soil conditions. While operators may not be able to prevent sinkholes in the vicinity of every segment of their pipelines, they must take prompt action to evaluate the condition and take appropriate mitigative action when sinkholes arise.

**Regarding emergency preparedness for pipeline incidents, do local fire departments conduct response drills? Are there specific things fire departments can do to prepare?**

The federal pipeline safety regulations—specifically §192.615 Emergency Plans, and §192.616 Public Awareness—require pipeline operators to provide information to emergency officials related to emergency preparedness; notify appropriate fire, police, and other public officials of gas pipeline emergencies; and coordinate both the planned responses and actual responses during an emergency with them. One way of providing such information may be through drills and exercises.

PHMSA does not have any regulatory authority over local emergency response agencies and encourages those agencies to actively engage with pipeline facilities operators to better understand each other’s emergency response capabilities and information needs.

**There are conflicting instructions for a pipeline/nuclear event—shelter in place/evacuate.**

In response to this comment, PHMSA references item 14 contained in the Public Comments and Questions from the September 22, 2022, Decommissioning Oversight Board (DOB) meeting. Information on the Indian Point DOB is available at [www.dps.ny.gov/indianpoint](http://www.dps.ny.gov/indianpoint).

**And come on, reverse 911 is not new. How has PHMSA never thought of that?**

In accordance with federal pipeline safety laws and regulations, pipeline operators are required to share information on their pipeline facilities with emergency response officials so that there is advanced knowledge of where pipelines are located in communities; what products are transported in them; and how to contact and work together with the pipeline operator in the event of an emergency. Emergency response officials’ responsibilities generally include assessing the emergency, rescuing and evacuating people, and removing and/or keeping ignition sources out of an area.

PHMSA has finalized a rulemaking requiring immediate notification of pipeline incidents, has proposed a rulemaking requiring more real-time emergency response notifications to first responders, and is considering a further rulemaking to enhance pipeline operator emergency response communications, which may include something like a reverse 911.

**A blast, of course, will blow out all telecommunications.**

PHMSA provides grant funding to local emergency planning organizations to prepare for hazardous materials incidents and responses.

**Heavy deconstruction, excavation operations with heavy equipment, vehicles, and vessels, which traverse the site each day. There are no markings of pipeline ROWs. “Operators must control construction on pipeline right of ways and ensure that they are carefully monitored to keep pipelines safe.” (PHMSA Operations and Maintenance Enforcement Guidance Part 192 Subparts L&M)**

NYSDPS has verified that the Algonquin pipeline facilities near Indian Point are marked in accordance with the federal pipeline safety regulations. It is the operator’s responsibility to maintain these safety markings, which PHMSA and NYSDPS will continue to monitor for compliance. In areas of on-going construction and excavation where it is extremely difficult to maintain signs or markers, the pipeline operator will also directly engage with those performing the activities to verify they are aware of the presence of the pipelines.

**Are there markers now on the pipelines that survey the property at Indian Point yet? (During a walk-through last year, some pipelines were exposed and some unmarked. Has this changed?)**

NYSDPS has verified that the Algonquin pipeline facilities near Indian Point are marked in accordance with the federal pipeline safety regulations and Enbridge’s procedures. It is the operator’s responsibility to maintain these safety markings, which PHMSA and NYSDPS will continue to monitor for compliance.

**Decommissioning operations and equipment could compromise the integrity of the three Algonquin pipelines at Indian Point...That’s pipeline safety oversight.**

PHMSA and its state partner (NYSDPS) provide safety oversight of the Algonquin pipelines and monitor Enbridge compliance with federal regulations. Enbridge performs real-time monitoring of the three interstate natural gas pipelines near Indian Point through Supervisory Control and Data Acquisition Systems (SCADA). These AGT pipelines undergo multiple layers of monitoring to confirm integrity and security of the pipelines. In addition to remotely monitoring pressures on its pipelines traversing the Indian Point site on a continuous basis, Enbridge is required to perform patrols of its pipelines per federal pipeline safety regulations and in accordance with its procedures. Federal pipeline safety regulations further require Enbridge to perform a gas leakage survey on its pipelines and maintain an integrity management program.

Per the Joint Proposal in Case 19-E-0730 between New York State, Holtec, and other parties, Holtec is required to notify NYSDPS and Enbridge at least five business days in advance of any excavation that could affect the pipelines.

Excavation activities must comply with 16 NYCRR Part 753 requirements, such as advanced notification to Dig Safety New York, wait for mark outs, hand expose the pipe location, limitation on power equipment usage within tolerance zone, and no usage of power equipment within four inches of the pipeline after identify location.

**An attendee indicated they toured Indian Point in 2020 and facility operator lacked knowledge on how to contact Enbridge.**

PHMSA is referencing NYSDPS's response to a similar comment in a previous public meeting:

Following the Department of Public Service's involvement in the pipeline risk assessment at Indian Point, which was completed in June 2018, DPS took a number of state actions that staff believes to be common-sense approaches to reduce the risk profile at the site. These actions included ensuring that strong communications channels existed between then-owner and operator Entergy and Enbridge. Following the sale to Holtec, DPS continued those efforts. Specifically:

- On August 9, 2018, DPS received written confirmation from Indian Point (Entergy) that they had Enbridge control room contact info in the Indian Point Control Room. Entergy included in their written confirmation to the DPS a copy of the Control Room Emergency Notification Binder demonstrating to the DPS that Enbridge's accurate contact information was included in their Control Room Emergency Notification Binder.
- In October 2018, DPS Staff performed a field audit of Enbridge control valves, during which time it confirmed that Enbridge's local field crews have the correct contact information for the IP control room.
- In May 2019, during an onsite visit to Indian Point, DPS Staff asked Entergy's Indian Point control room operators to show them the exact location of the Enbridge point of contact. Entergy operators demonstrated to the DPS Staff they knew where to find this number, located in the Emergency Notification Binder.
- Also in May 2019, as part of the DPS's audit of Enbridge's control room in Houston, Enbridge committed to adding Indian Point Control Room phone numbers to their list of "speed dial" numbers. DPS noted at the time that the Enbridge field crews already had this contact information, and the local field crews were the more likely entity to use it. DPS staff determined that for additional safety benefit it was important that the Enbridge control room also have the IP control room contact information, and Enbridge agreed to and enacted this recommendation.
- On August 1, 2021, during an onsite visit to Indian Point, DPS Staff asked Holtec's Indian Point control room operators to show them the exact location of the Enbridge point of contact. Holtec operators demonstrated to the DPS Staff they knew where to find this number, located in the Emergency Notification Binder.
- On an ongoing basis, the DPS facilitates quarterly meetings between Holtec and Enbridge where DPS continues to stress the importance of maintaining current contact information and coordinating any significant activities at or near the IP site.

**Dr. Robert Bea, disaster expert conceptual paper: What is Safe?**

**<https://medcraveonline.com/medcrave.org/index.php/MOJCE/article/view/14495/27388>**

Thank you for providing the conceptual paper by Dr. Robert Bea.