UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 6, 2015

Mr. Paul Blanch
135 Hyde Rd.
West Hartford, CT 06117

Dear Mr. Blanch:

I am responding to concerns you have raised concerning Spectra Energy's proposed 42-inch diameter natural gas pipeline that is planned to cross the owner-controlled property at the Indian Point Nuclear Generating Unit Nos. 2 and 3.

On October 15, 2014, you submitted a petition (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14294A751), pursuant to Title 10 *Code of Federal Regulations* (10 CFR) Section 2.206, requesting enforcement action against Entergy Nuclear Operations, Inc., the licensee for Indian Point Nuclear Generating Unit Nos. 2 and 3. You stated that the 10 CFR 50.59 site hazards analysis, prepared by the licensee to determine the safety impact on the Indian Point plant due to the proposed pipeline, is inadequate and incomplete. You requested that the Nuclear Regulatory Commission (NRC) issue violations of 10 CFR 50.9, "Completeness and accuracy of information," 10 CFR 50.59, "Changes, tests, and experiments," and 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." You also requested that the NRC issue a Demand for Information seeking, among other items, that Entergy provide the results of a new and realistic risk/hazard analysis.

In addition, by letter dated July 27, 2015, (ADAMS Accession No. ML15251A050), you provided 39 follow-up questions resulting from your presentation before the Petition Review Board (PRB) on July 15, 2015 (see transcript at ADAMS Accession No. ML15216A047). During that presentation, the PRB agreed to respond, in writing, to all of your follow-up questions.

Several of your submittals request NRC involvement that overreaches our regulatory authority. This includes NRC review and approval of the proposed pipeline along with the imposition of NRC requirements. Examples include requests to treat the pipeline, valves, control systems, and construction as safety-related and to require that they meet all NRC regulations including quality assurance, redundancy, environmental qualification, and inservice inspections. The NRC's role is limited to ensuring the safe operations of Indian Point Nuclear Generating Unit Nos. 2 and 3. Other Federal government agencies involved in the proposed Spectra Energy gas pipeline expansion include: (1) the Federal Energy Regulatory Commission (FERC), which is responsible for evaluating applications for authorization to construct and operate interstate natural gas pipeline facilities, (2) the Pipeline and Hazardous Materials Safety Administration of the Department of Transportation, which is responsible for administering the national regulatory program to ensure the safe transportation of natural gas, petroleum, and other hazardous materials by pipeline, (3) the Environmental Protection Agency, which is responsible for protecting human health and safeguarding the natural environment, (4) the U.S. Army Corps of Engineers which regulates any work or structures that potentially affect the navigable capacity of a waterbody, (5) the National Oceanic and Atmospheric Administration's National Marine

Fisheries Service, and (6) the U.S. Fish and Wildlife Service. In addition, there are multiple State and local government agencies that also have separate responsibilities. Therefore, many of your requests for NRC intervention cannot be granted by the NRC because they are outside of the regulatory authority of the NRC.

Throughout the PRB review of your petition, the supplemental letters, and your presentations before the PRB, you focused repeated attention on a number of issues. The PRB would like to summarize its findings on the following items:

Inaccurate and Incomplete 50.59 Site Hazards Analysis

The original petition of October 15, 2014, requested violations of 10 CFR 50.59, 50.9, and Appendix B to 10 CFR 50 for providing inaccurate and incomplete information in the 50.59 site hazards analysis. In addition, you requested a Demand for Information seeking an explanation as to why the previous violations do not also constitute a violation of 10 CFR 50.5, "Deliberate Misconduct."

The NRC staff thoroughly reviewed the licensee's 50.59 site hazards analysis and the results of that review were documented in the Region I inspection report dated November 7, 2014 (ADAMS Accession No. ML14314A052). As indicated in the inspection report, the staff determined that Entergy's conclusions involving the potential rupture of the proposed pipeline poses no threat to the safe operation of the plant or safe shutdown of the plant, are reasonable and acceptable, and are also comparable with the staff's independent confirmatory analysis. In addition, staff reviewed the qualifications and resume of Entergy's contractor who performed the licensee's analysis and determined that the individual possessed the requisite knowledge, experience, and abilities to conduct the pipeline hazards analysis and that the analysis had been conducted in accordance with approved procedures.

Therefore, the NRC staff does not agree with your assertions that the licensee's 50.59 site hazards analysis was inaccurate and incomplete and that the contractor performing their blast analysis was not qualified to Entergy's Appendix B Quality Assurance Program. As a result, no enforcement actions will be taken against Entergy.

Assumed 3 Minute Isolation Valve Closure Time for the Proposed Spectra Pipeline

Based on information included in Spectra Energy's application to FERC, Entergy's site hazards analysis assumed that remote plant operators located in Houston, TX, would be able to recognize a pipe rupture from pressure sensors located in the pipeline and take appropriate actions to close the pipeline isolation valves within 3 minutes of a major pipe rupture. You characterized this assumption as a material false statement.

Due to concerns regarding the significance of the assumed valve closure time, the NRC staff performed a bounding sensitivity analysis. The staff's sensitivity analysis consisted of two cases. First, the staff considered the case when the isolation valves are assumed to close within the time specified by Spectra Energy (3 minutes). Second, the staff assumed the release of gas for a full hour with the unbroken end of pipe connected to an infinite source. The resulting pressure pulse and heat flux values are only marginally different from one another and, in both cases, showed that equipment relied on to safely shut down the facility would remain available and operable. Therefore, the staff concluded that valve closure times do not have a

significant impact on the site hazard analysis, and the licensee's assumption of a 3 minute valve closure time does not have a material impact on that analysis.

Request for an Independent Risk Assessment Including a Transient Risk Analysis

The NRC, an independent regulatory agency, prepared its own independent confirmatory analysis of the effects on safety related equipment resulting from a postulated pipeline rupture and the results were comparable to those submitted by the licensee. For the evaluation of the explosion hazard, the NRC staff used the peak gas release rate resulting from a pipe rupture to estimate the mass of natural gas that would be available. This approach predicts more gas released than other approaches like a time dependent gas release or a release averaged over time.

The conservative, bounding analysis prepared by the NRC staff postulates more severe results than a transient analysis. A transient analysis averages the release of gas over time and the release rate would gradually decline. As described above, the NRC analysis assumed that the maximum release rate was sustained and did not decline in the manner that a transient analysis would predict. This conservative approach assumes more gas is available to explode than in a transient analysis, and produces results that bound more detailed analyses, such as a transient analysis.

Considering that the NRC's independent analysis is conservative and bounding, the NRC concludes there is no need for another NRC sponsored independent analysis.

The NRC Should Withdraw its Findings to the Federal Energy Regulatory Commission

You have requested that the NRC withdraw its findings to FERC that the proposed pipeline would not present an unacceptable risk to the Indian Point facility. The staff has performed a thorough review of Entergy's 50.59 site hazards analysis and has performed its own independent confirmatory analysis that is in agreement with the licensee's results. The NRC has no basis to withdraw its previous conclusions to FERC.

Follow-up Questions from the PRB Presentation of July 15, 2015

During your second presentation before the PRB on July 15, 2015, the PRB agreed to respond to your follow-up questions. Your letter of July 27, 2015, included a list of 39 questions. We have responded to your questions in the enclosure.

In summary, the NRC's role in the proposed natural gas pipeline is limited to its regulatory authority of ensuring the safe operation of the Indian Point operating facility. Based on the review of Entergy's 50.59 site hazards analysis and the NRC's independent calculation results using conservative assumptions and rationale, the staff has determined that Entergy has appropriately concluded that the proposed pipeline does not introduce more than minimal additional risk to the Indian Point facility and, therefore, the change in the external hazards analysis associated with the proposed pipeline does not require prior NRC review and approval.

The NRC appreciates your concerns and will continue to evaluate all new information regarding the existing and proposed natural gas pipelines through the Reactor Oversight Program.

Sincerely,

Christopher G. Miller, Director
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos.: 50-247 and 50-286

Enclosure
As stated

PETITIONER QUESTIONS RELATIVE TO

PETITION REVIEW BOARD MEETING OF JULY 15, 2015

INDIAN POINT PROPOSED NATURAL GAS PIPELINE

The petitioner's letter dated July 27, 2015, grouped questions together according to subject area. Each group of questions was preceded by a preamble. For the purpose of clarity, the preamble has been italicized followed by each question and the NRC staff's response.

Freedom of Information Act (FOIA) Requests

FOIA response #1 (ADAMS Accession No. ML15061A219 contains a summary and handwritten calculations that are not signed, dated, approved, reviewed, etc. Furthermore, an arbitrary and undefined term is added to the equation "Y" that results in a conclusion that grossly underestimates Potential Impact Radius (PIR), therefore the risk to the public.

FOIA response #2 (ADAMS Accession No. ML15247A108) contains an email from David Beaulieu dated April 27, 2015 (ADAMS Accession No. ML15274A108), which discusses gas pipeline dynamics. The information in this email directly contradicts the information provided to FERC by the NRC in its confirmatory analysis used in its approval of the Spectra Algonquin Incremental Market (AIM) project. This internal NRC email primarily addresses the operator response times and the amount of gas that will be released during a rupture. The gas release rate according to this email is close to one million pounds of gas per minute and likely to continue for hours. The result is that the NRC contradicts its own guidance (Regulatory Guide 1.91) for measuring (PIR) and clearly contradicts both the Entergy and the NRC analysis.

We now know from the NRC email of April 27, 2015 that the volume of gas and the amount of time it would take to terminate the gas flow totally undermine the public confidence that Entergy and the NRC are properly operating and regulating the plant. Moreover, because the blast radius, heat flux and vapor clouds effects are very likely underestimated. A long term Station Blackout (SBO) may result. Additionally we are now aware that the fuel oil tanks likely contain flammable material that has not been considered in any analysis.

The ramifications of these undocumented calculations and alleged material false statements are so grave that the NRC must rescind its approval of the pipeline because FERC based its approval of the Spectra AIM project on the alleged material false statements made to the NRC by Entergy in its analysis dated August 21, 2014 until a truly independent risk analysis is conducted.

The NRC provided its final analysis and approval to FERC in its inspection report dated November 7, 2007. The NRC personnel participating in this inspection have no documented experience in gas line accidents. In fact, the NRC's primary contributor, Mr. Tammara, has no documented experience in gas rupture dynamics or experience

with other events such as the San Bruno and other major gas line catastrophes and was not a member of the team conducting the inspection.

Mr. Richard Kuprewicz, a nationally recognized pipeline expert, and others have requested that the NRC endorse an independent, transparent, thorough risk assessment by recognized experts. The public and elected officials, including Senators Charles Schumer and Kirsten Gillibrand and Congresswoman Nita Lowey have also made this request, yet the NRC continues to stand by its confirmatory analysis of November 7, 2014 and refuses any consideration of any independent risk analysis by experts with documented credentials.

After the second presentation to the Petition Review Board, Mr. Richard Kuprewicz wrote to NY Assemblywoman Sandy Galef with a suggested plan for a transient risk analysis "that incorporates the true transient nature of a pipeline rupture capturing the extremely high change in gas rate release with time that reflects the tremendous extremes of a gas transmission pipeline rupture, especially on a 42-inch high pressure pipeline." Mr.Kuprewicz's plan could form the basis for the portion of the independent risk assessment.

Entergy, in its 10 CFR 50.59 analysis, stated that a rupture of the existing buried gas pipeline due to sabotage was not considered in the 2008 risk study conducted by Mr. David Allen that evaluated the potential terrorist threat to the exposed portions of the existing gas lines. Mr. Art Burritt of the NRC confirmed that failure of the existing gas pipeline may impact safety related Structures, Systems and Components (SSCs) at Indian Point located within 400 feet of these SSCs. This is an unanalyzed condition that requires immediate NRC attention. 10 CFR 50.72 requires reporting of this potential event within 8 hours, yet the NRC has not taken any visible actions to address this issue after more than four weeks while the plants continue to operate in an unanalyzed condition.

Questions

1. Please identify the missing information in FOIA document 1, including the date, author, approval chain, reviewers and the NRC's procedure for conducting safety related calculations.

Response

The NRC continues to withhold certain information in FOIA document 1 due to its security sensitive nature. The qualifications of the individual who performed the calculation are described in NRC Inspection Report 05000247/2014004 and 05000286/2014004 dated November 7, 2014 (ML14314A052). The calculation in FOIA document 1 was performed to support the above inspection and received an independent peer review within the NRC.

The NRC does not perform "safety-related calculations." Therefore, the NRC staff does not have specific procedures for performing calculations used to

support inspections or to perform confirmatory analysis. The term, "safety-related calculations" implies formal calculations performed by licensees for the design of NRC regulated facilities. Safety-related calculations by licensees must be performed in accordance with approved plant procedures and associated quality control. Calculations performed by the staff do not require the same level of documentation and are performed as needed to support independent confirmatory analysis.

2. In FOIA document 1, the NRC in its risk calculation modifies equation #1 of RG 1.91 by inserting an undefined term "Y". What is this undefined term and why was it used? Its impact may be significant.

Response

NRC Regulatory Guide (RG) 1.91, "Evaluations of Explosions Postulated to Occur at Nearby Facilities and on Transportation Routes Near Nuclear Power Plants," describes methods that the NRC staff finds acceptable for evaluating postulated explosions at nearby facilities and transportation routes. The NRC did not modify any of the equations in RG 1.91 as part of its confirmatory analysis.

Equations (3) and (4) of RG 1.91 explains how TNT equivalent, W_{TNT}, is determined and how equation (1) is used to determine the maximum distance from an explosion where an overpressure of 1.0 psi [pounds per square inch] is predicted to exist. Specifically:

$$E = \alpha \Delta H_c m_F \qquad \text{RG 1.91 Equation (3)}$$

where

E=blast wave energy
α=yield (i.e., the fraction of available combustion energy participating in blast wave generation)
ΔH_c=theoretical net heat of combustion
m_F=mass of flammable vapor released

$$W_{TNT}=E/4420 \text{ kj/kg} \qquad \text{RG 1.91 Equation (4)}$$

$$W_{TNT}= \alpha \Delta H_c m_F/4420 \qquad \text{Combining (3) and (4)}$$

The yield factor, α, included in Equation (3) is designated as "Y" in the NRC confirmatory calculation found in FOIA document 1 (ADAMS Accession No. ML15061A219). This is consistent with the methodology of RG 1.91 without any modifications to equation (3). Table 1 of RG 1.91 provides suggested yield factors and, for methane, 5% (0.05) is used.

3. Please provide the specific qualifications of the personnel conducting the inspection that provided the basis for the approval of the AIM project to FERC on November 7, 2014.

Response

NRC Inspection Report 05000247/2014004 and 05000286/2014004 dated November 7, 2014 (ADAMS Accession No. ML14314A052), identifies the inspectors who performed the inspection. All NRC inspectors must complete a rigorous qualification program that demonstrates that they possess the knowledge and skills necessary to effectively perform regulatory activities in their position. The knowledge and skills can be obtained through previous experience, formal training, study activities, and on-the-job training activities. Upon completion of the qualification program, the employee must pass an oral qualification board to confirm that the individual can integrate and apply agency, office, and position-specific competencies to actual situations. Inspector qualifications are continually maintained and enhanced through post-qualification and refresher training to ensure that the NRC has the skills needed to fulfill its mission.

4. In FOIA document 2 (ADAMS Accession No. ML15247A108), the NRC stated that the PIR [potential impact radius] would not be significantly impacted should the gas release continue for one hour instead of 3 minutes. Equation #1 of Regulatory Guide 1.91, that calculates the blast radius, directly contradicts this statement and predicts the PIR will be increased by a factor of 2.71 with a new PIR of about 3000 feet. How can the NRC ignore its own primary guidance?

Response

The NRC has not ignored its own primary guidance. Equation (1) of Regulatory Guide 1.91 states:

$$R_{min}=Z * W^{1/3}$$

Where R_{min} = distance from explosion where pressure equals 1 psi
Z = conversion factor (a constant)
W = equivalent tons of TNT

The NRC used the ALOHA code to determine the equivalent tons, W, to use in Equation (1) above. The ALOHA code recognizes that the bulk of the gas released would dissipate due to turbulence and buoyancy and would not be available for an explosion. Predicting an increase of the PIR by a factor of 2.71 is a misapplication of Equation (1) of RG 1.91. This misapplication increases W by a factor of 20 to account for a full hour release rather than 3 minutes. The factor of 2.71 is obtained by taking the cube root of 20. This approach is not realistic, ignores the buoyancy of natural gas and dissipation from turbulence, and assumes that natural gas will accumulate for a full hour and remain available for an explosion.

5. Will the NRC agree to an independent risk assessment prior to allowing any further construction on the project and any further disturbance to land? The composition of the team conducting the independent risk assessment must include nuclear and gas experts and there must be representation of stakeholders, including the public and impacted residents, as well as local, state and federal elected officials. The NRC may elect to be a part of this risk analysis team.

Response

The NRC does not have the authority to allow or reject the construction of this project. The NRC's role was, and is, to ensure that the licensee of the Indian Point facility adequately assessed the safety implications of the proposed pipeline at the nuclear site, as well as to determine if the licensee's analysis met the NRC's requirements regarding plant changes. The NRC found that the licensee adequately addressed the safety implications and that the proposed pipeline poses no threat to the safe shutdown of the facility. That having been said, the NRC, an independent government agency, performed its own independent confirmatory analysis of a potential rupture of the proposed natural gas pipeline and whether it would affect the safe operation of Indian Point. The analysis was conservative and bounding. The results of the NRC's analysis were similar to that obtained by Entergy's contractor, The Risk Research Group, Inc., and confirmed that a breach of the proposed natural gas pipeline will not prevent an orderly safe shutdown of the Indian Point facility. The staff does not believe that additional analyses of the proposed pipeline are necessary.

6. When will the NRC conduct a thorough safety analysis of the existing 63-year old buried pipeline, which by Mr. Burritt's own admission, this failure is likely to impact vital structures without any documented analysis?

Response

The NRC and its predecessor, the Atomic Energy Commission (AEC), have conducted a thorough safety analysis of the existing natural gas pipelines multiple times. Each time, the NRC or AEC staff concluded that the failure of the existing gas pipelines will not impair the safe operation or shutdown of the Indian Point facility.

Among the many analyses documented are the AEC's Safety Evaluation Report, issued on September 21, 1973 (ADAMS Accession No. ML072260465), which stated on p. 2-4 that: "Two natural gas lines cross the Hudson River and pass about 620 feet from the Indian Point 3 containment structure. Based on previous staff reviews, failures of these gas lines will not impair the safe operation of Indian Point 3." The previous staff reviews were the NRC's review of the Preliminary Safety Analysis Report, submitted by Consolidated Edison on August 30, 1968 (ML093480204).

On December 6, 1995 (ADAMS Accession No. ML11227A100), the licensee submitted the Individual Plant Examination of External Events (IPEEE) report for Indian Point. In this report, the licensee first evaluated any susceptibility to damage from seismic events. Based on a hazard analysis, the licensee concluded that the probability of occurrence was low enough that the pipelines could be screened out as a seismic vulnerability. The licensee next considered pipeline failures from other causes, such as an inadvertent overpressure condition. Although the licensee concluded there is a small probability that conditions could exist that would cause damage to Indian Point Unit 3, it screened this scenario out from further consideration based on the low probability of the scenario. The NRC's staff evaluation report of the Indian Point Unit 3 IPEEE did not identify any deficiencies with this approach.

In April 2003, NRC staff undertook a review of the possible consequences of a rupture of a pipeline, independent of the probability of a pipeline failure. The staff concluded that for a large rupture and resulting fire, safety-related structures would not be significantly affected. With respect to potential fires, the effects are limited to possible ignition of flammable materials such as wood, as well as injury of exposed on-site personnel (principally skin burns). For the one scenario that might damage safety-related structures (the explosion of a large unconfined vapor cloud), the staff concluded that the factors needed to achieve an explosion creating sizeable overpressures make the probability for occurrence very low.

In 2008, the licensee contracted another evaluation of the pipelines. In an evaluation dated August 14, 2008, the contractor evaluated three scenarios based on a simultaneous rupture of both pipelines; a jet fire, a vapor cloud flash fire, and a large vapor cloud explosion. The NRC reviewed this analysis and concluded that failures of these gas pipelines will not impair the safe shutdown of Indian Point.

Pipeline Integrity

The NRC Petition Review Board stated in a letter dated April 28, 2015 to me: (ADAMS Accession No. ML15124A027)." The pipeline isolation valves are constructed under criteria developed by the U.S. Department of Transportation (DOT). Therefore, the petitioner's concerns regarding the safety class of the isolation valves should be directed to DOT." The NRC has no authority to delegate nuclear safety to the DOT. The operations, integrity, and inspections of these valves are partially designed "to prevent or mitigate the consequences of accidents which could result in potential offsite exposures" to the environment and are therefore safety related. See 10 CFR 50.2 below.

10 CFR 50.2 Definitions

Safety-related structures, systems and components means those structures, systems and components that are relied upon to remain functional during and following design basis events to assure:

(1) The integrity of the reactor coolant pressure boundary

(2) The capability to shut down the reactor and maintain it in a safe shutdown condition; or

(3) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the applicable guideline exposures set forth in § 50.34(a)(1) or § 100.11 of this chapter, as applicable.

Questions:

7. How will the NRC assure nuclear safety and impose NRC Regulations on the design and construction of the proposed AIM project?

8. How will the NRC assure that the valves, piping, control systems and leak detection systems and other vital components meet the following NRC Regulations:

- Quality Assurance
- Redundancy
- Environmental Qualification
- In-Service-Inspections
- ASME codes
- Technical Specifications
- Emergency response
- Operator training
- Other NRC Regulations for safety related components

Response to Questions 7 and 8

The NRC does not have the regulatory authority to impose its requirements on natural gas pipelines. A complex interstate natural gas pipeline expansion such as this requires the involvement of a number of Federal and State government agencies all having their distinct responsibilities. Other Federal government agencies involved in the proposed Spectra Energy gas pipeline expansion include: (1) the Federal Energy Regulatory Commission, which is responsible for evaluating applications for authorization to construct and operate interstate natural gas pipeline facilities, (2) the Pipeline and Hazardous Materials Safety Administration of the Department of Transportation, which is responsible for administering the national regulatory program to ensure the safe transportation of natural gas, petroleum, and other hazardous materials by pipeline, (3) the Environmental Protection Agency, which is responsible for protecting human health and safeguarding the natural environment, (4) the U.S. Army Corps of Engineers, which regulates any work or structures that potentially affect the navigable capacity of a waterbody, (5) the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, and (6) the U.S. Fish and Wildlife Service. The design and construction of the proposed pipeline will be performed in accordance with the applicable regulations found in Title 49 of the *Code of Federal Regulations* administered by the Pipeline and Hazardous Materials Safety Administration within the Department of Transportation. Therefore, the NRC will not perform a review of the proposed pipeline, and there will be no attempt to impose NRC regulations on the design and construction of the pipeline.

The NRC's role with respect to the proposed pipeline is limited to ensuring the safe operation of the Indian Point facility. In this regard, NRC regulations required the licensee to perform a site hazards analysis to determine the safety impact of the proposed pipeline. Entergy performed this analysis and submitted it for public inspection on August 21, 2014 (ADAMS Accession No. ML14253A339). The Entergy analysis concluded, and the NRC independently confirmed, that the proposed pipeline will not impair the safe operation or shutdown of the Indian Point facility.

Valve closure time

Entergy, in its analysis, stated the gas flow would be terminated within 3 minutes, should a rupture occur. I believe this to be a material false statement.

The Entergy 10 CFR 50.59 safety evaluation confirmatory analysis (EN-LI-101 ATT 9.1, Rev.11) states:

> *The existing pipeline automation and control system, which would be used for the proposed new 42-inch pipeline near IPEC [Indian Point Energy Center], does not provide for an automatic isolation of the closest upstream and downstream mainline valves upon the detection of a pipeline rupture.*
>
> *The two closest actuated valves are located at milepost 2.61 on the west side of the Hudson River and at milepost 5.47 just east of IPEC. They would require an operator to take action to close these valves. The system, however, is monitored 24 hours a day and an alarm would immediately alert the control point operator, located in Houston, Texas, of an event and isolation would be initiated. This would result in all of the gas between these valves at the time of closure being able to vent or burn. The estimated time to respond to the alarm (less than one minute) and the closure time of the valves (about one minute) was used as the basis for an assumed closure time of three minutes for the analysis performed in the attached report."*

In the email of April 27, 2015 (FOIA document 2) from David Beaulieu to NRC staff, including Mr. Douglas Pickett, the premise for the 3-minute timeframe for remote valve closure was re-evaluated. It concurs with Mr. Kuprewicz's statement during the first petition review call on January 28, 2015, that a pressure drop may not be identified right away. The Beaulieu email cites a report from the Oak Ridge National Laboratory, "The time between a pipeline break and RCV closure can vary from about 3 minutes for immediate leak or rupture detection to hours if field confirmation of the break is necessary to validate the closure decision."

The NRC based its recommendation to FERC on the 3-minute remote closure time. This NRC internal document is more than sufficient to grant my petition as it substantiates the submission of information contrary to the requirements of 10 CFR 50.9.

Mr. Kuprewicz reviewed the FOIA documents in preparation for the PRB call and wrote an email to me on July 14, 2015 in which he stated:

> *Rupture will always be a full bore rupture, releasing at both ends of the open pipes as the fracture mechanics forces throw tons of buried pipe steel out of the ground yielding very large craters (the location of the rupture at these pressures should be performed at a site nearest the plant).*
>
> *The location of the rupture so close to an upstream compressor station will mask pressure loss indications for quite some time, as mass release*

significantly exceeds the flow rate in the pipeline before rupture. Pressure loss indication will not be the primary indicator of a pipeline rupture for quite some time.

Right now I believe, very high heat fluxes will be the most likely scenario that may impact equipment to safely shutdown the plant, though blast forces cannot at this time be evaluated on these various structures, my experience would suggest blast is not controlling on the facility though you have a better understand of specific plant safety equipment location needed to cool down the facility.

The repeated attempts to convey that an analysis of a rupture at this site near the plant on the 42-inch actually reflects the actual rupture case reflects a serious lack, even negligent (a term I don't use lightly in public) attempt, to properly analyze a 42-inch pipeline rupture scenario, on this line at this site, on this system.

Any critical independent analysis should clearly define the base case scenario and pipeline operating conditions (flow, pressure) before trying to defend any resulting conclusions.

Questions:

9. How many valves are required to be closed should a rupture occur in either the proposed or the existing gas lines?

10. Are all of these valves remotely operated?

11. Is a single failure[1] considered?

Response to Questions 9, 10, and 11

The design and construction of the proposed pipeline, which includes requirements for the pipeline isolation valves, will be performed in accordance with the applicable regulations found in Title 49 of the *Code of Federal Regulations* administered by the Pipeline and Hazardous Materials Safety Administration within the Department of Transportation.

As explained in the response to questions 7 and 8, the NRC does not have the regulatory authority to impose its requirements on natural gas pipelines. Therefore, the NRC will not perform a detailed design review of the proposed pipeline and there will be no attempt to impose NRC regulations on the design and construction of the pipeline.

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[1] *Single failure*. A single failure means an occurrence which results in the loss of capability of a component to perform its intended safety functions. Multiple failures resulting from a single occurrence are considered to be a single failure. Fluid and electric systems are considered to be designed against an assumed single failure if neither (1) a single failure of any active component (assuming passive components function properly) nor (2) a single failure of a passive component (assuming active components function properly), results in a loss of the capability of the system to perform its safety functions. (10 CFR Part 50, Appendix A)

12. Why has the NRC not informed FERC that the fundamental assumptions and calculations were inaccurate?

Response

The NRC staff concludes that the fundamental assumptions and calculations relied upon for its confirmatory analysis remain accurate.

Independent analyses performed by both Entergy and the NRC staff concluded that a rupture of the proposed pipeline will not adversely impact the safe shutdown of the Indian Point facility. The staff's confirmatory analysis was conservative and bounds expected conditions that would result from a pipeline rupture.

13. Has the NRC staff reviewed the piping and instrumentation (P&IDs) diagrams for the new gas line showing valves, pressure, flow and leak detection instruments? If so, please describe. Does the design meet all NRC requirements to assure all regulations, codes and standards are being properly applied and met?

14. Has the NRC evaluated Spectra's procedures and operator response times and ability to detect a significant loss of integrity of a major gas line?

Response to questions 13 and 14

No. The staff does not plan to perform a detailed review of piping and instrumentation diagrams for the pipeline. As explained in the response to questions 7 and 8, the NRC does not have the regulatory authority to impose requirements on natural gas pipelines. The NRC will not perform a review of the proposed pipeline procedures or Spectra operator training.

15. Has the NRC evaluated Spectra's safety record with regard to pipeline leaks and incidents? A Spectra pipeline ruptured in the Arkansas River on May 31, 2015 and the company did not know about it for over 24 hours.

16. Why, as stated by the NRC in the Petition Review Board call on July 15, 2015, did the NRC not look at the 30" San Bruno pipeline rupture incident in 2010, or other major gas line ruptures documented by the NTSB [National Transporation Safety Board], when doing the confirmatory analysis of the 42" diameter AIM pipeline?

17. What historical data did the NRC use in its confirmatory analysis to evaluate the risk of rupture of the 42-inch diameter high-pressure pipeline?

Response to questions 15, 16, and 17

As previously discussed, the NRC's regulatory authority regarding the proposed pipeline is limited to ensuring the safe operation of the Indian Point facility. In that regard, the NRC reviewed the analysis conducted by the Indian Point licensee, which concluded that operation of the new pipeline would have minimal impact on plant safety and would not

require a license amendment. In addition, the NRC staff performed an independent confirmatory analysis which was conservative and bounding. The staff's analysis was deterministic and did not rely on quantitative risk or probabilities of failure. Therefore, historical information regarding previous natural gas pipeline ruptures and Spectra Energy's safety record was not material and not considered as part of the NRC staff's review and confirmatory analysis.

Blast radius

Regulatory Guide 1.91 contains an equation #1 for determining the blast radius or Potential Impact Radius. According to Entergy's and the NRC's analyses, both Entergy and the NRC calculate the blast radius from a rupture of a 42 inch diameter pipeline operating at 850 psi in the range of approximately 1100 feet.

If the amount of gas released continues for one hour instead of 3 minutes about 20 times more gas will be released. According to the NRC's own equation #1, this alone will increase the blast radius from about 1100 feet to about 3000 feet without any consideration of vapor clouds or heat flux.

Furthermore, the June 29, 2015 letter from the NRC to me addresses reference #6 "Risk Analysis of Natural Gas Pipeline: Case Study of a Generic Pipeline," Chiara Vianello", Giuseppe Maschio Università di Padova, DIPIC – Dip. di Principi e Impianti Chimici di Ingneria Chimica Via Marzolo 9 – 35131 Padova, Italy" that projects a PIR approaching 8000 feet.

According to the Entergy report of August 21, 2014, the two SSCs Important to Safety (ITS) structures closest to the new AIM pipeline are the switchyard (115 ft.) and the GT2/3 fuel tank (105 ft.). The report states, "a loss of the SSCs important to safety would not result in a significant decrease in the margin of safety provided for public health and safety except for the assumed loss of the switchyard and GT 2/3 FOST, which are more significant SSCs ITS." However, the evaluation then continues, "a postulated gas pipeline rupture near the switchyard could cause total loss of the switchyard of the type that could occur with low probability events such as extreme natural phenomena (e.g. earthquake, tornado winds/missiles, hurricanes, etc.) that the switchyard is not protected against. The potential loss of the switchyard can result in loss of offsite power to the plant and result in a generator or turbine trip with or without fast bus transfer to the turbine generator bus. This is considered a relatively high probability event..." The report goes on to analyze the loss of back-up power and Entergy concludes that design enhancements reduce risk, however this risk reduction is not analytically supported.

The conclusion in the report is not supported by the NRC regulations and is refuted in its internal documents, references and citations. There most certainly is a risk of complete loss of power, failure of back-up generation, loss of the access road and the city water tank and the risk of a full system failure must be evaluated in a thorough, transparent, independent risk assessment. Entergy may have analyzed the loss of the switchyard and the FOST independently, but not due to a single initiating event.

Questions

18. Why would the NRC revert to such an obscure reference #6 that is not even cited in RG 1.91?

19. Why does PIR radius range from 800 to 8000 feet depending on reference used? Why did the NRC use the smaller radius when assessing risk?

Response to questions 18 and 19

The NRC's letter dated June 29, 2015 (ADAMS Accession No. ML15097A190), states that the acceptance criteria for evaluating potential hazards are found in Standard Review Plan 2.2.3, "Evaluation of Potential Accidents." The acceptance criteria requires licensees to either: (1) use a deterministic approach to evaluate the impacts of a hazard, or (2) demonstrate that that the quantitative risk is acceptably low on the basis of low probability of explosions. A demonstration that the rate of exposure to a peak positive incident overpressure in excess of 1.0 psi (6.9 kPa) is less than $1x10^{-}6$ per year when based on conservative assumptions, or $1x10^{-7}$ per year when based on realistic assumptions, is acceptable.

The NRC staff performed an independent confirmatory analysis using a conservative deterministic analysis that assumed a double-ended rupture of the proposed gas pipeline. The staff's analysis did not consider probabilities. Therefore, a probabilistic analysis was not required and any technical argument regarding the use of probabilities is moot for this approach. The staff's discussion of probabilities included in the letter of June 29, 2015, along with the inclusion of Reference 6, demonstrated the rationale and conservatisms of NRC's assumptions in addressing the event frequencies for the consequences of a catastrophic pipeline rupture. The cited Reference 6 discussed vapor cloud explosion and heat flux scenarios pertaining to generic pipelines and, therefore, there is no direct relevance between the reference and the methodology of RG 1.91. Consequently, a comparison of PIR radii range is neither applicable nor appropriate.

Finally, the NRC staff disagrees with the above extrapolation of the blast radius from 1100 to 3000 feet. As discussed in the response to question 4, it is a misapplication of Equation (1) of RG 1.91 to extrapolate a 3 minute gas pipeline release to a 1 hour gas pipeline release by multiplying the available mass by a factor of 20 and taking the cube root. Multiplying the calculated safe distances by a factor of 2.71 (i.e., the cube root of 20), ignores buoyancy of natural gas and artificially assumes that the entire amount of gas released over an hour will remain confined and available for an explosion. Thus, the above argument extending the calculated safe distance of 1100 feet to 3000 feet is flawed.

Questions

20. Why do the NRC and Entergy use very different formulas to calculate blast radius, both claiming compliance with RG 1.91?

21. Why did the NRC modify the equation for calculating the blast radius in RG 1.91?

22. RG 1.91 specifically states "Methods and solutions that differ from those set forth in regulatory guides will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission." These calculations and methods differ from the Regulatory Guide. Did the NRC use RG 1.91, as the sole reference for evaluating explosions postulated to occur at nearby facilities and on transportation routes near nuclear power plants?

23. Why did Entergy and the NRC fail to provide a basis for deviation from the Regulatory Guide?

Response to Questions 20, 21, 22, and 23

RG 1.91 is the staff's guidance document for evaluating the impact of explosions from nearby facilities and transportation routes. Entergy and the NRC used the methodology and equations of RG 1.91, without deviation, to determine the blast radius of 1.0 psi. No other methodology was used. As discussed in the response to question 2, neither Entergy nor the NRC modified the equations of RG 1.91.

24. Why would the NRC use the EPA computer program (ALOHA), which is prohibited for use for a gas pipeline rupture, not referenced in RG 1.91, to calculate the blast radius of a rupture that could have a devastating impact to the more than 20 million persons residing in the vicinity of Indian Point?

Response

The NRC staff used the Areal Locations of Hazardous Atmospheres (ALOHA) computer code to determine the mass of natural gas resulting from a double-ended pipeline rupture that would be available for an explosion. The ALOHA computer program does not prohibit its use for modeling gas pipeline ruptures. It is important to understand what is meant by the ALOHA User's Manual statement: "*ALOHA cannot model gas release from a pipe that has broken in the middle and is leaking from both broken ends,*" and how the staff modeled its confirmatory analysis to address this limitation.

In order to determine the minimum safe distance to 1 psi overpressure using the methodology of RG 1.91, it is necessary to determine: (1) the initial gas release rate from the pipeline break and (2) the total amount of gas available for an explosion at the source of the release. The calculated release may be determined by equations available in standard literature reference material or by using appropriate computer models. In this case, the NRC staff used the ALOHA computer code as a tool to calculate the maximum release rate, which is converted by hand calculation to TNT equivalent. The TNT equivalent value is then used to calculate the minimum safe distance to 1 psi overpressure using the methodology of RG 1.91. The ALOHA code was not directly used to calculate the minimum safe distance.

The ALOHA User's Manual includes conditions and limitations for its use. Specifically, when modeling a pipe rupture, ALOHA assumes unidirectional flow from only one end of the broken pipe. Thus, when modeling a guillotine pipe rupture, all flow is assumed to be

released from one end of the broken pipe without any backflow from the opposite, or downstream end of the pipe. Clearly, some amount of backflow would be expected from the downstream end of the broken pipe and some type of correction is necessary to use ALOHA to model this scenario.

When evaluating a break in the middle of a pipeline, the NRC staff doubled the predicted gas release from the upstream side of a pipe break to account for flow escaping from both sides of the break. This approach is conservative because in the event of an actual break, the downstream side of the pipe would release much less gas than the estimated release from the upstream side.

The staff also compared release rates calculated by ALOHA with average release rates calculated manually, based on equations available in reference literature and reports. The ALOHA model calculated maximum and average release rates that are higher than the release rates calculated by hand and, therefore, are considered conservative for this application. Accordingly, the staff is confident that its use of the ALOHA code is appropriate for this application and results in conservative gas release rates.

25. Has the NRC performed a validation and verification of the ALOHA program to ascertain its accuracy?

Response

There is no need for the NRC staff to perform a validation and verification of the ALOHA computer program. ALOHA has been measured against similar computer models and the results are considered comparable.

ALOHA is part of the CAMEO® software suite, which is developed jointly by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (EPA). Versions of ALOHA have existed since the early 1980s. ALOHA is a computer program designed to model chemical releases for emergency responders and planners. It can estimate how a toxic cloud might disperse after a chemical release and it includes several fire and explosion scenarios. ALOHA can model how a hazardous gas cloud will travel downwind—including both neutrally buoyant and heavy gas dispersion. Additionally, if the chemical is flammable, ALOHA also models pool fires, vapor cloud explosions, jet fires, and flammable gas clouds (where flash fires might occur).

Blast Impact

The NRC's email from April 27, 2015 states the quantity of gas released in a pipeline rupture is calculated by the same prohibited ALOHA program as 376,000 kg in the first minute and a release of 200,000 kg in the next two minutes (accounting for the pressure drop) and 100,000 kg after the valve closure. In the first four minutes, the amount of energy released is equal to that from the atomic bombs dropped on Japan in 1945. Once more the use and results of ALOHA for this calculation is questionable however assuming these numbers are correct:

Questions

26. Why would the NRC allow tons of TNT equivalent to be transported per minute through a nuclear site putting the entire Hudson Valley, and its residents and infrastructure at stake without a detailed analysis?

27. Why does the NRC continue to ignore potential major amounts of flammable material in the fuel oil storage tanks? Why has the NRC refused to respond directly to questions about the contents of these tanks?

Response to questions 26 and 27

The NRC reviewed the licensee's 50.59 site hazards analysis and performed an independent confirmatory analysis that substantiate Entergy's conclusions that the proposed pipeline poses no increased risks to the Indian Point facility. The NRC staff shared its findings with FERC, which subsequently approved the proposal. Multiple Federal and state agencies had a role in the review and approval of the Spectra pipeline. As previously discussed, the NRC does not have regulatory authority to approve the proposed natural gas pipeline. The role of the NRC is limited to ensuring that the Indian Point licensee performed a site hazards analysis in order to determine whether the proposed pipeline presented an unacceptable risk to the safe operations of the facility.

The fuel oil tanks of concern were formerly used to generate super heat for the Indian Point Unit 1 steam generators. Indian Point Unit 1 was permanently shut down in 1974. Since that time, the fuel oil tanks have been drained, decommissioned, and abandoned onsite. Supply piping to the fuel oil tanks has been disconnected. If any residual oil remains in these tanks, it would not represent any concerns. Any remaining residual oil would not be explosive and at worst, would only present a minor fire hazard.

Vapor Clouds

RG 1.91 cites "International Atomic Energy Agency [IAEA], Safety Standards Series, Safety Guide No. NS-G-3.1, "External Human Induced Events in Site Evaluation for Nuclear Power Plants, 2002, Vienna Austria" as a reference. This International Standard addresses vapor cloud explosions and states: "In some States (Countries) an SDV [screening distance value] in the range of 8–10 km is used for the sources of hazardous clouds."

Apparently the IAEA considers the danger from vapor clouds to range out to beyond 8 Km, yet the NRC has no problem locating major gas transmission lines within 400 feet of vital structures of two operating 1000 Mwe nuclear plants located in one of the most densely populated areas in the world.

Questions

28. Fully recognizing this is not a regulation but only a statement and that most of the world avoids gas lines within 8 to 10 Km from nuclear plants, how can the NRC

justify locating gas lines within 400 feet of vital structures without any justification or explanation?

29. Why wasn't an explanation from an IAEA document included in the analysis? How did the NRC evaluate the potential for vapor cloud explosions while totally ignoring its own guidance provided in RG 1.91 and its references?

Response to Questions 28 and 29

IAEA Safety Standards Series, Safety Guide No. NS-G-3.1, "External Human Induced Events in Site Evaluation for Nuclear Power Plants," provides recommendations and guidance for evaluating potential site locations for nuclear power plants in order to identify hazardous phenomena associated with human induced events initiated by sources external to the plant. The IAEA document does not provide guidance on analyzing potential gas pipeline ruptures and, therefore, there was no need to reference it in either the Entergy site hazards analysis or NRC's confirmatory analysis.

The statement quoted from the IAEA document, "In some States [countries] an SDV [screening distance value] in the range of 8–10 km is used for the sources of hazardous clouds," was a footnote intended as a tool to initially screen out those facilities and activities to which no further consideration to external hazards should be given. The IAEA document does not recommend that gas pipelines be separated from nuclear power plants by 8-10 km.

Similar to the 50.59 site hazards analysis performed by the licensee for the proposed pipeline, Entergy used the same contractor using the same methodology to perform a similar site hazards analysis for the existing gas pipelines in 2008. As discussed in the responses to questions 6 and 31, this analysis assumed the simultaneous rupture of both gas pipelines at their above ground locations. The licensee's analysis concluded that a rupture of both gas pipelines at their above ground location will not result in damage to safety related structures. The NRC staff reviewed this analysis and concluded that failures of these gas pipelines will not impair the safe shutdown of Indian Point.

The NRC staff did not ignore the guidance of RG 1.91. As previously discussed, the staff's confirmatory analysis to evaluate vapor cloud explosions did not modify the equations of RG 1.91 and implemented the methodology without exception.

General Concerns

30. I have reviewed both the Entergy and NRC calculations and did not see any calculations discussing heat flux. How did the NRC calculate the impact of heat flux, vapor cloud explosions and possible secondary fires such as from the "abandoned" fuel oil storage tanks?

Response

The ALOHA code was used by both Entergy and the NRC staff to calculate heat flux resulting from a postulated rupture of the proposed gas pipeline. The NRC staff performed a bounding analysis that assumed a double-ended rupture of the proposed pipeline with an

infinite upstream source of natural gas for a full hour. The threshold value of heat flux, i.e., 12.6 kw/m^2, where plastic melts, was not exceeded within the security owner controlled area (SOCA) fence and, therefore, safety-related structures, systems, and components would not be exposed to the threshold value of heat flux.

The NRC staff did not consider secondary fires or other secondary impacts such as fuel oil storage tanks. The GT2/3 fuel oil storage tank near the switchyard is located 105 feet from the proposed pipeline's location. If this tank ruptured, local topography would result in its contents flowing away from the site and, therefore, it would not represent a threat to the Indian Point facility. The abandoned fuel oil storage tanks that supported operation of Indian Point Unit No. 1 were drained and decommissioned following the permanent shutdown of Unit No. 1 in 1974. These tanks are located several hundred feet outside of the SOCA fence. Any residual oil that might remain in these tanks would not explode and at most, would only burn. A small fire at this location would not represent a threat to the Indian Point facility.

31. Please explain why the probability of failure and risk for the existing gas line is less than that of the new gas line. Indian Point's Final Safety Analysis (FSAR), approved by the NRC states that a failure of the existing buried gas transmission lines is "not feasible" which, to me means it is significantly less than 10^{-7} failures per year. How can the proposed AIM pipeline realistically have a higher failure probability than the existing 63-year old line that has no documented inspection history?

Response

There has been no assertion by either the licensee or the NRC that the probability of failure and risk for the existing gas pipelines is less than that of the proposed new gas pipeline.

Section 2.2.2, "Site Ownership and Control," of the Indian Point 3 UFSAR is being misinterpreted. Section 2.2.2 of the UFSAR was updated in Revision 3 to reference a 2008 study of the existing natural gas pipelines. Up until that time, only a single gas pipeline was assumed to rupture. However, since acts of intentional and malicious activity could no longer be excluded, the licensee contracted a study that assumed the simultaneous rupture and ignition of both gas pipelines at the above ground location inside the owner controlled property. This would clearly represent worst case conditions and would provide the most conservative analysis for explosions and fires.

The licensee assumed that the most likely cause for both exposed pipelines to rupture would be the result of a terrorist action. The licensee's statement that "*An attempt to uncover, breach and ignite a buried portion of the pipeline was not considered feasible*," represents the conclusion that a terrorist would target the exposed pipelines as opposed to bringing in heavy equipment to uncover buried piping. The licensee's statement makes no reference to probability. Thus, any attempt to link the licensee's statement of "not feasible" to a determination that the probability of a pipe rupture is less than 10^{-7} failures per year, is out of context and a misinterpretation of the UFSAR.

Finally, with regard to the statement that the existing gas pipeline "has no documented inspection history," see the response to question 33 below.

32. Entergy, in its analysis, considers the potential for AIM gas line ruptures to be a Design Basis Event (DBE). The existing old gas lines are much closer to vital SSC's and the failure of these lines is intuitively much higher. Why does Entergy and the NRC not consider these lines to be a potential DBE and associated requirements imposed?

Response

The existing gas pipelines were not required to be analyzed as a potential design basis accident (DBA) in the Final Safety Analysis Report as part of the original licensing of Indian Point. Notwithstanding this, the potential rupture and ignition of the existing gas pipelines is considered part of the plant's licensing basis, and has been reviewed. Similarly, the proposed AIM gas pipeline was not required to be analyzed as a potential DBA, and was instead analyzed and evaluated through the 10 CFR 50.59 process.

33. Has the NRC reviewed Spectra's operating and inspection procedures to assure the integrity of the existing Algonquin gas transmission system?

Response

No. The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) enforces regulations for the nation's gas pipeline transportation system.

Spectra Energy implements standard operating procedures requiring: (a) periodic inspection of its pipelines using in-line inspection tools able to identify potential corrosion and damage defects, (b) monitoring of corrosion protection systems, and (c) frequent aerial patrols to identify unauthorized activities on the right-of-way. Since the Algonquin Indian Point right-of-way containing the 26-inch and 30-inch natural gas pipelines is located in a defined high consequence area (HCA) as interpreted and classified by Spectra, PHMSA regulations require inspections of pipelines located in HCAs on a more frequent basis, with a maximum interval of seven years for the internal inspections.

Algonquin has advised Entergy that, consistent with those regulations, Algonquin most recently conducted in-line tool inspections of the existing 26-inch and 30-inch lines in 2011 and 2014, respectively. Algonquin further advised Entergy that all inspections and follow-up actions were completed in accordance with applicable regulations and its own engineering standards. Pursuant to regulations in 49 CFR Part 192, Spectra Energy is required to maintain pipeline records for the useful life of the pipeline.

34. Are Entergy operators at Indian Point trained in how to address an explosion/fire/gas release from existing the lines or even aware of the location of the lines at Indian Point or knowledgeable about the risks associated with these 63-year-old lines?

Response

As a condition of their license, Indian Point is required to have a Fire Protection Program where plant operators are trained as a fire brigade to respond to and fight a comprehensive variety of plant fires.

The NRC regularly inspects the ability of the fire brigade to respond to fires through its Reactor Oversight Process baseline inspection program. We verify through inspections that the site fire brigade maintains the ability to properly respond to, and extinguish, plant fires.

35. Do Entergy and Spectra coordinate safety and emergency response training? How often is training conducted? Does the NRC review these training procedures?

Response

There are no NRC requirements for Entergy and Spectra Energy to coordinate safety and emergency response training. However, as part of the Reactor Oversight Process, the NRC reviews Entergy's emergency planning procedures and training.

These reviews include regular drills and exercises that assist licensees in identifying areas for improvement, such as in the interface of security operations and emergency preparedness. Entergy is required to exercise its emergency plan with offsite authorities, including the local Buchanan fire department, at least once every two years to ensure state and local officials remain proficient in implementing their emergency plans. Those biennial exercises are inspected by the NRC and evaluated by FEMA. Licensees also self-test their emergency plans regularly by conducting drills. Each plant's performance in exercises can be accessed through the NRC website at the Reactor Oversight Process page.

36. What actions will the NRC take to respond to the existing pipelines' unanalyzed condition?

Response

Both the licensee and the AEC/NRC have analyzed the existing gas pipelines and concluded that they do not present an unacceptable risk to the Indian Point site. See the response to question 6.

37. Has the NRC reviewed Entergy's existing and proposed emergency procedures for the local Buchanan volunteer fire brigade to deal with a major rupture and resulting fires at the Indian Point facility? Has the NRC discussed the ability and/or inability to provide adequate fire services with the local Buchanan volunteer fire brigade? If not, why? If so, how adequate does the NRC deem the Buchanan volunteer fire brigade is in addressing a pipeline rupture at Indian Point?

Response

Plant procedures are in place which require a call for offsite fire department assistance for numerous situations, including the case if the onsite fire brigade is unable to effectively control or extinguish the fire. In the case of a natural gas pipeline failure near Indian Point, it is expected that a call for offsite support would be made. Plant operators or fire brigade members would not be responsible to isolate the source of the natural gas, or rely on automatic isolation valves. Rather, the gas pipeline transmission operator would isolate the source from a remote control station. Damage to plant structures would not impair the safe operation of the facility or its ability to safely shutdown.

As discussed in the response to question 35, the local Buchanan fire department participates in biennial exercises of the Entergy emergency plan. Those exercises, which are inspected by the NRC and evaluated by FEMA, demonstrate the continued proficiency of the Buchanan fire department to provide their necessary support.

38. Did the NRC receive and review the Piping, Instrumentation and Flow Diagrams of the proposed and the existing gas transmission lines?

Response

No. The design and construction of the existing and proposed gas pipelines are outside the authority of the NRC. Therefore, there is no regulatory basis for the NRC to review detailed design information of either the existing or proposed gas pipelines. Design requirements of the nation's natural gas pipelines are included in Title 49 of the *Code of Federal Regulations* that are administered by the Pipeline and Hazardous Materials Safety Administration of the Department of Transportation.

39. Does the NRC have any Quality Assurance requirements/procedures for conducting safety related calculations? If so, what are they?

Response

No. As discussed in the response to question 1, the NRC staff does not perform "safety-related" calculations. Calculations may be performed by the staff as needed to support independent confirmatory analysis. In this case, the staff performed an independent analysis that received a peer review by a qualified NRC engineer.

The NRC appreciates your concerns and will continue to evaluate all new information regarding the existing and proposed natural gas pipelines through the Reactor Oversight Program.

Sincerely,

/RA/

Christopher G. Miller, Director
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos.: 50-247 and 50-286

Enclosure
As stated

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