

*Lawrence S. Criscione, PE*

*Paul M. Blanch, PE*

December 18, 2012

Senator Joseph Lieberman, Chairman  
U.S. Senate Committee on Homeland Security & Governmental Affairs  
706 Hart Office Building  
Washington, DC 20510

Subject: Specific Security Vulnerabilities at the Oconee and Indian Point Nuclear Stations and the Generic Implications for Components of Critical Infrastructure Regulated by Multiple Federal Agencies

Dear Senator Lieberman:

We are writing to you and your committee about our grave concern regarding the failure of the Nuclear Regulatory Commission and Homeland Security to protect the United States against potential terrorist attacks and random dam or gas transmission pipeline failures.

The potential energy released in a gas line rupture at Indian Point is equivalent to that from a massive conventional bomb; the 2010 explosion and fire in San Bruno, CA is an example of the destructive force, which a pipeline rupture can unleash. The flooding resulting from a failure of Jocassee Dam at Oconee would be similar to that experienced at Fukushima following the tsunami. Although the reactors at Oconee and Indian Point are in well-guarded, hardened facilities, the support systems required to keep those reactors from melting down are not nearly as well hardened and are susceptible to extensive damage from either flooding or a natural gas cloud explosion. Also, although the guard forces assigned to these reactor plants are capable of denying unauthorized access to their vital support systems, these guard forces are neither capable of denying access to critical infrastructure

external to the plant (e.g. the natural gas transmission pipeline at Indian Point or the Lake Jocassee Dam at Oconee) nor capable of defending the plant against the energy released by the destruction of this external critical infrastructure.

Although a terrorist attack upon or the random failure of a dam or natural gas pipeline is extremely unlikely, the potential impact of one of these events is the meltdown of multiple reactors, at either Indian Point or Oconee, resulting in severe radiological and economic consequences to areas surrounding these plants. For the natural gas pipeline explosion at Indian Point, New York City and areas extending beyond 50 miles, along with the infrastructures could be rendered uninhabitable for generations.

Both the NRC and Homeland Security have been aware of these potential threats for years and have as yet failed to determine whether any action is needed to prevent or deter these events.

We are two professional engineers who have served in the US Navy for a combined total of more than 35 years protecting our country from foreign and domestic threats and are concerned that the NRC and Homeland Security seem to be ignoring events that may have similar and possibly greater consequences to military threats.

Paul Blanch has more than 45 years of nuclear engineering, design and operational experience including consulting for the State of New York related to the relicensing of Indian Point. In 1993, Mr. Blanch testified before your Committee on retaliation against individuals raising safety issues in the commercial nuclear industry. Mr. Blanch has also been employed at Indian Point reporting to the Chief Nuclear Officer and has a detailed knowledge of the Indian Point site.

Lawrence Criscione has more than 19 years of nuclear engineering and operational experience and has worked for the past three years as a Reliability & Risk Analyst for the US Nuclear Regulatory Commission.

All of the information contained within this letter is publically available, most of it available through the NRC's ADAMS information system.

Enclosed with this letter are two similar but separate issues regarding security concerns to commercial nuclear reactor plants.

The first enclosure<sup>1</sup> details the vulnerability at the Indian Point Nuclear Power Station due to natural gas lines that pass through the station. It is noteworthy that there was a 20-inch gas line rupture on December 11, 2012 in Sissonville, West Virginia. It was reported this explosion sent flames more than a quarter mile (1300 feet). There are vital structures at Indian Point within 400 feet of much larger and higher-pressure gas lines. (See photos in Enclosure 1). It is a well-known fact that there is little or no protection from either a waterborne or airborne attack.

The second enclosure details a vulnerability at the Oconee Nuclear Station due to a pump storage dam located upstream of the plant.

In addition to potential malevolent acts, our concern is also the failure of the gas pipeline or dam due to natural phenomena (e.g. seismic activity) or latent engineering/construction flaws. The mislabeling by the NRC of these concerns as “Security-Related Information” has impeded their resolution in that, in our opinion, our democratic and republican processes can only function properly when the public is adequately informed of vulnerabilities threatening their safety. Withholding information “from the terrorists” has absolutely no impact on seismic occurrence or engineering failures.

Due to the chronic labeling of our safety concerns as “Security-Related Information”, we must concede that experts at the applicable agencies (e.g. the Nuclear Regulatory Commission, the Federal Energy Regulatory Commission, the Department of Homeland Security) have deemed the gas pipeline and pump storage dam as pieces of critical infrastructure vulnerable to terrorist action and therefore requiring protection. This concession brings an entirely new aspect to our concerns: is the federal government currently capable of coordinating between disparate federal agencies in order to guard the security of the affected nuclear reactor plants?

When it comes to security, there are two aspects that must be considered:

- The minimum threat required to damage the piece of critical infrastructure (e.g. can a given dam be destroyed merely by some drunk teenage vandals with some stolen dynamite and a canoe, or does it require the action of highly trained underwater demolition experts from a technologically advanced nation-state’s intelligence services?)

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<sup>1</sup> 2.206 Petition for Enforcement action from Paul m. Blanch dated October 25, 2010

- The maximum credible threat which can reasonably be expected

If the maximum credible threat is below the minimum threat required, then the piece of infrastructure need not be protected. That is, if the dam can only be destroyed by operatives from the CIA, KGB, MI6 or Mossad, then it need not be guarded since it is not likely that these organizations would be deployed against the dam.

If the maximum credible threat is greater than the minimum threat required, then the piece of infrastructure needs to be guarded.

The maximum credible threat assumed for commercial nuclear reactor plants is classified as “Safeguards” information and cannot be released to the public. We do not know what the exact design basis threat used by the NRC is, but it is no secret that it is roughly a squad of well-armed terrorists.

Regardless of what the NRC uses for its design threat, it stands to reason that this same design threat should be applied to pieces of critical infrastructure whose destruction could result in a nuclear accident – assuming that these same pieces of critical infrastructure can be destroyed by the design threat.

So, the question becomes whether or not the natural gas pipeline mentioned in Enclosure 1 or the dam mentioned in Enclosure 2 are capable of being destroyed by the design basis credible threat which the NRC assumes could be assembled to attack a commercial reactor plant. If the answer is “no”, then there should be absolutely no reason to withhold the safety concerns associated with these vulnerabilities from the public. The fact that the NRC has consistently withheld these concerns from the public leads us to assume that the answer is “yes”.

Since the natural gas pipeline mentioned in Enclosure 1 and the dam mentioned in Enclosure 2 are capable of being destroyed by the design basis threat assumed by the NRC, then these pieces of critical infrastructure need to be guarded to the same level of protection applied to commercial reactor plants. However, the NRC does not have the authority to apply its security requirements on natural gas pipelines regulated by the Department of Transportation (DOT) or on dams regulated by the Federal Energy Regulatory Commission (FERC).

We respectfully request that the staff of the Senate Committee on Homeland Security and Governmental Affairs review the two enclosures, and, if appropriate, request a review by the Government Accountability Office. The NRC has

reviewed both of these enclosures and apparently saw no problems. We would like to know whether or not the natural gas pipeline mentioned in Enclosure 1 or the dam mentioned in Enclosure 2 are guarded to the same design threat as the commercial nuclear reactors which these structures threaten. Of particular concern:

1. At these pieces of critical infrastructure (e.g. Jocassee Dam) is there an adequate security force present, trained and regularly inspected to repel the design credible threat, which the NRC uses for the nuclear reactors it regulates?
2. Are the critical infrastructures guarded against insider threats? Particularly, do the security, operations and maintenance personnel who have access to these pieces of critical infrastructure receive the same level of background verification and follow-on screening as required by the NRC for security, operations and maintenance personnel at the nuclear reactors it regulates?

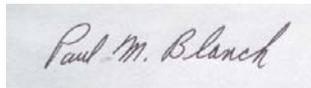
Please recognize that this is not an issue that can be delegated to the Nuclear Regulatory Commission, the Department of Transportation, or the Federal Energy Regulatory Commission. The NRC does not –and should not – dictate the security requirements for natural gas pipelines and dams. FERC and DOT should not necessarily require the same security measures as the NRC requires. However, for those rare instances when the destruction of a FERC or DOT regulated piece of critical infrastructure can lead to an accident at an NRC regulated facility, then there must be a federal executive level coordination that ensures that adequate protection is in place. Although providing this coordination is not the domain of your committee, ensuring it occurs is.

We respectfully request that your staff review the enclosures and determine if the nuclear reactor plants involved are adequately secure from attack. If these plants are adequately secure, then we request that you inform the Nuclear Regulatory Commission that it is inappropriate to continue to withhold the safety implications of these concerns from the public under the guise of protecting security. If these plants are not adequately protected, then we request that the Nuclear Regulatory Commission shut down these plants until adequate protection is established.

Regarding the “Generic Implications” of our concerns with the external threats to the reactors at Oconee and Indian Point, we respectfully request that your staff review the policies of the Department of Homeland Security (DHS) to verify that DHS is able to ensure the security of components of critical infrastructure regulated by one federal agency (such as the DOT regulated natural gas pipeline at

Indian Point), which can potentially affect components of critical infrastructure regulated by a separate nuclear utility (such as the NRC regulated reactors at Indian Point), is being adequately assessed and coordinated by the appropriate federal agencies.

Very respectfully,



Paul M. Blanch  
135 Hyde Road  
West Hartford CT 06117  
860-236-0326

[pdblanch@comcast.net](mailto:pdblanch@comcast.net)

[LSCriscione@hotmail.com](mailto:LSCriscione@hotmail.com)



Lawrence S. Criscione,  
1412 Dial Court  
Springfield, IL 62704  
573-230-3959

Cc: Senator Susan Collins, Ranking Member, Homeland Security &  
Governmental Affairs

Congressman Pete King, Chairman, Homeland Security  
Congressman Bennie Thompson, Ranking Member, Homeland Security  
Senator Richard Durbin, Illinois  
Chairman Allison Macfarlane, US Nuclear Regulatory Commission  
Special Counsel Carolyn Lerner, US Office of Special Counsel  
Michael Corradini, American Nuclear Society  
Leslie Barbour, Nuclear Energy Institute  
David Lochbaum, Union of Concerned Scientists  
Scott Amey, Project on Government Oversight  
Louis Clark, Government Accountability Project  
Ken Bunting, National Freedom of Information Coalition  
Tyson Slocum, Public Citizen Energy Program  
Jim Riccio, Greenpeace

# ***Paul M. Blanch*** ***Energy Consultant***

October 25, 2010

**Mr. William Borchardt**  
**Executive Director for Operations**  
**U.S. Nuclear Regulatory Commission**  
**Washington, DC 20555-0001**

**Dear Mr. Borchardt:**

**SUBJECT:** 10 CFR 2.206 Petition regarding Inadequacy of Entergy's Management of Spectra/Algonquin Energy Natural Gas Transmission Lines within the site boundary at Indian Point Nuclear Plants

## **INTRODUCTION**

I am submitting this 10 CFR 2.206 petition solely on behalf of myself due to my grave concern about the undue risk presented by the natural gas transmission lines traversing the entire Indian Point site.

In early 2009 I first became aware of the presence of the natural gas lines<sup>1</sup> from an Indian Point Condition Report (CR) dated December 2008. This CR identified the existence of gas line or lines and its potential to cause buried pipe corrosion of other lines important to nuclear safety.

After many months of research I determined that the proximity of these gas transmission lines to Indian Point nuclear plants may not have been properly analyzed, may not be in compliance with NRC regulations, and likely present an undue risk to the general public.

My concern increased to alarm at news of the San Bruno, California gas line explosion on September 10 of this year, and the realization that the gas lines passing through the Indian Point facility are the same vintage, however are much larger in capacity.

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<sup>1</sup> Figure 6 provides an overview of the routing of the gas lines through the Indian Point site

Specifically, my concerns are:

- Indian Point is not in compliance with existing regulations or the regulations in effect at the time of the initial issuance of the license.
- Sections of the gas lines<sup>2</sup> are unprotected from those wishing harm to the United States.
- The potential consequences to the general public and the New York, New Jersey and Connecticut infrastructure are incalculable and could be devastating to the US economy.
- The potential energy released in one hour<sup>3</sup>, should a gas line rupture occur, is about the same as that released over Hiroshima in 1945 (about 15,000 tons of TNT).
- It is possible that a rupture of the lines would result in a significant release of radioactive materials from both operating plants along with possible severe damage to the fuel in the spent fuel pools and subsequent releases.
- The original license was predicated on the fact that there were automatic shutoff valves in the gas lines; but these were subsequently removed without any apparent analysis as required by NRC regulations<sup>4</sup>.
- There has been no specific training by the onsite or offsite fire departments to deal with this type of fire/explosion.
- There is no means to extinguish a major gas line fire until the flow of gas is terminated (upstream and downstream) from multiple gas transmission lines.
- Operators may be impaired (dead) due to the heat generated or due to lack of oxygen.
- It is not know if specific procedures are in place to coordinate with the gas company in the event of a rupture or an explosion.

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<sup>2</sup> Figure 5 clearly shows the gas lines exiting the Hudson River have little or no physical protection.

<sup>3</sup> <http://convert-to.com/energy-units.html>

<sup>4</sup>10 CFR 50.59

- Even if these procedures are in place it is likely communication channels would be disrupted in the event of an explosion/fire.
- A gas line explosion would likely disable all sources of electrical power due to the proximity to the offsite power and potential lack of oxygen to the emergency power sources.
- There are no references to the gas lines ability to withstand a seismic event.
- Testing of the integrity of the gas pipes is unknown.

I have attempted to resolve my concerns with the NRC Regional Administrator and the Chairman's Office, but have been told by the NRC that.<sup>5</sup>

*"[T]he licensee concluded that the pipelines do not pose a safety or security hazard to the Indian Point facility. This evaluation is not available to the public, as it contains security-related information. The NRC staff reviewed the licensee's evaluation, and concluded that the presence of the gas pipelines at the Indian Point site does not endanger the safe or secure operation of the facility."*

In the past (2009), I had a similar concerns related to security and safety of Indian Point. As a result of my concerns the NRC Regional Administrator authorized a private meeting with me and NRC technical personnel and shared non-public information, thereby alleviating my concerns. I requested a similar meeting related to the gas lines and my request was rejected.

While some of the information related to the dangers of the gas lines may be security related, this does not justify inaccurate and misleading information contained within official NRC/Entergy documentation and analysis.

Other recent evaluations of natural gas transmission pipeline hazards to nearby nuclear facilities are readily available in the NRC's online electronic library, ADAMS. For example, the 2004 hazard evaluation for the National Enrichment Facility (NEF) can be viewed and downloaded using Accession No. ML042460718. Public access to this evaluation, which concludes that a 16 inch 50 psi natural gas pipeline poses undue risk at NEF, strongly suggests the Indian Point evaluation is being withheld from public disclosure to cover-up a known hazard.

Pursuant to §2.206 of Title 10 in the Code of Federal Regulations, I request that the Nuclear Regulatory Commission (NRC) initiate a proceeding pursuant to §2.202 of Title 10 in the Code of Federal Regulations. I request the NRC to issue a Demand for Information (DFI)

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<sup>5</sup> April 12, 2010 letter to Paul Blanch from David C. Lew, Director Division of Reactor Projects Region I

Order that Entergy Indian Point demonstrate its capability to protect the public in the event of a natural gas line rupture/explosion/fire in the proximity of and passing directly through the Indian Point site.

I further request that the NRC review all information in its possession and the information provided by Entergy and Indian Point's previous owners/operators to determine if the nuclear plant is in compliance with all applicable regulations potentially impacted by a breach and subsequent fire/explosion of the natural gas line(s) traversing the Indian Point site.

It is further requested that the NRC issue a Demand for Information to Entergy seeking the bases for compliance with all regulatory requirements/guidance including but not limited to:

- Subpart A of 10 CFR 100.10<sup>6</sup> (Evaluation Factors for Stationary Power Reactor Site Applications Before January 10, 1997 and for Testing Reactors)
- Appendix A to Part 100—"Seismic And Geologic Siting Criteria For Nuclear Power Plants"
- 10 CFR 50.48 "Fire protection"
- Appendix R to Part 50—"Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979"
- 10 CFR 50.55a Codes and standards applicable to piping and systems
- 49 CFR 192 "Transportation Of Natural And Other Gas By Pipeline: Minimum Federal Safety Standards"
- Appendix A to Part 50<sup>7</sup>--"General Design Criteria for Nuclear Power Plants"

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<sup>6</sup> Subpart A of 10 CFR 100.10

"In addition, the site location and the engineered features included as safeguards against the hazardous consequences of an accident, should one occur, should insure a low **risk** of public exposure."

Note there is a significant difference between risk and probability of an event. Risk has not been considered in the Indian Point 2 Individual Plant Examination of External Events (IPEEE) evaluation.

<sup>7</sup> Criterion 3--Fire protection. Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of **fires and explosions**.

Criterion 4, "Environmental and Missile Design Basis," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Licensing of Production and Utilization Facilities," requires that nuclear power plant structures, systems, and components important to safety be appropriately protected against dynamic effects resulting from equipment failures that may occur within the nuclear power plant as well as events and conditions **that may occur outside the nuclear power plant.**

- 10 CFR 54.3(a) that defines the Current Licensing Basis that includes Safety Analysis Reports, as well as licensee commitments documented in NRC safety evaluations (SERs).
- NRC Information Notice 91-63: Natural Gas Hazards At Fort St. Vrain Nuclear Generating Station
- 10 CFR §50.59 Changes, tests and experiments.

## Background

1. The first supplement to the Safety Analysis Report (SAR) to Indian Point Unit 3 in 1968 states the following with the clear statement that there are ***automatic shut-off valves*** capable of terminating gas flow in the event of a gas line rupture and/or explosion. The SAR states:

*"In the field of maintenance, Algonquin has employed a more comprehensive program than the average industry wide practice. To check for leaks, "Algonquin conducts a monthly foot patrol and a bi-weekly airplane patrol of the mains."*

*Under this-surveillance, any leak that might develop would be detected before a hazardous condition could arise. In addition to the patrols, Algonquin performs monthly tests on all of the relief valves and ***automatic shut-off valves*** in the system to make certain that the valves function properly. A monthly check is also made of the cathodic protection system.*

*Under the heading of maintenance, it should be mentioned that measures have been taken to avoid the most common cause of pipeline failure which is an accidental puncturing of a main by construction or farm equipment. Although the mains are over 300 feet from the closest point of Unit #3 construction site, as an additional safety measure, Consolidated Edison has staked out the exact location of the mains and signs have been installed warning heavy equipment to stay clear.*

*However, once Unit #3 is in operation, construction at the site will be completed and the possibility of construction damage to the mains will no longer exist. In the light of the foregoing discussion, it can be concluded that conditions which might lead to a pipeline failure have either been provided for in the design of the pipes, or do not exist at the Indian Point site.*

*However: postulating a pipeline failure at Indian Point, two possibilities must be considered. The first possibility would be a rupture or explosion of the main, but with no fire occurring. This has been the most common situation according*

to the Federal Power Commission's Safety Report. "In the event of an explosion, protection must be provided against concussion damage and missile damage in the form of flying pipe fragments. The distance of the plant from the mains will provide adequate protection for both cases."

The primary fire would be of short duration since **automatic shut off valves** would **isolate the ruptured section of the main within 4 minutes**. Those valves are located at both banks of the Hudson River and at Gomer Street in Yorktown, 10.4 miles from the plant. The secondary fire would be set in the trees surrounding the gas mains. It should be noted that even if the rupture occurred at the closest point to the plant and the wind blew the flames toward the plant, it is extremely unlikely that the flames would reach the plant 400 feet away.

2. The 1973 NRC Safety Evaluation Report for Indian Point Unit #3 states the following:

*Nearby Industrial, Transportation and Military Facilities New York State Route 9, which passes through Peekskill and Buchanan, is located on the east bank of the Hudson River and Route 9W and the Palisades Interstate Parkway on the west bank of the Hudson River. A Penn Central railroad line passes within 0.85 mile of the Indian Point 3 containment structure on the east bank of the Hudson River; on the west bank, a line of the Penn Central Railroad passes approximately one mile from the Indian Point site. Two natural gas lines cross the Hudson River and pass about 620 feet from the Indian Point 3 containment<sup>8</sup> structure. **Based on previous staff reviews, failures of these gas lines will not impair the safe operation of Indian Point 3.***

3. The 1995 Individual Plant Examination of External Events for Indian Point Unit No. 2 states the following:

#### *6.4.3 Gas Pipeline Accidents*

*There are **two** underground natural gas transmission lines (26<sup>9</sup>-inch and 30-inch diameter) passing through the Indian Point site about 1,000 feet from the closest Unit 2 plant structures. Using actual industry data and information specific to these pipelines, the IPPSS conservatively calculated the frequency of*

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<sup>8</sup> There are other structures located closer to the gas lines, such as the control room, emergency power sources and emergency cooling components.

<sup>9</sup> Other documents indicate the presence of one 30" line and two 26" lines operating at a pressure of about 700 psi. The 2007 Indian Point Energy Center Applicant's Environmental Report Operating License Renewal Stage states there are "three natural gas pipelines (one 30-inch main and two 24-inch mains) that traverse the Indian Point site."

*a failure of these pipelines which could pose a hazard to the plant as about  $5 \times 10^{-7}$  per year. This value, if it remains valid for this examination is less than  **$1 \times 10^{-6}$**  and would allow this event to be screened out.*

*The Algonquin Gas Transmission Company which operates these pipelines was contacted as part of the IPEEE to obtain an update on the performance and service history of the pipelines. The response is provided in Reference 6-9 and is summarized below:*

*The 26 inch pipeline that passes through the IP2 site was also retested after installation. IPPSS stated that only similar sections of 26 inch line were retested.*

*Pressure relief valves are no longer used at valve sites and have been replaced with line pressure monitors at various locations. **Automatic shutoff controls have recently been removed from all valve sites due to their history of false closures.** With an effective **emergency response plan in place** and the use of a Supervisory Control and Data Acquisition (SCADA) system, quick response to line breaks is expected, which is considered more reliable than the automatic shutoff controls previously in place.*

*For the section of pipeline in the vicinity of IP2, vehicle patrol inspections of the pipeline near vehicle access points are now performed on a weekly basis. (At the time of IPPSS, the inspection frequency was once a month.)*

*Based on the updated information obtained during this examination, the analysis provided in the IPPSS was considered to remain applicable, and allows this postulated event to be screened out (Screening Level 4 of Figure 6.0-1).*

4. In 2004, Framatome ANP conducted an analysis as required by 10 CFR 70 and NUREG 1520 of a 16-inch natural gas line operating at low pressure of <50 psi. The conclusion of this analysis was that the probability of a pipeline explosion is significantly higher than  $10^{-6}$  explosions per mile-year. The Indian point gas lines are a much larger diameter, two or three lines vs. one line and operating at 700 psi therefore the probability of an explosion is significantly higher, and much greater than  $10^{-6}$ . The final conclusion of this study is:

*A postulated rupture of the gas pipeline near the NEF could pose the following the hazards:*

- *Overpressure on plant structures due to shock waves generated by detonation or explosion of the gas cloud from mixing of the released gas and the atmosphere.*

- *Impact by missiles propelled by air bursts from detonation or explosion of the gas cloud.*
- *Radiant heat flux on plant structures due to combustion of the gas/air mixture in the gas cloud.*

*A hazard model estimated the likelihood of a gas line rupture and the subsequent hazards that could impact NEF plant operations. The yearly probability of these hazards is  $9.44 \times 10^{-6}$  /year. Therefore, the event is considered credible in accordance with NUREG-1520.*

The NEF risk was from a single natural gas pipe, 16 inches in diameter and pressurized to less than 50 psi whereas Indian Point has two or three pipes ranging in size from 24 to 30 inches and pressurized to 700 psi. This “pipeline is about 1800 feet (ft) from the Technical Services Building (TSB), the nearest critical NEF structure.”

The risk of a 16 inch, 50 psi gas line located in Eunice, New Mexico is unacceptable yet two or three unprotected gas lines at Indian Point, containing more than 100 times the amount of energy, with more than 20 million residents residing within 50 miles is acceptable according to the NRC.

5. Spectra Energy on its web site<sup>10</sup> states:

*“The Algonquin Gas Transmission pipelines transport 2.44 billion cubic feet of gas per day through 1,100 miles of pipeline.”*

The gas flow rate passing through the Indian Point site is not known precisely however it can be assumed that a significant portion of this amount does transit the site and would be released due to a line rupture. If it is assumed that 50% or 1.2 billion cubic feet of gas passes per day then about 50 million cubic feet would be released in one hour. This does not assume any back flow in the event of a double ended rupture. The energy contained in these 50 million cubic feet is about 50 billion BTUs. This is about the same amount of energy (12,000 tons of TNT) released by the nuclear bomb dropped on Hiroshima in 1945.

6. The most recent FSARs available for Indian Point Units 2 and 3 are completely silent with respect to the risk due to potential gas line ruptures. These FSARs only

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<sup>10</sup> [http://www.spectraenergy.com/what\\_we\\_do/businesses/us/assets/algonquin/](http://www.spectraenergy.com/what_we_do/businesses/us/assets/algonquin/)

mention the presence of one 26 inch line and ignores the existence of the other unknown lines.

NUREG 0800 requires the FSAR to contain analysis for each of the mentioned types of accidents. The review covers the following specific areas:

- Hazards associated with nearby industrial activities, such as manufacturing, processing, or storage facilities.
- Hazards associated with nearby transportation routes (aircraft routes, highways, railways, navigable waters, **and pipelines**).
- The following principal types of hazards will be considered with respect to each of the above areas of review.
- Toxic vapors or gases and their potential for incapacitating nuclear plant control room operators.
- Overpressure resulting from explosions or detonations involving materials such as munitions, industrial explosives, or explosive vapor clouds resulting from the atmospheric release of gases **(such as propane and natural gas or any other gas) with a potential for ignition and explosion.**

7. REGULATORY GUIDE 1.91 “Evaluations Of Explosions Postulated To Occur On Transportation Routes Near Nuclear Power Plants” states:

*If transportation routes are closer to structures and systems important to safety than the distances computed using Figure 1, the applicant may show that the 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 psi (7 kPa) is less than **10<sup>-6</sup>** per year, when based on conservative assumptions, or **10<sup>-7</sup>** per year, when based on realistic assumptions, is acceptable. Due consideration should be given to the comparability of conditions on the route to those of the accident data base.*

The gas line traversing is not technically a “transportation route” but the impact is the similar. Figure 1 of this Regulatory Guide clearly shows that if it is assumed that 10% of the natural gas explodes, (1,200 Tons TNT equivalent) the peak overpressure will be exceeded, even if the explosion is more than 1000 feet from vital structures however the closest vital structures are within 500 feet of the gas lines.

8. NRC Information Notice 91-63: Natural Gas Hazards at Fort St. Vrain (Colorado) Nuclear Generating Station. This notice was issued more than 15 years after the occurrence and a full two years after the plant was permanently shutdown. This Information Notice clearly conveys the NRC’s expectation that a 10 CFR 50.59

analysis is required for changes that may impact external events such as gas line explosion in the proximity of the nuclear plant. IN 91-63 states:

*The natural gas pipelines and wells completed between 1973 and 1983 introduced additional unanalyzed external hazards that could have affected the safe operation of the Fort St. Vrain facility. These additional hazards were not evaluated by the licensee prior to their introduction to the site to determine the impacts on the safe operation of the plant and whether these hazards exceeded those evaluated during the initial licensing of the facility. For the gas well drilled in 1987, the licensee's 10 CFR 50.59 evaluation was too narrowly focused and did not consider additional possible malfunctions before concluding that an unreviewed safety question was not involved.*

### **Information Requested**

1. The 1968 SAR for Indian Point clearly states

*"The primary fire would be of short duration since **automatic shut off valves** would **isolate the ruptured section of the main within 4 minutes**. Those valves are located at both banks of the Hudson River and at Gomer Street in Yorktown, 10.4 miles from the plant."*

The SAR is part of the Current licensing Basis (CLB) as defined in 10 CFR 54.3 unless it has been formally changed.

At the time of the SAR, were these valves actually present and did they exist in all gas lines crossing the Indian Point site?

Is monthly testing of relief valves and shutoff valves still conducted and are these results reviewed by Entergy?

Does Entergy have a procedure for reviewing these test results?

Has a single failure as defined by 10 CFR 50 Appendix A been analyzed as it applies to these valves?

2. The 1973 NRC Safety Evaluation Report for Indian Point Unit #3 reports *"Based on previous staff reviews, failures of these gas lines will not impair the safe operation of Indian Point 3."*

Please provide a copy of the "staff reviews" and the bases for its determination that these gas lines will not impair the safe operation of the plants.

3. The most recent Unit 2 UFSAR states:

*“ENIP2 owns Units 1 and 2 while Entergy Nuclear Indian Point 3, LLC (ENIP3) owns Unit 3. The Algonquin Gas Transmission Company has a right-of-way running east to west through the property, 2840-ft long and 65-ft wide. Unit 2 is 1450-ft north of the 26-in. Algonquin gas main.”*

The most recent Unit 3 UFSAR states:

*“[T]he Algonquin Gas Transmission Company has a 26 inch gas main on a right-of-way (approximately 1350 feet long and 65 feet wide) running east to west through Entergy’s property.”*

Both of these FSARs appear to provide contradictory, inaccurate, and incomplete information (10 CFR 50.9) and infer that there is only one 26” natural gas line. The UFSAR must be accurate and updated per the requirements of 10 CFR 50.71(e).

4. The 1995 Individual Plant Examination of External Events (IPEEE) for Indian Point Unit No. 2 states the following:

#### *6.4.3 Gas Pipeline Accidents*

*There are two underground natural gas transmission lines (26-inch and 30-inch diameter) passing through the Indian Point site about 1,000 feet from the closest Unit 2 plant structures. Using actual industry data and information specific to these pipelines, the IPPSS conservatively calculated the frequency of a failure of these pipelines which could pose a hazard to the plant as about  $5 \times 10^{-7}$  per year. This value, if it remains valid for this examination is less than  $1 \times 10^{-6}$  and would allow this event to be screened out.*

Please provide the regulatory basis for these values. These values appear only to consider the probability of an event and not the risk and/or consequences of the event considering the location of Indian Point and the population density along with the vital infrastructure of New York City.

The value of  $5 \times 10^{-7}$  per year is unsupported and the assumption appears to be in direct conflict with the analysis conducted by Framatome in 2004.

5. Please explain the apparent discrepancies between the 2004 Framatome ANP<sup>11</sup> study and the alleged Indian point analysis that concludes:

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<sup>11</sup> “Natural Gas Pipeline Hazard Risk Determination,” by J. H. Snooks. (ML042040266)

*“A postulated rupture of the gas pipeline near the NEF could pose the following the hazards:*

- *Overpressure on plant structures due to shock waves generated by detonation or explosion of the gas cloud from mixing of the released gas and the atmosphere.*
- *Impact by missiles propelled by air bursts from detonation or explosion of the gas cloud.*
- *Radiant heat flux on plant structures due to combustion of the gas/air mixture in the gas cloud.*

*A hazard model estimated the likelihood of a gas line rupture and the subsequent hazards that could impact NEF plant operations. The yearly probability of these hazards is  $9.44 \times 10^{-6}$  /year. **Therefore, the event is considered credible in accordance with NUREG-1520 (Reference 1).**”*

Since the NEF evaluation, which concludes there is a credible hazard, is publicly available in ADAMS, there seems no basis for NRC to withhold any IP evaluation. Entergy should make its similar evaluation available within ADAMS.

6. Affirm that the onsite fire brigade and off-site responders are aware of the potential dangers of this gas line explosion and Indian Point has written procedures describing actions to deal with a potential explosion and immediately terminate the source of fuel.
7. Confirm that these buried gas lines are within the scope of Indian Point’s buried pipe inspection program.
8. Spectra Energy is in the process of construction of new gas lines in New York/New Jersey. Please confirm that these changes will be considered under the requirements of 10 CFR 50.59 for possible impact on the Indian Point operations.

The gas pipelines located within the Indian Point complex represents a clear and present danger that the NRC refuses to consider, even though the NRC’s own analysis recognizes the possibility of a gas line explosion as a credible event with unanalyzed consequences.

The NRC’s own records clearly demonstrate that the Indian Point plants are not and have not been in compliance with past or present regulations. The Indian Point initial license was based upon information and automatic protection systems that have been removed without any apparent analysis as clearly required by NRC regulations.

The gas transmission line(s) have been in service for more than 50 years. Demand for natural gas has and will continue to increase thereby adding to the probability of a

catastrophic event. With age, corrosion, and higher flow rates the gas lines will also continue to weaken increasing the probability of a major rupture similar to the San Bruno event and the recent explosions in Texas, Connecticut, and Oklahoma and numerous other locations.

It has long been my contention, and that of other industry watchdogs that the relationship between the NRC and the industry that it is supposed to regulate is far too cozy—similar to the relationship between the US Minerals Management Service and the oil industry that recently led to the Gulf oil disaster.

This situation appears to be one more example of a regulatory agency (NRC) failing to properly identify potential hazards and failure to enforce regulations to preclude further disasters such as the Gulf Oil rupture and the San Bruno gas explosion. These two disasters this year are minor compared to the possible devastation caused by a natural gas explosion/fire occurring on a multiple unit nuclear power plant site, Indian Point.

I have made every possible effort to resolve this issue in non-public dialog with the NRC Chairman's Office, and the NRC's Region 1 Administrator only to be told that I am not entitled to this information.

I am calling upon the NRC, therefore, to do the job it is mandated by Congress; ensure public safety even if it is at Entergy's expense in order to prevent major disaster to the more than 20 million residents in the surrounding areas.

Respectfully submitted,

A handwritten signature in black ink that reads "Paul M. Blanch". The signature is written in a cursive, flowing style.

Paul M. Blanch  
135 Hyde Rd.  
West Hartford, CT 06117  
Office 860-236-0326  
Cell 860-922-3119

Congressman Edward Markey  
Congressman John Hall  
Senator Kirsten Gillibrand  
Congressman Peter Welch

Senator Charles E. Schumer  
Senator Joseph Lieberman

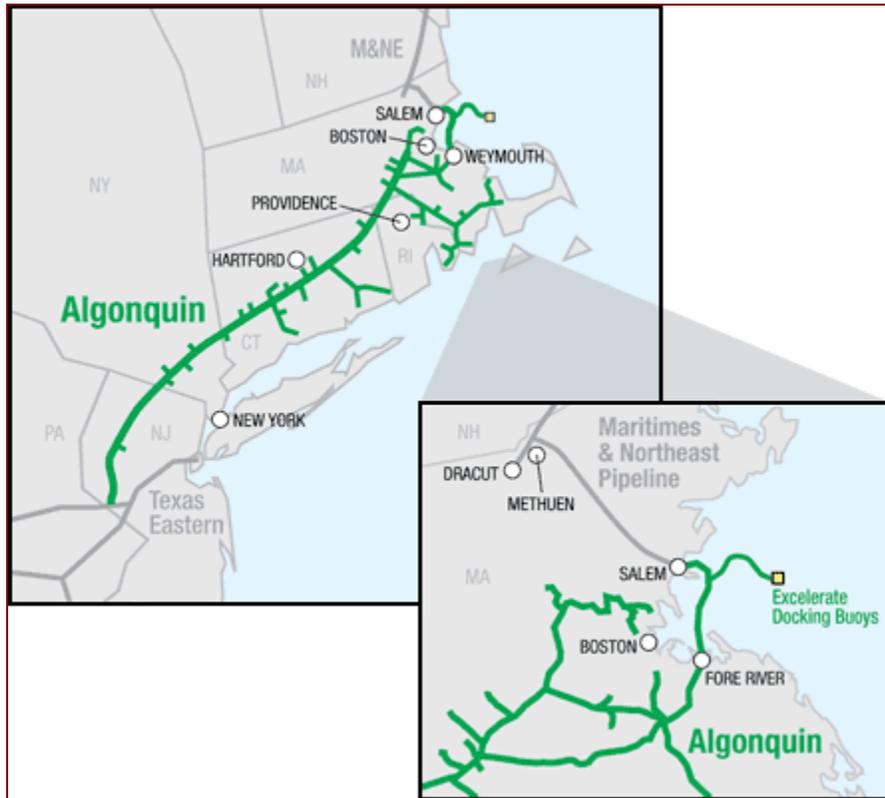
### Algonquin Gas Transmission

Length: 1,120 miles

Capacity: 2.44 billion cubic feet per day

Ownership Interest: 100 percent Spectra Energy Transmission

Operator: Spectra Energy Transmission



The Algonquin Gas Transmission pipelines transport 2.44 billion cubic feet of gas per day through 1,100 miles of pipeline. Algonquin connects to [Texas Eastern Transmission](#) and [Maritimes & Northeast](#). Its peak day design capacity enables us to offer abundant and reliable natural gas at competitive rates.

**Figure 1**  
**From Spectra Energy**



**Figure 2<sup>12</sup>**

**Indian Point site looking north**

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<sup>12</sup> All photos represent the Indian Point condition in June 2010



**Figure 3**  
**Indian Point from Hudson River**



**Figure 4**

**Spent fuel casks viewed from Hudson River**



**Figure 5**

**Gas Lines exiting east bank of Hudson River**



**Figure 6**

**Path of Gas lines through site from Hudson River to Connecticut**



**Figure 7**

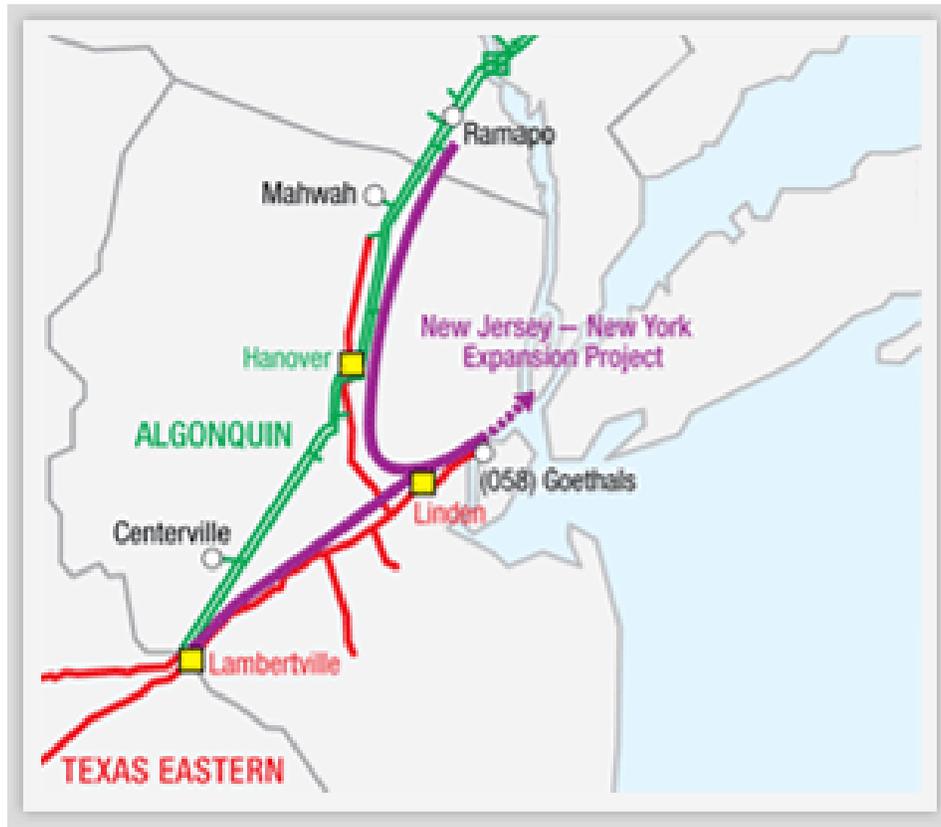
**Apparent fuel storage tank adjacent to gas lines**



**Figure 8**

**Excavation and repair of Gas and City Water lines**

**Due to buried pipe stray current corrosion**



**Figure 9**

**Proposed expansion of gas transmission system**



**Figure 10**  
**Indian Point site overview showing**  
**Path of gas transmission line**

Monday, October 15, 2012

1412 Dial Court  
Springfield, IL 62704

Senator Joseph Lieberman, Chairman  
U.S. Senate Committee on Homeland Security & Governmental Affairs  
706 Hart Office Building  
Washington, DC 20510

Dear Senator Lieberman:

On September 18, 2012 I sent a letter to the Chairman of the US Nuclear Regulatory Commission concerning the NRC's handling of a safety concern regarding Jocassee Dam and the Oconee Nuclear Station. I copied the letter to a member of your Homeland Security & Governmental Affairs Committee staff as well as to the majority and minority staffs of other Senate and House committees who I believed might be interested.

It has been nearly four weeks since I sent my letter and have not heard from either the NRC Chairman's office or the NRC Office of the Inspector General. The only official communication I have received from the NRC was my branch chief informing me that he was directed to fill out a Form 183 for me failing to stamp my 2012-09-18 letter as "Official Use Only – Security-Related Information".

I am reaching out to your committee because I have several concerns which I believe the NRC is incapable of addressing.

For over 18 years the NRC has been aware that the flood wall surrounding the Standby Shutdown Facility at Oconee Nuclear Station is too short to protect the SSF from a failure of Jocassee Dam.<sup>1</sup>

Beginning in [2006](#)<sup>2</sup> (and possibly earlier) staff personnel at the NRC recognized that a failure of Jocassee Dam could result in a nuclear accident at Oconee station.

Although I have seen no documents indicating that there is a security concern associated with the failure of Jocassee Dam, since 2007 all NRC correspondence concerning Jocassee Dam has been stamped "Official Use Only – Safety-Related Information" so it is obvious to me that for at least the past five years the US NRC has believed there is a security concern associated with Jocassee Dam.

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<sup>1</sup> Letter from Albert F. Gibson, NRC, to J. W. Hampton, Duke, "Notice of Violation and Notice of Deviation (NRC Inspection Report Nos. 50-269/93-25, 50-270/93-25, and 50-287/93-25)," dated February 11, 1994

<sup>2</sup> Letter from Charles Casto, NRC, to Bruce H. Hamilton, Duke, "IR 05000269-06-016, IR 05000270-06-016, IR 05000287-06-016, on 03/31/2006, Oconee Nuclear Station - Preliminary White Finding," dated August 31, 2006

I do not work in nuclear security and I know little about it. It is my understanding that for the commercial nuclear industry the NRC has determined the maximum credible threat with which a nuclear plant might be challenged, and the NRC requires the commercial nuclear reactors which it regulates to adequately guard their plant against such a threat.

It stands to reason that if, as evident from the way the NRC is stamping information regarding Jocassee Dam, there is a credible threat to Jocassee Dam then, because of the danger a failure of Jocassee Dam poses to flooding of the Standby Shutdown Facility at the Oconee Nuclear Station, access to Jocassee Dam should be guarded against the same design basis threat to which the Oconee Nuclear Station and other reactor plants are guarded. I respectfully request that the Senate Committee on Homeland Security & Governmental Affairs verify that the NRC is ensuring access to Jocassee Dam is adequately guarded.

Aside from external terrorist attacks, commercial nuclear reactor plants are required to guard against internal sabotage. Personnel at commercial nuclear facilities are required to receive extensive background checks and, depending on their access to vital areas, are also required to undergo periodic reassessment including interviews with psychologists.

Due to the danger a failure of Jocassee Dam poses to the Oconee Nuclear Station, it stands to reason that the security, operations and maintenance personnel at the Jocassee Dam pumped storage station should be held to the same background checks and periodic reassessments as similar personnel at the Oconee Nuclear Station and other reactor plants. I respectfully request that the Senate Committee on Homeland Security & Governmental Affairs verify that the NRC is ensuring personnel with access to the pump storage plant at Jocassee Dam are adequately screened for insider threats.

As mentioned above, the US NRC decided 5 years ago (since at least 2007) that there is at least enough of a credible security threat to Jocassee Dam to justify withholding from the public all safety related concerns regarding the dam. Although five years is more than enough time to adequately guard Jocassee Dam, the NRC continues to stamp all safety concerns regarding the dam as "Official Use Only – Security-Related Information". This indicates to me that, after five years, the NRC has not been able to adequately ensure the security of Jocassee Dam. This is not surprising to me since the NRC does not regulate Jocassee Dam and therefore has no authority to dictate security measures required there.

As a pumped storage impoundment dam, Jocassee Dam is regulated by the Federal Energy Regulatory Commission (FERC). I know little about FERC, but it is my understanding that FERC does not require the facilities it regulates to be guarded against the same design basis threats that commercial nuclear reactors are guarded against. Although FERC's security requirements are likely adequate for most of the facilities it regulates, in the case of a pumped storage dam whose sabotage is assumed to result in a nuclear accident the only adequate course of action is to require a level of security capable of guarding against a threat equivalent to the design basis threat assumed for commercial nuclear facilities.

Similarly for internal sabotage, FERC's regulations should require that the background checks and periodic reassessments conducted at the Lake Jocassee Dam pumped storage station are equivalent to those conducted at commercial nuclear facilities.

However, I am not sure it is reasonable to expect FERC to be able to treat the Lake Jocassee Dam differently from the other facilities it regulates. FERC might not have the expertise, budget or staffing levels to (1) write the regulations for the Lake Jocassee guard force, (2) periodically inspect the guard force including "Force on Force" exercises, (3) write the regulations for the background checks and periodic reassessments, (4) ensure the background checks were done adequately, and (5) inspect and regulate the periodic reassessment program of the plant personnel including psychological evaluations.

It is apparent to me that during the past five years the NRC has been unable to coordinate with FERC to ensure that the perceived security vulnerability regarding Jocassee Dam has been addressed. Despite this, the three reactors at the Oconee Nuclear Station continue to operate.

In June 2010, the NRC issued Duke Energy a Confirmatory Action Letter (CAL) requiring Duke to upgrade the flood protections at the Oconee Nuclear Station such that by November 30, 2011 the flood barriers adequately protect the equipment at the Standby Shutdown Facility against a failure of Jocassee Dam. This deadline has since been moved to 2016. So for another three or four years Duke Energy is going to be allowed to operate the three reactors at its Oconee Nuclear Station with a perceived security liability unaddressed. This is unacceptable.

If there is truly a security liability posed by Jocassee Dam, Duke Energy can literally address it within hours. Lake Jocassee and Lake Keowee (the lake which Jocassee drains to) are pumped storage impounds. Within a matter of hours, Duke Energy can lower the volume of water impounded by the Lake Jocassee and Lake Keowee Dams such that in the event of a failure of the Jocassee Dam the remaining volume of water impounded will not overtop the inadequately sized flood fall surrounding the Standby Shutdown Facility at the Oconee Nuclear Station.

There is also another solution to the security concern: shut down the three reactors at the Oconee Nuclear Station until the flooding defenses surrounding the Standby Shutdown Facility are adequately improved.

It is understandable that the NRC cannot address the perceived security vulnerabilities at Jocassee Dam since it does not regulate Jocassee Dam. However, the NRC regulates the Oconee Nuclear Station and it is unconscionable that for five years the NRC has suspected a grave security concern and has not addressed it by requiring the three reactors at the Oconee Nuclear Station to be shutdown as long as the volume of water impounded in Lakes Jocassee and Keowee pose a security threat to those reactors. And it is equally unconscionable that the NRC is going to allow this condition to continue for an additional three or four years.

I am not convinced that there is a credible security concern regarding Jocassee Dam. Obviously, all manmade structures can be demolished. But that fact in and of itself does not cause a security threat to exist. For a security threat to exist, the minimum required threat to the structure needs to be less than the maximum credible threat. As mentioned above, the maximum credible threat to the Lake Jocassee Dam is – or should be – assumed to be equivalent to the design basis threat for Oconee Nuclear Station. But what is the minimum required threat to jeopardize the integrity of the dam? Is it a half dozen drunken teenage vandals with some stolen dynamite and a canoe? Or is it a platoon of trained underwater demolition experts from a technologically advanced nation-state?

I do not know enough about dam construction, terrorism or demolition to say what the minimum required threat to Jocassee Dam is. If it is less than (e.g. teenage vandals) or equal to (e.g. a well-armed squad of terrorists) the design basis threat for the Oconee Nuclear Station, then I agree with the NRC that there is a security concern with the Lake Jocassee Dam. If, however, it is greater than the design basis threat for the Oconee Nuclear Station (e.g. underwater demolition experts from the CIA, KGB, Mossad or MI6), then I do not believe there is a credible threat to Jocassee Dam.

I respectfully request the following from the Senate Committee on Homeland Security & Governmental Affairs:

1. Ensure that after five years of assuming there is a security threat to Jocassee Dam, the NRC has adequately assessed the minimum required threat capable of jeopardizing the integrity of the Lake Jocassee Dam.
2. If the minimum required threat capable of jeopardizing the integrity of the Lake Jocassee Dam is greater than the design basis threat for the Oconee Nuclear Station, then request the NRC to cease withholding from the public the correspondence, memos and studies concerning the safety liabilities which a failure of the Lake Jocassee Dam poses to the Oconee Nuclear Station.
3. If the minimum required threat capable of jeopardizing the integrity of the Lake Jocassee Dam is less than or equal to the design basis threat for the Oconee Nuclear Station, then request the NRC to ensure the three reactors at the Oconee Nuclear Station are in a shutdown condition whenever the combined volume of water impounded by the Jocassee and Keowee Dams is great enough to pose a flooding threat to the Oconee Nuclear Station in the event of a failure of Jocassee Dam.

Enclosed with this letter is a list of the correspondence, memos and studies concerning the safety liabilities posed by a failure of the Lake Jocassee Dam. Most of these documents have been stamped by the NRC as “Official Use Only – Security-Related Information” despite not containing any discussion of security concerns. It is my perception that the “security-related” concerns are merely assumed to exist; however it is possible that the NRC has done an actual assessment that shows there is a credible security threat to the dam. If this is the case, then it is unconscionable that in five years the NRC has not done anything to prevent the operation of the three reactors at ONS while an unaddressed vulnerability to their security remains outstanding.

Copied on this letter are several industry groups and government watchdog organizations. There are some within the Nuclear Regulatory Commission who will claim that it is irresponsible for me to share the information in this letter with members of the public. To them I would note that there is nothing in this letter – other than the list of documents enclosed – that is not already public knowledge. With regard to the list of documents enclosed, although these documents are stamped “Official Use Only – Security-Related Information”, I do not believe that the mere mention of the existence of these documents constitutes the release of “Security-Related Information”.

I have copied politically active organizations on this letter because I believe their participation is vital to the proper functioning of our democratic and republican processes. Although it might not be appropriate to release specific information to these organizations from documents stamped “Security-Related Information”, merely informing them that after five years the NRC has failed to adequately address a perceived security threat from the Lake Jocassee Dam is certainly within my rights as a citizen and my duties as a licensed professional engineer.

Very respectfully,



Lawrence S. Criscione, PE

573-230-3959

[LSCriscione@hotmail.com](mailto:LSCriscione@hotmail.com)

Enclosure – 5 pages

Cc: Senator Susan Collins, Ranking Member, Homeland Security & Governmental Affairs  
Senator Richard Durbin, Illinois  
Congressman Pete King, Chairman, Homeland Security  
Congressman Bennie Thompson, Ranking Member, Homeland Security  
Congressman Fred Upton, Chairman, Energy & Commerce  
Congressman Henry Waxman, Ranking Member, Energy & Commerce  
Chairman Allison Macfarlane, US Nuclear Regulatory Commission  
Special Counsel Carolyn Lerner, US Office of Special Counsel  
Michael Corradini, American Nuclear Society  
Admiral James Ellis, Institute of Nuclear Power Operations  
Leslie Barbour, Nuclear Energy Institute  
David Lochbaum, Union of Concerned Scientists  
Scott Amey, Project on Government Oversight  
Louis Clark, Government Accountability Project  
Ken Bunting, National Freedom of Information Coalition  
Tyson Slocum, Public Citizen Energy Program  
Jim Riccio, Greenpeace

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
1994-FEB-11		Letter from Albert F. Gibson, NRC, to J. W. Hampton, Duke, "Notice of Violation and Notice of Deviation (NRC Inspection Report Nos. 50-269/93-25, 50-270/93-25, and 50-287/93-25)," dated February 11, 1994
1994-MAR-14		Letter from J. W. Hampton, Duke, dated March 14, 1994
1994-OCT-6		Internal NRC memo documenting a meeting between Region II and NRR concerning a hypothetical Jocassee Dam failure.
1994-DEC-19		Letter from Albert F. Gibson, NRC, to J. W. Hampton, Duke, "Notice of Violation and Notice of Deviation (NRC Inspection Report Nos. 50-269/94-31, 50-270/94-31, and 50-287/94-31)," dated December 19, 1994
2000-MAR-15		Letter from David E. LaBarge, NRC, to W. R. McCollum, Jr., "Oconee Nuclear Station, Units 1, 2, and 3 Re: Review of Individual Plant Examination of External Events (TAC Nos. M83649, M83650, and M83651)," dated March 15, 2000
2006-APR-28	<a href="#">ML061180451</a>	OCONEE NUCLEAR STATION - INTEGRATED INSPECTION REPORT 05000269/2006002, 05000270/200602, 05000287/2006002
2006-AUG-31	<a href="#">ML080780143</a>	IR 05000269-06-016, IR 05000270-06-016, IR 05000287-06-016, on 03/31/2006, Oconee Nuclear Station - Preliminary White Finding
2006-OCT-5	ML062890206	Oconee, Units 1, 2 & 3 - Response to Preliminary White Finding
2006-NOV-22	<a href="#">ML063260282</a>	IR 05000269-06-017, IR 05000270-06-017, IR 05000287-06-017, Final Significance Determination for a White Finding and Notice of Violation, Duke Energy Carolinas, LLC
2006-DEC-20	ML063620092	Oconee, Units 1, 2, & 3, Appeal of Final Significance Determination for White Finding and Reply to Notice of Violation; EA-06-199
2007-JAN-29	ML070440345	Summary of Revised Fragility Evaluation Results for Jocassee Dam
2007-FEB-5		Letter from Bruce H. Hamilton, Duke, to NRC, "Seismic Fragility Study"
2007-FEB-22	ML070590329	Manual Chapter 0609.02 Appeal Panel Recommendations (Oconee Reply to a Notice of Violation and White Finding (EA-06-199))
2007-MAR-1	ML070610460	Oconee Appeal Panel Review of Manual Chapter 0609.02 Appeal Panel Review of Oconee Standby Shutdown Facility White Finding (EA-06-199)
2007-MAY-3	ML072970510	Oconee, Units 1, 2 and 3 - Request for NRC to Review Appeal of Final Significance Determination for SSF Flood Barrier White Finding
2007-JUN-22	ML071580259	Consideration of New Information Associated with a Final Significance Determination for a White Finding - Oconee NS
2007-JUN-28		Phone call between the NRC and Duke Energy
2007-OCT-1	ML072770765	10/01/2007, Slides with Notes for Final Regulatory Assessment of Oconee Flood Barrier Issue
2007-OCT-1	ML072770775	Dam Failure Information
2007-OCT-1	ML072770777	Questions and Answers Related to Oconee Flood Barrier
2007-NOV-20	ML073241045	Reconsideration of Final Significance Determination Associated with Standby Shutdown Oconee Facility Flood Barrier White Finding
2008-MAY-19	ML081350689	Briefing Package For Drop-In Visit By Duke Energy Chief Nuclear Officer With Chairman Klein And Commissioner Jaczko On May 21, 2008
2008-JUN-23	ML082390669	Proposal for a Risk Analysis of the Failure of the Jocassee and Keowee Dams to Assess the Potential Effects on the Safe Shut Down Facility of the Oconee Nuclear Station, South Carolina
2008-JUL-28	ML082120390	Oconee Nuclear Station - Revisions to the Selected Licensee Commitments Manual (SLC)

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2008-AUG-15	ML081640244	Information Request Pursuant to 10 CFR 50.54(F) Related to External Flooding, Including Failure of the Jocassee Dam at Oconee Nuclear Station, Units 1, 2, and 3 (TAC Nos. MD8224, MD8225, and MD8226)
2008-AUG-26	ML082390690	Kick Off for Risk Analysis of the Failure of the Jocassee and Keowee Dams to Assess the Potential Effects on the Safe Shutdown Facility at the Oconee Nuclear Station
2008-AUG-28	ML083300427	08/28/2008 - Summary of Closed Meeting to with Duke Energy Carolinas, LLC to Discuss the August 15, 2008, 50.54(f) Letter on External Flooding (TAC Nos. MD8224, MD8225, and MD8226)
2008-AUG-28	ML082550290	Meeting with Duke Energy Carolinas, Oconee Flood Protection and the Jocassee Dam Hazard
2008-SEP-6	ML082250166	Oconee Nuclear Station - Communication Plan for Information Request Related to Failure Frequencies for the Jocassee Pumped Storage Dam (Jocassee Dam) at the Oconee Nuclear Station and Potential Generic Implications
2008-SEP-26	ML082750106	Oconee, Units 1, 2 and 3 - Response to 10 CFR 50.54(f) Request
2008-NOV-5	ML091060761	11/05/08 Summary of Closed Meeting with Duke on External Flooding Issues, including failure of the Jocassee Dam, at Oconee Nuclear Station, Units 1, 2, and 3
2008-NOV-5	ML083390650	11/05/2008 Meeting Slides, "Oconee Site Flood Protection," NRC Meeting with Duke Energy Carolinas, LLC
2008-DEC-4	ML091420319	12/04/2008 Meeting Summary, Meeting to Discuss External Flooding at Oconee Nuclear Station (Reissuance, with Error on Page 3 Corrected)
2008-DEC-4	ML090480044	Oconee Nuclear Station, External Flood NRR Meeting, Rockville, MD, December 4, 2008
2009-FEB-3	ML090280474	Briefing Package for Commissioner Lyons Visit to Oconee on February 4, 2009
2009-APR-6	ML091170104	Oconee Nuclear Station, Units 1, 2 And 3 - Non-concurrence on Evaluation of Duke Energy Carolinas, LLC September 26, 2008, Response to Nuclear Regulatory Commission Letter Dated August 15, 2008 Related to External Flooding
2009-APR-9	ML091030172	Oconee External Flooding Briefing for Commissioner Jaczko
2009-APR-30	ML090570779	Oconee Nuclear Station Units 1, 2, and 3, Evaluation of Duke Energy Carolinas September 26, 2008, Response to External Flooding, Including Failure of the Jocassee Dam
2009-MAY-11	ML092940769	05/11/2009 Summary of Closed Meeting with Duke Energy Carolinas, LLC, to Discuss Preliminary Results of the Recent Inundation and Sensitivity Studies Concerning Failure of the Jocassee Dam and Resultant Flooding at Oconee Nuclear Station, 1, 2, and 3
2009-MAY-11	ML090820470	5/11/2009 Notice of Forthcoming Closed Meeting with Duke Energy Carolinas, LLC, to Discuss Sensitivity Studies Concerning Failure of the Jocassee Dam & Resultant Flooding at the Oconee Nuclear Station, Unit 1, 2, & 3
2009-MAY-11	ML091380424	Oconee Nuclear Station, Slides for Closing Meeting May 11, 2009 with Duke on the Oconee Flooding Issue
2009-MAY-20	ML091470265	Oconee, Units 1, 2 & 3, Request for Extension of Duke Response Time to Referenced Letter
2009-MAY-26	ML091480116	E-mail re Briefing Package for Visit to Jocassee Dam on June 23, 2009
2009-JUN-1	ML091590046	Oconee, Units 1, 2, and 3, Request to Withhold Sensitive Information in Presentation Materials Left with Staff
2009-JUN-10	ML091680195	Oconee, Units 1, 2, and 3 - Interim 30-Day Response to Reference 2.

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2009-JUN-11	ML091620669	6/11/09 Summary of Closed Meeting with Duke Carolina to Discuss External Flooding at Oconee
2009-JUN-25	ML091760072	NRC Site Visit to the Oconee Nuclear Station on June 15, 2009
2009-JUL-9	ML092020480	Oconee, Units 1, 2, & 3, Final 60-Day Response to Reference 2
2009-JUL-28	ML092230608	Oconee, Submittal of Selected Licensee Commitments Manual SLC Revision
2009-AUG-12	ML090570117	Oconee Flood Protection and the Jocassee Dam Hazard Basis for NRC Allowing Continued Operation
2009-AUG-27	ML092380305	Oconee, Slides for Closed Meeting Regarding External Flood Technical Meeting On August 27, 2009
2009-SEP-25	ML092710344	Site Visit Observation on 09/25/2009 by Joel Munday for Oconee
2009-OCT-28	ML093080034	10/28/09 Slides for Oconee Nuclear Station, Units 1, 2, and 3 - Meeting Slides - External Flood NRC Technical Meeting
2009-NOV-30	ML093380701	Oconee Nuclear Station, Units 1, 2, and 3, Oconee External Flood Analyses and Associated Corrective Action Plan
2009-DEC-4	ML090680737	12/04/09 Summary of Closed Meeting to Discuss the Duke Energy Carolinas, LLC., 09/26/08 Response to NRC's August 15, 2008 50.54(f) Letter on External Flooding at Oconee
2010-JAN-6	ML100280954	01/06/2010 Briefing to the Executive Team on the Oconee Nuclear Station External Flooding Issue
2010-JAN-11	ML100150066	Request Additional Information Regarding the Oconee External Flooding Issue
2010-JAN-15	ML100210199	Oconee, Units 1, 2 and 3 - Additional Information Regarding Postulated External Flood Threat Issues
2010-JAN-29	ML100271591	Evaluation of Duke Energy Carolina, LLC (Duke), November 30, 2009, Response to Nuclear Regulatory Commission (NRC) Letter Dated April 30, 2009, Related to External Flooding At Oconee Nuclear Station, Units 1, 2, And 3 (Oconee)
2010-FEB-8	ML100470053	Oconee, Units 1, 2, & 3, External Flood, Response to Request for Additional Information
2010-FEB-26	ML100610674	Oconee, Units 1, 2, & 3, External Flood Revised Commitment Letter
2010-MAR-5	ML103430047	Oconee Nuclear Station, Units 1, 2, & 3, Letter From Duke Energy Carolinas, LLC Regarding External Flood, Response to Request For Additional Information
2010-MAR-15	ML100780084	Generic Failure Rate Evaluation for Jocassee Dam Risk Analysis
2010-MAR-18	ML100810388	Prepare Briefing Book and Material for Eric Leeds for the Duke Fleet Meeting on March 18, 2010
2010-APR-14	ML100760109	Generic Failure Rate Evaluation for Jocassee Dam
2010-MAY-27	ML101600468	Oconee, Units 1, 2 & 3, Response to Requested Information on the Protection Against External Flooding Including a Postulated Failure of the Jocassee Dam
2010-JUN-1	ML101750619	OOU - Communication Plan For Issuance of Confirmatory Action Letter To Duke For Oconee - External Flooding June 2010
2010-JUN-3	ML101610083	Oconee Nuclear Station, Units 1, 2, and 3, - External Flood Commitments
2010-JUN-22	ML101730329	Oconee, Units 1, 2 & 3, Confirmatory Action Letter (CAL 2-10-003), Commitments to Address External Flooding Concerns
2010-JUN-29	ML101890803	06/29/2010 Summary of Closed Meeting With Duke Energy Carolinas, LLC, to Discuss External Flooding at Oconee
2010-JUL-7	ML101880768	OOU - IR 05000269-10-002, 05000270-10-006, 05000287-10-006; 01/01/2010 - 03/31/2010; Oconee Nuclear Station Units 1, 2 and 3; Interim Compensatory Measures for External Flood
2010-JUL-19	ML101900305	Identification of a Generic External Flooding Issue Due to Potential Dam Failures

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2010-AUG-2	ML102170006	Oconee Units 1, 2, & 3, Response to Confirmatory Action Letter (CAL) 2-10-003
2010-OCT-20	ML102910480	NRC Assessment of Oconee External Flooding Issue (October 18, 2010)
2010-OCT-26	ML102990064	NRC Staff Assessment of Duke Energy Carolinas, LLC, Oconee External Flooding Issue (TAC NOS. ME4441, ME4442, and ME4443)
2010-NOV-29	ML103490330	Oconee Nuclear Site, Units 1, 2, and 3, Oconee Response to Confirmatory Action Letter (CAL) 2-10-003
2011-JAN-5	ML110180609	Enclosure 1, Oconee Nuclear Station, Major Project Plans
2011-JAN-10	ML110260443	Non-concurrence on Oconee Assessment Letter
2011-JAN-28	ML110280153	Staff Assessment of Duke's Response to Confirmatory Action Letter Regarding Duke's Commitments To Address External Flooding Concerns At The Oconee Nuclear Station, Units 1, 2, And 3 (ONS) (TAC NOS. ME3065, ME3066, and ME3067)
2011-MAR-5	ML103410042	Supplement to Technical Basis for Allowing Oconee Nuclear Station to Remain in Operation Through November 2011, Associated with the External Flooding Issues
2011-MAR-15	ML110740482	Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures
2011-APR-29	ML111460063	Oconee Nuclear Site, Units 1, 2, and 3, Response to Confirmatory Action Letter (CAL) 2-10-003
2011-AUG-16	ML11229A710	E-mail re Briefing Package for Visit to Oconee Nuclear Power Plant on September 12-13, 2011
2011-AUG-18	ML11174A138	Oconee Nuclear Station, Units 1, 2, and 3, Assessment of Duke Energy Carolinas, LLC April 29, 2011, Response to Confirmatory Action Letter Regarding Modifications to Address External Flooding Concerns (TAC Nos. ME6133, ME6134, and ME6135)
2011-AUG-31	ML112430114	Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures
2011-SEP-1	ML11244A024	Briefing Package for Visit to Oconee Nuclear Power Plant on September 12-13, 2011
2011-OCT-3	ML11278A173	Oconee Nuclear Station (ONS), Units 1, 2, and 3, Response to Requests for Additional Information Regarding Necessary Modifications to Enhance the Capability of the ONS Site to Withstand the Postulated Failure of the Jocassee Dam
2011-OCT-17	ML11294A341	Oconee Nuclear Station (ONS), Units 1, 2, and 3, Response to Requests for Additional Information Regarding Necessary Modifications to Enhance the Capability of the ONS Site to Withstand the Postulated Failure of the Jocassee Dam
2011-DEC-16	ML113500495	Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures_redacted
2012-JAN-26	ML12026A549	Briefing Package for Commissioner Svinicki Visit to Oconee on February 1, 2012
2012-JAN-31	ML12026A254	Communication Plan for Oconee Nuclear Station (ONS) Following Issuance of GI-204
2012-FEB-3	ML12039A239	Oconee, Units 1, 2 and 3 - Request for Withholding from Public Disclosure Duke Energy Letter Dated May 20, 2009 Involving Postulated Failure of the Jocassee Dam
2012-FEB-9	ML12039A217	Briefing Package Request for Meeting with Duke Energy on February 16, 2012

## List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2012-FEB-17	ML12053A016	Duke Energy Carolinas, LLC - Recommended Revisions to the Oconee Nuclear Station Section of NRC's Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Plant Sites Following Upstream Dam Failure
2012-FEB-23	ML12058A236	02/23/12 Summary of a Teleconference between the US NRC and Duke Energy Regarding Comments made by Duke Energy Concerning the Issuance of the Screening Analysis Report for Generic Issue 204
2012-MAR-5	<a href="#">ML090510269</a>	NRC Information Notice 2012-002 Potentially Nonconservative Screening Value For Dam Failure Frequency In Probabilistic Risk Assessments
2012-MAY-15	ML12129A186	Oconee Nuclear Station, Units 1, 2, and 3 - Request for Additional Information Regarding Modifications to Address the External Flooding Concerns (TAC NOS. ME7970, ME7971, AND ME7972)
2012-JUN-14	ML12167A372	Oconee, Units 1, 2, and 3, Response to Requests for Additional Information Regarding Modifications to Address External Flooding Concerns
2012-JUL-11	ML12215A327	07/11/2012 Licensee Non-Public Meeting Slides on Oconee External Flood Mitigation
2012-JUL-11	<a href="#">ML12188A071</a>	Briefing Package for Meeting with Duke Energy on July 11, 2012
2012-AUG-7	<a href="#">ML12206A325</a>	Briefing Book for Meeting with Duke Energy on August 7, 2012
2012-SEP-20	ML12268A404	Communication Plan for Flooding September 2012
2012-SEP-20	ML12219A163	Oconee Nuclear Station, Units 1, 2 and 3 - Response to Questions Regarding Modifications to Address External Flooding Hazards (TAC Nos. ME7970, ME7971, AND ME7972)