

March 13, 2014

**BY FEDERAL EXPRESS AND E-MAIL**

Linda M. Baldwin  
General Counsel  
New York State Department of State  
Counsel's Office  
One Commerce Plaza, 99 Washington Street  
Albany, NY 12231-0001

**Re: New York State Department of State File #F-2012-1028  
Consistency Certification for Entergy Nuclear Indian Point 2 and  
Entergy Nuclear Indian Point 3 License Renewal Application**

Dear Ms. Baldwin:

This letter provides supplemental information requested by the New York State Department of State (the "Department") in connection with the consistency certification (the "Consistency Certification") submitted on December 17, 2012, by Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC and Entergy Nuclear Operations, Inc. (collectively, "Entergy") for Entergy's Indian Point 2 and 3 ("Indian Point") License Renewal Application pending before the Nuclear Regulatory Commission ("NRC"). During its consultation session with Entergy on December 3, 2013, the Department stated that, as a result of the impact of Hurricane Sandy on New York State coastal regions, the Department is evaluating the ability of infrastructure to withstand "extreme flooding" conditions and a potential rise in sea level. Accordingly, the Department requested Entergy to provide: (i) an analysis of flood risks affecting the Indian Point site; (ii) an analysis of how extreme flooding events relate to the Independent Spent Fuel Storage Installation ("ISFSI") at Indian Point and other elements of the plant facilities; and (iii) a description of how extreme flooding events will be addressed at Indian Point.

Entergy reiterates that it is proceeding with federal consistency review by the Department under a full reservation of its rights under state and federal law, including, by way of example and without limitation, its right to argue that: (i) Indian Point is within a "grandfathering" exemption from federal consistency review under the New York Coastal Management Plan (the "CMP"); (ii) Indian Point has been previously reviewed for consistency with the CMP; and (iii) the Department's purported federal consistency review under the CMP intrudes upon exclusive areas of federal regulatory authority and is preempted. Entergy additionally notes that the information being requested by the Department in this case was not requested by the Department in connection with its previous federal consistency reviews of

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nuclear power plants. Further, Entergy does not concede the relevance of the requested information to the Department's review of Indian Point for consistency with the CMP.

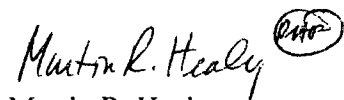
Nonetheless, detailed information has already been prepared for NRC to demonstrate the safety of Indian Point under extreme flooding conditions. NRC directed Entergy to prepare an analysis of the effects of extreme flooding events on Indian Point facilities and operations. That report was submitted to NRC by Entergy on December 23, 2013, (the "Flooding-Hazard Report")<sup>1</sup> and remains under review by NRC. As part of NRC's ongoing review of safety at Indian Point, NRC may request supplemental information and/or analysis from Entergy with respect to the Flooding-Hazard Report, including information on Entergy's state-of-the-art probabilistic surge analysis for Indian Point. We will keep the Department informed as additional analysis and information on extreme flooding is prepared for NRC as part of NRC's ongoing review process. However, the Flooding-Hazard Report represents the most current information now available with respect to the extreme flooding issues being addressed by NRC, and is submitted herewith as supplemental information in support of the Consistency Certification.

In addition, to assist the Department with application of the technical conclusions of the Flooding-Hazard Report to Indian Point, Entergy is also providing herewith a "white paper" which focuses on the specific inquiries made by the Department with respect to extreme flooding events.<sup>2</sup>

The supplemental information submitted with this letter demonstrates that Indian Point is well positioned with respect to extreme flooding events, and that concerns about infrastructure resiliency and safe operations have been, and are being, fully and adequately addressed by NRC.

We look forward to discussing this supplemental information with you at your convenience.

Sincerely,

A handwritten signature in cursive script that reads "Martin R. Healy". To the right of the signature is a circular stamp containing the word "Entergy".

Martin R. Healy

MRH

cc:

U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk (w/o the Flooding-Hazard Report)

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<sup>1</sup> Transmitted by letter dated December 23, 2013, from John A. Ventosa, Site Vice President, Administration, Entergy Nuclear Northeast to Nuclear Regulatory Commission re: Entergy's Required Response for NTTF Recommendation 2.1: Flooding-Hazard Reevaluation Report, NL-13-156 (ADAMS Accession No. ML13364A005).

<sup>2</sup> See enclosed Response to New York State Department of State Request for Supplemental Information Regarding Potential Impacts of Extreme Flooding Conditions at Indian Point.

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Douglas V. Pickett, Senior Project Manager, NRC NRR DORL (w/o the Flooding-Hazard Report)  
William M. Dean, Regional Administrator, NRC Region 1 (w/o the Flooding-Hazard Report)  
NRC Resident Inspectors Office (w/o the Flooding-Hazard Report)  
William Sharp, Principal Attorney (w/encl.)  
Kari Gathen, Associate Attorney (w/encl.)  
Jeffrey Herter, Assistant Bureau Chief, Division of Development (w/encl.)  
Gregory Capobianco, Director, Division of Development (w/encl.)  
Jeffrey Zappieri, Supervisor, Consistency Review Unit (w/encl.)  
Matt Maraglio, Consistency Reviewer (w/encl.)  
Fred Dacimo, Vice President License Renewal, Indian Point Energy Center (w/encl.)  
William B. Glew, Jr., Associate General Counsel, Entergy Services, Inc. (w/encl.)  
Kelli Dowell, Assistant General Counsel, Environmental, Entergy Services, Inc. (w/encl.)  
Dara Gray, Chemistry/Environmental, Indian Point Energy Center (w/encl.)

## **Response to New York State Department of State Request for Supplemental Information Regarding Potential Impacts of Extreme Flooding Conditions at Indian Point**

### **I. Request for Supplemental Information**

On December 3, 2013, Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC and Entergy Nuclear Operations, Inc. (collectively, “Entergy”) and the New York State Department of State (the “Department”) engaged in a consultation session at which the Department requested supplemental information regarding the potential effects of extreme flooding events on Entergy’s Indian Point Units 2 and 3 (“IP2” and “IP3”). In Entergy’s letter to the Department dated December 20, 2013, Entergy undertook to provide that supplemental information on or before March 15, 2014.

### **II. Summary of Response**

IP2 and IP3, like all operating nuclear power plants, are designed and operated in accordance with strict Nuclear Regulatory Commission (“NRC”) criteria requiring, among other things, that nuclear power plants be designed to withstand the effects of natural phenomena including earthquakes, tornados, *hurricanes*, *floods*, tsunamis, and seiches without loss of capability to perform their intended safety functions. Accordingly, the design bases for IP2 and IP3 systems, structures, and components (“SSCs”) important to safety already reflect consideration of the most severe natural phenomena that have been historically reported for the site and surrounding area. The design bases also reflect margin to account for uncertainties in historical data.

Since original licensing of IP2 and IP3, the NRC has continued to review and update its regulations and regulatory guidance pertaining to natural phenomena, including updates in response to extreme external events such as the 2004 Sumatra earthquake. Most recently, in response to the accident at the Fukushima Dai-ichi nuclear power plant, the NRC conducted a systematic review of NRC processes and regulations in order to strengthen the regulatory framework for protection against natural phenomena. As a result of this review, the Commission directed several actions to ensure adequate protection of nuclear power plants from natural phenomena, including potential flooding events, consistent with current state of knowledge and analytical methods. NRC’s actions are intended to prevent fuel damage and ensure containment and spent fuel integrity and to ensure radiological safety.

As part of this effort, in March 2012, pursuant to its authority under the Atomic Energy Act of 1954, as amended, the NRC issued a letter to all power reactor licensees, including Entergy, requesting, among other things, additional information regarding flooding hazards at operating reactor sites (Reference 1). Specifically, in Recommendation 2.1, NRC requested that licensees (1) re-evaluate site-specific flooding hazards using updated information and methodologies and (2) identify actions that have been taken or are planned to address plant-specific vulnerabilities (prevention and mitigation) associated with the updated flooding hazards. NRC intends to use this information to determine if there is a need to update the design basis for SSCs important to safety to protect against updated external hazards, including flooding, and determine if additional regulatory actions or safety enhancements are warranted.

In December 2013, Entergy submitted its response to the NRC on Recommendation 2.1: Flooding-Hazard Reevaluation Report (Reference 2) (the “Flooding-Hazard Report”). As documented in that response, Entergy evaluated the eight flood-causing mechanisms required by the NRC, including storm surges, river flooding, and a combined-effects flood event. Entergy also described mitigation measures to address new flooding elevations developed by the evaluation.

Based on the Flooding-Hazard Report and existing and planned mitigating actions, Entergy demonstrated that IP2 and IP3 are protected from extreme flooding events postulated to occur *only once in 500,000 years*. Putting this in perspective, protecting the plant against the 500,000-year flood will protect and ensure the safety of Indian Point against storms and floods that could result in flooding levels in Manhattan more than 9 feet *higher* than the highest flooding levels ever recorded, including recent record-setting flooding from Hurricane Sandy (Reference 2).

In summary, NRC regulations and Indian Point’s current design basis already require that IP2 and IP3 systems, structures, and components important to safety be able to withstand the effects of natural events including flooding events. NRC and Entergy have recently taken further actions to ensure that this equipment is protected even during extreme, once-in-500,000 years, events.

Responses to the individual questions posed by the Department are provided below.

### **III. Responses to Department Questions Regarding Potential Flooding Impacts**

- a(i). What water levels did the Hudson River reach adjacent to Indian Point during hurricane Sandy?

The Hudson River water level adjacent to Indian Point reached 9 ft., 8 in. during Hurricane Sandy. Grade elevation for both IP2 and IP3 is approximately 15 ft. Therefore, even with the record-setting storm surge, the water levels were still more than 5 ft. below site grade level.

- a(ii). What elements of Indian Point would be exposed to flooding during extreme flooding conditions?

As described above, peak water levels adjacent to Indian Point during Hurricane Sandy were more than 5 ft. below grade level and, therefore, the Indian Point site did not experience flooding as a result of that event.

In response to NRC Fukushima Recommendation 2.1 (Flooding Hazard Reevaluation), Entergy evaluated the impact of numerous extreme flooding scenarios on IPEC based on state-of-the art knowledge in hurricane science, hydrology, and probabilistic methods. Entergy determined that in a combined external flood event (postulated to occur once in 500,000 years) associated with a storm surge, 25-year storm-related flooding, 10 percent exceedance tide, and coincident wind-generated wave activity, water levels could potentially exceed Indian Point grade level by 2.7 ft. (References 1 and 2). Surge duration is expected to be approximately 3 hours. (For perspective, this hypothetical extreme water level is approximately 8 ft. above maximum levels reached

during Hurricane Sandy.) But as discussed below, IPEC currently has plans in place and equipment available to protect and ensure the safety of vital SSCs at both IP2 and IP3 even at these levels, including equipment in the Turbine and Control Buildings, Intake Structures, and Service Water Valve Pits. See Reference 2 for further details.

- b. What preventive measures reasonably could be deployed at Indian Point to withstand extreme flooding conditions?

As described more fully in Reference 2, flood protection measures at Indian Point include both permanent and temporary features. The permanent features consist of door seals, dikes, exterior walls and floors of structures containing safety related SSCs, backflow prevention valves, penetration seals, and conduit seals. The temporary protection features include portable gas-powered pumps, submersible electric pumps, pre-filled sandbags, inflatable drain seals, and inflatable barriers. This equipment is available and pre-staged at appropriate locations.

Activities to mitigate the effects of external flooding events, including placement of sandbags and inflatable barriers, are controlled by Operations and Maintenance procedures. Such procedures are implemented well in advance of any actual flooding, at pre-determined river levels, upon notice of a high tide advisory, or a flood warning issued by the National Oceanic and Atmospheric Administration ("NOAA").

Before the onset of severe weather conditions, further flood protection procedures and measures are implemented. Flood protection procedures and measures are subject to NRC review and inspection.

- c. Is the ISFSI exposed to flooding during extreme flooding conditions?

No, the Indian Point ISFSI is not exposed to flooding during extreme flooding conditions. The ISFSI is located at approximately a 90 ft. elevation (75 ft. above site grade level) and includes a separate drainage system.

- d. Is Unit 2 or Unit 3 exposed to flooding during extreme flooding conditions?

See response to Question a(ii) above. In a hypothetical extreme combined external flood event, water levels may exceed site grade. As a result, certain equipment at IP2 and IP3 could be exposed to flooding during extreme flooding conditions for a short duration. Further details regarding IP2 and IP3 equipment potentially impacted by an extreme flooding event are included in Reference 2.

- d(i). If so, what precautionary measures reasonably could be taken?

See response to Question b above. Entergy already has in place procedures and permanent and temporary equipment to protect vital SSCs from the potential effects of the hypothetical extreme flooding event determined in Reference 2. Any actions necessary to protect such equipment are taken well in advance of a flooding event, based on predetermined river levels, upon notice of a

high tide advisory, or a NOAA flood warning. Further details about these actions are included in Reference 2.

## REFERENCES

1. NRC Request for Information Pursuant to Title 10 of the *Code of Federal Regulations* 50.54(f) Regarding Recommendations 2.1, 2.2, 2.3 and 9.3 of the Near-Term Task Force Review of Insights From the Fukushima Dai-ichi Accident, March 12, 2012. Recommendation 2.1 addresses seismic and flooding issues:
2. Entergy's Required Response for NTTF Recommendation 2.1: Flooding-Hazard Reevaluation Report, December 23, 2013 (NL-13-156) (ADAMS Accession No. ML13364A005).

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