UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

July 17, 2019

MEETING SUMMARY

LICENSEE: ENTERGY NUCLEAR NORTHEAST

FACILITY: INDIAN POINT UNITS 2 AND 3

SUBJECT: SUMMARY OF ANNUAL ASSESSMENT MEETING

On June 20, 2019, at 7:00 p.m., the U.S. Nuclear Regulatory Commission (NRC) conducted a public meeting at the Doubletree by Hilton in Tarrytown, N.Y., to discuss its assessment of the safety performance at Indian Point Units 2 and 3 for 2018.

A meeting notice (ADAMS Accession Number ML19156A029) was issued and posted to the NRC webpage on June 5, 2019. ADAMS is accessible from the NRC webpage at: www.nrc.gov/reading-rm/adams.html.

The NRC discussed its assessment of the safety performance for the period of January 1 through December 31, 2018, as documented in our letter dated March 4, 2019 (ADAMS Accession Number ML19060A202). Additional information on the Annual Assessment Process and Indian Point performance is available at www.nrc.gov/reactors/operating/oversight.html. Following the discussion of plant performance and other topics, including decommissioning, the NRC held a question and answer session with the public.

Members of the public, local officials, State officials, and media attended the meeting and were offered the opportunity to question the NRC regarding Entergy's performance and the role of the agency in ensuring safe plant operations. As we were unable to provide detailed answers to some questions at the meeting, the answers regarding these topics are included as an enclosure to this summary.

/RA Erin Carfang for/
Daniel L. Schroeder, Chief
Projects Branch 2
Division of Reactor Projects

Enclosures:
1. Annual Assessment Meeting Public Topics of Interest
2. NRC Staff AAM Presentation

SUBJECT: SUMMARY OF ANNUAL ASSESSMENT MEETING DATED JULY 17, 2019

DISTRIBUTION: (via email)
DSchroeder, DRP
MDraxton, DRP
BHaagensen, DRP, SRI
ASiwy, DRP, RI
JVazquez, DRP, RI
RidsNRRPMIndianPoint Resource

DOCUMENT NAME: G:\DRP\BRANCH2\Site Visits, Briefings, Meetings\Annual Assessment Meetings\2019 Annual Assessment Meetings\Indian Point\Meeting Summary\2019 IP AAM Meeting Summary final.docx
ADAMS Accession No. **ML19198A239**

☑ SUNSI Review		☑ Non-Sensitive ☐ Sensitive		☑ Publicly Available ☐ Non-Publicly Available	
OFFICE	RI/DRP	RI/DRP			
NAME	MDraxton via email	DSchroeder/ECarfang for			
DATE	7/12/19	7/17/19			

OFFICIAL RECORD COPY

Annual Assessment Meeting Public Topics of Interest

Spent Fuel Storage at Indian Point and Independent Spent Fuel Storage Installations

Both Indian Point Unit 2 and 3 were originally licensed for a maximum capacity of 264 fuel assemblies in the spent fuel pools. Since then, analyses that are more accurate and the installation of neutron absorbers have proven that the pool can safely accommodate more than the original licensed limit. Anytime a plant's owner intends to increase the capacity of its spent fuel pool beyond the licensed amount, a thorough evaluation must be conducted to ensure the continued safe storage of the material, including a review of the increased heat load and an analysis of any increased potential for safety hazards. In the case of Indian Point, this took place each time they changed the configuration of the spent fuel pools, providing assurance that the pools remained safe. The NRC independently reviewed each of the spent fuel pool evaluations and concluded that the spent fuel pools remain safe under the licensed loading limit. Currently, the Unit 2 spent fuel pool has a capacity of 1374 fuel assemblies, and the Unit 3 spent fuel pool has a capacity of 1345 fuel assemblies. Entergy has also been granted license amendments to allow spent fuel transfer from the Unit 3 spent fuel pool to the Unit 2 spent fuel pool using a transfer cask. The spent fuel in the Unit 1 spent fuel pools were removed to dry cask storage and the spent fuel pool was drained by the end of 2008.

An independent spent fuel storage installation, or ISFSI, is a facility that is designed and constructed for the interim storage of spent nuclear fuel. These facilities are licensed separately from a nuclear power plant and are considered independent even though they may be located on the site of another NRC-licensed facility. The NRC is responsible for inspection of dry cask storage. All casks undergo a safety review before they are certified for use by the NRC. Before casks are loaded, inspectors with specific knowledge of ISFSI operations assess the adequacy of a "dry run" by the licensee; they then observe initial cask loadings. The on-site resident inspectors or region-based inspectors may observe later cask loadings, and the regional offices also perform periodic inspections of routine ISFSI operations.

The Indian Point ISFSI uses the HI-STORM 100 Cask System. The HI-STORM 100 Cask System consists of the following components: (1) interchangeable multi-purpose canisters (MPCs), which contain the fuel; (2) a storage overpack (HI-STORM), which contains the MPC during storage; and (3) a transfer cask (HI-TRAC), which contains the MPC during loading, unloading, and transfer operations. The cask stores up to 32 pressurized water reactor fuel assemblies.

The MPC is a confinement system for the stored fuel. It is a welded, one half inch thick cylindrical canister with a honeycombed fuel basket, a baseplate, a lid, a closure ring, and a canister shell. The honeycombed basket, which contains neutron absorbing material, provides criticality control. The Hi-TRAC transfer cask provides shielding and structural protection of the MPC during loading, unloading, and movement of the MPC from the spent fuel pool to the storage overpack. The transfer cask is a multi-walled (carbon steel/lead/carbon steel) cylindrical vessel with a neutron shield jacket attached to the exterior. The HI-STORM 100 storage overpack provides shielding and structural protection of the MPC during storage. The overpack is a 29.5 inch thick heavy-walled steel and concrete, cylindrical vessel. Its sidewall consists of concrete that is enclosed between inner and outer carbon steel shields. The overpack has four air inlets at the bottom and four air outlets at the top to allow air to circulate naturally through the cavity to cool the MPC inside. The inner shell has supports attached to its interior surface to guide the MPC during insertion and removal, provide a medium to absorb impact loads, and allow cooling air to circulate through the overpack.

The MPC is part of an engineered system that ensures heat removal, shields radiation, and protects the spent fuel from external threats. The HI-STORM canister provides sufficient strength to ensure that the fuel is well protected against external threats and the public is well protected against radiation. This system also provides the future capability to remove the MPC for transportation to another storage location. Additional information can be found in Certificate of Compliance (CoC) 1014, Amendment 9 Revision 1 (https://www.nrc.gov/docs/ML1605/ML16056A529.html)

NRC regulations do not specify a maximum time for storing spent fuel in a pool or cask. Additionally, there is no regulatory requirement for spent fuel to remain in pools for at least five years, as long as the thermal, shielding, confinement, and criticality limits of the dry cask design can be met.

The NRC's requirements for dry cask storage can be found in 10 CFR Part 72 (www.nrc.gov/reading-rm/doc-collections/cfr/part072/), which requires all structures, systems, and components important to safety to meet quality standards for design, fabrication, and testing. Part 72 and related NRC guidance on casks and storage facilities also detail specific engineering requirements. The NRC is also responsible for issuing regulations for the packaging of spent fuel for transport during transport 10 CFR Part 71, "Packaging and Transportation of Radioactive Waste," and regulates the physical protection of commercial spent fuel in transit against malicious acts. The Department of Transportation regulates shippers of hazardous materials, including radioactive material, and oversees vehicle safety, routing, shipping papers, emergency response, and shipper training in accordance with regulations contained in Title 49 of the *Code of Federal Regulations*.

Decommissioning Funds

Before a nuclear power plant begins operations, the licensee must establish or obtain a financial mechanism, such as a trust fund or a guarantee from its parent company, to ensure there will be sufficient money to pay for the ultimate decommissioning of the facility. Each nuclear power plant licensee must report to the NRC every two years the status of its decommissioning funding for each reactor or share of a reactor that it owns. These reports are required annually during decommissioning so the NRC can ensure the funds are being used appropriately. The report must estimate the minimum amount needed for decommissioning by using the formulas found in NRC regulations. The staff performs an independent analysis of the decommissioning reports to determine whether licensees are providing reasonable "decommissioning funding assurance" for radiological decommissioning of the reactor at the permanent termination of operation.

On March 31, 2017, Entergy provided its decommissioning funding status report to the NRC. This report can be found in NRC's ADAMS with Accession Number ML17093A926. The NRC staff reviewed the information and determined that Indian Point satisfied the decommissioning funding assurance reporting requirements and had provided decommissioning funding assurance as required in the regulations under 10 CFR 50.75. NRC staff is currently reviewing the licensee's decommissioning funding status report dated March 28, 2019 (ADAMS Accession Number ML19087A318).

Post-Shutdown Decommissioning Activities Report and Decommissioning Schedule

Within 2 years after submitting the certification of permanent closure, the licensee must submit a post-shutdown decommissioning activities report (PSDAR) to the NRC. This report provides a description of the planned decommissioning activities, a schedule for accomplishing them, and an estimate of the expected costs. The report must discuss the reasons for concluding that environmental impacts associated with the site-specific decommissioning activities have already

been addressed in previous environmental analyses. Ninety days after submitting the PSDAR, the licensee may begin major decommissioning activities.

After receiving the PSDAR, the NRC will publish a notice of receipt in the Federal Register, make the report available for public review and comment, and hold a public meeting in the vicinity of the plant to discuss the licensee's intentions. At this meeting, members of the public are invited to communicate their needs, concerns, and interests in the decision making process during decommissioning. The regulations regarding the PSDAR are found under Part 50.82 of Title 10 of the *Code of Federal Regulations*.

Release of Part of a Power Reactor Facility or Site for Unrestricted Use

10 CFR 50.83 describes the regulations regarding partial release of a nuclear plant site for unrestricted use. If a licensee chooses to pursue this, prior written NRC approval is required to release part of a facility for unrestricted use at any time before receiving approval of a license termination plan.

License Transfer During Decommissioning and Public Involvement

The NRC maintains regulatory authority and oversight of the licensee (currently, Entergy) both during operation and throughout decommissioning. Should Entergy pursue transferring the license to another company to perform decommissioning, that transfer would require NRC review and approval. Any new licensee, if approved, would be subject to all NRC requirements and regulations.

NRC Office Instruction No.: LIC-107, "Procedures for Handling License Transfers," describes the processing by the Office of Nuclear Reactor Regulation of license transfer applications, including orders and associated conforming amendments (ADAMS Accession Number ML17031A006).

Failure to Adequately and Promptly Evaluate, Identify, and Correct Degradation of Offsite Power Feeder 13W93, FIN 05000247/2019001-01 (ML19134A080)

The non-cited violation for the loss of the 13.8 KV feeder line, 13W93, was appropriately determined to be of very low risk significance because of the high redundancy of electrical power supplies at Indian Point. Indian Point Unit 2 is normally supplied with electrical power from the main generator. Should the main generator fail, there are four credited external offsite power lines (required by technical specifications), any one of which can supply adequate power to Unit 2 (in the event of a loss of the main generator) to safely shutdown Unit 2. Since only one was out of service, the other three remained available to provide power. In addition to these four credited offsite power lines, there are two additional onsite power lines that can transfer power between the two units. There are also three emergency diesel generators that will automatically start and load if a total loss of all offsite power occurs. A fourth Unit 2 emergency diesel generator serves as an additional backup power source. Finally, the Unit 3 Appendix R diesel can also be cross-tied to provide power to Unit 2 in the event of a loss of all electrical power in Unit 2. The high redundancy of offsite power lines and diesel generators (four credited lines, two available tie lines, and five diesel generators) ensures, with very high reliability, that Indian Point could be safely shutdown in the event of a loss of the main generator with the failure of a single offsite power line, 13W93.

The risk significance of a finding is a combination of the likelihood of a failure causing an accident (loss of power) multiplied by the potential consequences of that failure (leading to core damage). In this case, the likelihood of losing all electrical power to safely shutdown the plant is very, very low. The risk significance of this finding was appropriately assessed as Green in the

Reactor Oversight Process because the risk of a serious accident resulting in core damage was very, very low (less than one in one million).

Performance Indicators, NRC Findings and Violations Documented at Indian Point
Publically available inspection reports, performance indicators, and NRC documented findings are available at the NRC's public webpage:
https://www.nrc.gov/reactors/operating/oversight.html

High Burn-up Fuel
"Burn-up" is a way to measure the uranium burned in the reactor, and is expressed in gigawatt-days per metric ton of uranium (GWd/MTU). Anything above 45 GWd/MTU is considered high burn-up fuel. High burn-up fuel allows utilities to get more power out of their fuel before replacing it.

Due to security concerns, the NRC does not confirm whether or not a licensee currently uses or has used high burn-up fuel. The NRC has conducted extensive efforts to review the safety of high burn-up fuel. The staff performed an evaluation of data collected and confirmed that the use of fuel up to the existing limits did not pose safety problems. The NRC published Generic Safety Issue 170, "Fuel Damage for High Burn-up Fuel," and documented its resolution in NUREG-0933 (Main Report with Supplements 1-34). These documents are publicly available on the NRC's website. There is also a public backgrounder document available to summarize these documents at www.nrc.gov/reading-rm/doc-collections/fact-sheets/bg-high-burnup-spent-fuel.html.

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NRC's 2018 ANNUAL ASSESSMENT OF INDIAN POINT

Brett Klukan, Regional Counsel
Region I Office of the Regional Administrator

1

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NRC's 2018 ANNUAL ASSESSMENT OF INDIAN POINT

WELCOME

Ray Lorson, Deputy Regional Administrator

2

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Indian Point 2 & 3 Safety Performance in 2018

2018 Reactor Oversight Process
Nuclear Regulatory Commission – Region I
Brian Haagensen, Senior Resident Inspector

3

Resident Inspection Office Staff

Brian Haagensen
Senior Resident Inspector

Diane Hochmuth,
Administrative Assistant

Andrew Siwy
Unit 2 Resident Inspector

Justin Vazquez
Unit 3 Resident Inspector

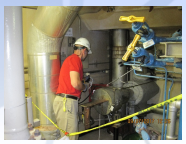
4

Protecting People and the Environment

NRC Independent Safety Inspections

Reactor Oversight Process

- NRC inspectors have unfettered access to all plant activities related to nuclear safety and security
- Full-time NRC resident inspectors
- NRC regional specialists conduct additional inspections at each nuclear plant



5

Protecting People and the Environment

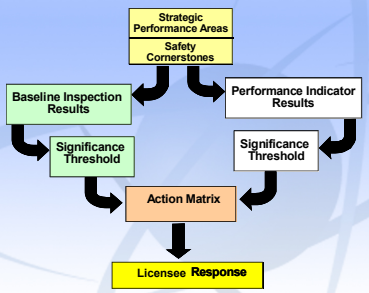
2018 Inspection Activities

- 8638 hours of inspection and related activities:
  - Examples of Resident Inspections
    - Maintenance Effectiveness
    - Surveillance Tests
    - Adverse Weather Preparation
  - 2018 Team Inspections
    - Access Authorization & Control, Safeguards Information Control, &
    - Operator Licensing Exams
    - Emergency Preparedness Exercise
    - Design Bases Assurance
    - Security Force-On-Force

6

Protecting People and the Environment

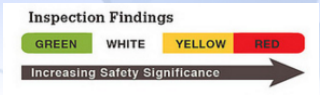
Reactor Oversight Process



Performance Indicators & Findings

January 1 through December 31, 2018

- 11 Green findings of very low safety significance
- Performance Indicators:
  - U2: All Green
  - U3: All Green



NRC Assessment Summary

- Entergy operated Indian Point 2 & 3 safely
- Indian Point 2 remained in the Licensee Response column of the Action Matrix
- Indian Point 3 remained in the Licensee Response column of the Action Matrix
- Baseline inspections implemented for each unit in 2019

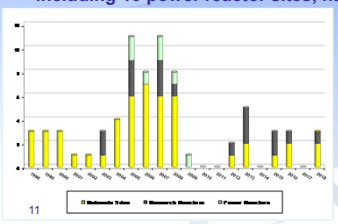
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Decommissioning

Bruce Watson,
Chief, Reactor Decommissioning Branch

Decommissioning Experience

- Decommissioning regulations are performance-based and risk-informed
- Extensive decommissioning experience
- All sites that have completed decommissioning, including 10 power reactor sites, have been released for unrestricted use



Reactor Decommissioning Options

- **DECON or Active Decommissioning:** Active dismantling of the plant
- **SAFSTOR:** Plant placed in a safe, stable condition (e.g., Indian Point 1)
- Radiological decommissioning must be completed within 60 years

Reactor Decommissioning Program

Maine Yankee

- 22 Power Reactors Currently Undergoing Decommissioning:
  - 10 in Active Decommissioning*
  - 12 in SAFSTOR
- 11 Announced Shutdowns

* License termination is expected at Humboldt Bay, La Crosse, and Zion Units 1 & 2 by 2020

QUESTIONS

Ray Lorson, Deputy Regional Administrator