# NUCLEAR ENERGY ADVISORY COUNCIL
# October 5, 2023 at 7:00 PM
# Waterford Town Hall

**MINUTES**

**Members Present**
Rep Kevin Ryan, Chair
Alternate Chair Mr. Jeffrey Semancik representing DEEP Commissioner Dykes
Mr. Craig Salonia Mr. R. Woolrich
Mr. Bill Sheehan Dr. James Sherrard
Mr. J. McGunnigle

Members not present:
Mr. A. Jordan Sen Cathy Osten

1. **Call to Order of Meeting**
   Council Chair Rep. Ryan called the meeting to order at 7:00 PM.

2. **Approval of Minutes of previous Council meetings.**
   a. A motion was made to approve the minutes of the March 16, 2023 Council meeting by Mr. Sheehan and seconded by Mr. Sherrard. The minutes were approved without objection.
   b. A motion was made to approve the minutes of the September 16, 2023 Council meeting by Mr. Salonia and seconded by Mr. Woolrich. The minutes were approved without objection. Mr. Sheehan abstained.

3. **Program - Presentation by Dominion Nuclear Energy Inc. Ms. Lori Armstrong, Director of Nuclear Safety and Licensing (DNSL) and Mr. Guy Blackburn, Plant Manager, and Ms. Susan Adams, State Policy Director for New England** (presentation attached).
   a. Safety - Mr. Blackburn highlighted industrial safety performance at Millstone. He noted that there have been two Occupational Safety and Health Administration (OSHA) recordable accidents at the station year to date. Both were "line- of fire" type accidents resulting in fractured fingers. He also noted the commitment of Dominion to safety including Millstone's recertification as Voluntary Protection Program (VPP) Star site by OSHA. Mr. Woolrich asked to explain what VPP is. Mr. Balckburn noted it is a voluntary non-nuclear safety program based on employee participation and leadership in industrial safety. Ms. Armstrong added that OSHA sends a team to evaluate program performance. This evaluation involved five people on site for five days. The team has safety experts from other non-nuclear facilities and provides an opportunity to learn from other industries.
   b. Millstone Unit status - Mr. Blackburn discussed the two-year power history curves for both Millstone Units 2 and 3.:
      i. Currently both Units 2 and 3 are at 100% power.
      ii. Millstone Unit 2's conducted a planned outage in 2023. It was expected to be approximately 30 days for refueling and maintenance but lasted 86 days. The major reason for unplanned outage extension was related to two safety related service water piping issues. First was degradation of sections of piping in the

turbine building identified during the outage. The second was a through wall leak in a section of 24-inch service water pipes that was identified while addressing the degradation. This pipe is ductile iron with cement casting and additional polymer lining. Dominion determined that the leak resulted because the polymer lining in the vicinity of leak was six times thinner than other locations. All sections of piping affected were re-coated or replaced. Repairs to piping took a long time due to difficulty of access and the need to make repairs compliant with American Society of Mechanical Engineers (ASME) codes. During the outage, Dominion laso implemented a design change to check valve 2-MS-4B, Steam Supply Check Valve to the Turbine Driven Auxiliary Feedwater (TDAFW) Pump in order to resolve a historical issue of chatter. Upon startup, Dominion determined the design change did not solve the issue. Unit 2 operated at reduced power until they changed the valve to a different type of check valve which resolved the issue.

1. Mr. Sheehan asked if it was a swing check valve. Mr. Balckburn said the old design was a swing check valve that is normally closed and opened by steam flow. Dominion changed the design to a check valve that is normally open and closes if steam flows the wrong direction.
2. Mr. Woolrich noted that there are two check valves to the TDAFW pump and asked if Dominion replaced both valves. Mr. Blackburn stated they only replaced one check valve and that the piping configuration around the other check valve did not cause the same problems with chattering.
3. Mr. Woolrich asked if the chattering was audible in the plant. Mr. Blackburn stated it is in an accessible portion of the plant at power and is clearly audible when the check valve is chattering. However, Dominion also plans to open and inspect the new valves after several months to ensure it is working.
4. Mr. Salonia asked if Dominion investigated anything else besides the valve. Mr. Blackburn stated that their investigation determined the piping arrangement and orientation including multiple bends made the style of check valve installed susceptible to chatter and ultimately failure.
5. Mr. Salonia asked if they understood why the service water pipe coating was thinner in one area. Ms. Armstrong noted that they found the thinner area. One hypothesis is that the crawler they use to send personnel into pipes for inspection may be rolling over that area causing it to thin.
6. Mr. Semancik asked if Dominion evaluated the Quality Control (QC) requirements in their safety related pipe lining installation procedures. Ms. Armstrong noted the liner is inserted and then expanded by flowing hot water through the pipe. The procedures measure the thickness at the ends where it can be measured without disturbing the coating. Mr. Blackburn added that rather than re-lining the pipes, Dominion is exploring replacing the piping with an improved piping made from a corrosion resistant alloy (AL6XN).
7. Mr. Woolrich noted that it seems the number of reports of leaks from low pressure piping and it seems to be getting old. Since Millstone 2 seems to be about the mid-range of units in the Dominio fleet, he asked if Dominion searched the fleet to see if they are having similar issues. Mr. Balckburn said that they did look at fleet operating experience. He also noted that a

good example was flow accelerated corrosion (FAC) that has contributed to low pressure feedwater heater leaks at both units. Millstone is using fleet experience to help resolve these issues.

8. Mr. Semancik noted that the Licensee Event Report (LER) on the service water leak noted that Nuclear Regulatory Commission (NRC) inspectors identified the service water issues before plant engineers and staff. He asked if they have any insights on this. Mr. Blackburn noted that NRC inspectors are in the plant on a regular basis and could be expected to find some issues. He noted there are a lot of leaks the plant staff identifies and fixes. This was in an area Millstone had considered inaccessible and are addressing such areas in their program going forward. Ms. Armstrong stated Dominion is improving its Aging Management assessment process for sea water leaks. They have a group dedicated to improving preservation of components.
9. Mr. Sheehan noted part of the life extension approval was establishing a program that slowly rebuilt much of the plant over the years which is being done.

iii. Unit 3 experienced an automatic reactor trip in May 2023 that resulted in a 30 day forced outage. The trip was caused by moisture in the B phase of the main generator output breaker (MGOB) that caused an electrical ground fault.

1. Mr. Woolrich asked how that occurred. Mr. Blackburn stated that one of the air compressors (air is used to quench electrical arc when breaker is opened under load) was determined to be cycling more than it should be. This resulted in moisture not clearing due to extended run time.
2. Mr. McGunnigle asked if the air system had a dryer. Mr. Blackburn stated it did not and that the system was not manually drained enough to clear the moisture. Operators had noted the compressor was running more often and they had planned maintenance to replace the compressor.

c. Nuclear Regulatory Commission (NRC) Findings – Ms. Armstrong briefed the Council that Millstone remains in the licensee response column of the NRC oversight matrix (best performance column). IN 2023 YTD, the NRC has identified thirteen Green (very low safety significance) Non-cited Violations (NCVs). All findings are in the Dominion corrective action system.

i. Ms. Armstrong noted one violation noted that one violation was related to a calculation for a maximum probable hurricane. Specifically, the NRC inspector noted that one calculation did not allow for time to water to drain down after flooding in order to allow access to an area.

ii. Mr. Semancik asked how many of the violations were identified by the NRC. Ms. Armstrong stated nine of the thirteen violations were NRC identified and that represents a number higher than they would like. The same is true for other Dominion units and the fleet is working together to improve.

iii. Mr. Woolrich noted that two or three years ago Dominion presented on downsizing and the Council asked about losing talent. Was Dominion past that now? Ms. Armstrong noted it was hard to normalize to NRC inspection and they try to review items ahead of time. However, some inspections ony occur every 3 years. She noted they recently had a huge cyber security inspection with no

findings and that was better than most in industry. Mr. Balckburn stated staffing remains high with an emphasis on operator staffing. They are not seeing a high level of departure and get a good pool of applicants including from Navy, maritime industry and engineering schools.

iv. Mr. Semancik asked if Dominion might be seeing engineering challenges due to the age of technology at Millstone which may not be taught in engineering programs anymore. Mr. Blackburn noted this was a challenge in instrumentation and controls and many new designs are now digital. Ms. Armstrong noted they have engineering work group specific training to address gaps. She also noted in some cases they have trained personnel and built programs to support equipment not supported by vendors. For example, Millstone has its own circuit card repair facility and circuit breaker overhaul shops.

d. Ms. Armstrong reviewed recent license amendments. All NRC correspondence related to license amendments is reviewed by the Council as noted in section 4 of the minutes.
   i. The most significant license amendment was approval of a power uprate of Millstone Unit 3 based upon margin uncertainty recovery (MUR). The license change allowed Millstone Unit 3 to increase output power approximately 1.6% (18 Mwe).
   ii. Additional License changes were approved to align some license conditions with industry initiatives and to allow Dominion to make some technical changes within licensee controlled programs with appropriate analyses.

e. All NRC performance indicators (PIs) for Millstone are Green.

f. Emergency Preparedness and Response update was provided by Ms. Armstrong. Millstone made no emergency declarations since presentation to the Council in 2022. Ms. Armstrong discussed two minor items related to the offsite emergency plan:
   i. New Emergency Action Level tables were implemented a few years ago to ensure event classification was more consistent with industry standards.
      1. Mr. Woolrich asked if Dominion had stopped testing offsite sirens every Saturday. Mr. Sheehan responded that each town is responsible for the testing frequency of their sirens not Dominion.
   ii. Dominion recently completed its required 10-year evacuation time estimates (ETE) study.
      1. Mr. Sheehan noted that, in his opinion, sheltering in place would be preferred to evacuation of the 10-mile Emergency Planning Zone due to the roadway infrastructure in the area. Ms. Armstrong noted that the next step is for the state and Dominion to use the ETE to ensure that procedures use the right method for public protective actions.

g. Ms. Armstrong stated there were no Environmental Impact events. Ms. Armstrong presented the status of airborne radioactive releases from the station. All releases were below planned quantities and well below any federal limits.

h. Mr. Blackburn discussed performance of reactor Coolant Pump (RCP) seals as requested by the Council.

i. Dominion has experienced issues with RCP seal performance at Unit 3. The seal packages are a newer design from FlowServe and were supposed to last for 14 to 15 years. Millstone 3 seals have only been lasting 18 to 34 months. Turkey Point Nuclear Plant (FL) is also experiencing similar issues. Dominion continues to work with the vendor to improve the design of the RCP seals. Dominion will replace two of the four RCP seals in unit 3 during this fall's refueling and maintenance outage.
ii. Mr. Semancik noted that Dominion also had to replace several RCP seals at Unit 2 during the extended outage this spring and asked if they were having seal issues at Unit 2. Mr. Blackburn indicated that these resulted from a different issue related to operation of the seals during startup not a design issue.
iii. Mr. Salonia asked how Dominion monitors performance of the seals. Specifically, if they don't fail do they do anything else? Mr. Blackburn answered that they are also bringing the vendor on site to periodically disassemble and inspect the RCP seals to look for any indications.
iv. Mr. Sheehan asked what the average radiation dose is for replacing an RCP seal. Mr. Balckburn stated it was typically 0.350 person-rem. He noted that these are large (250 to 350 lbs) seals that take about four shifts to replace.
v. Mr. Salonia noted that Dominion seems to moving in the right direction and asked if they are changing the RCP seals every outage. Mr. Blackburn stated they are seeing improved performance and longer run times. He noted that in addition to replacing some seals, they have several on line monitoring points and setpoints to identify degradation including vibration monitoring.
vi. Mr. Woolrich asked if they have a long term strategy for older equipment. Mr. Balckburn stated that they have plans to replace some older equipment and are moving in that direction. He noted they have to train to the newer equipment. He replacement of the Radiation Monitors as an example where they are systematically replacing all of the radiation monitors
vii. Mr. Woolrich asked how many people are employed at the station and what the turnover rate is. Mr. Blackburn stated 685 full time Dominion employees report the station Vice President, but here are also other Dominion staff that report to corporate leadership and long term contractors. He estimated about 100 personnel including these others. He stated turnover is about 20 to 40 personnel per year.
viii. Mr. McGunnigle asked if Millstone was experiencing vendor quality and parts issues. Mr. Blackburn stated it was a challenge as it is for others. They have seen a loss of manufacturing talent. As a result, they have pivoted and are now considering this in their strategy. For example, they have been seeing 72 month lead times for parts and, as a result, now are buying extra spare parts with long lead times. They have also gone to other retired units such as Pilgrim and the unfinished unit at Seabrook to scavenge parts.

i. Ms. Adams provided an update on nuclear policy issues.
   i. Ms. Adams noted increased bipartisan support for nuclear energy in the state. Both Gov Lamont and DEEP Commissioner Dykes have visited the site and discussed new nuclear and Small Modular Reactors (SMRs)
   ii. Senate Bill 7 (Public 23-102) created a Connecticut Council for Advancing Nuclear Energy Development, different from the Nuclear Energy Advisory Council, to bring

together nuclear people in the state to discuss the future of nuclear. In section 35, the act directs a DEEP study to evaluate deploying new nuclear in the state and directs DEEP to work with the Council on this. The Act also makes nuclear a class 1 renewable (only second state to do this).

iii. The current Power Purchase Agreement (PPA) for Millstone power runs through 2029. It is a priority for Dominion in 2024 to manage PPA going forward.
   1. Mr. Woolrich asked what the PPA is for. Ms. Adams stated it is an agreement to buy an amount of power at a given price. Dominion is looking for an accelerator vice a fixed price to account for inflation. The legislature is reluctant due to fluctuating costs.

iv. Dominion is also negotiating with a data center operator to lease property on Millstone and buy energy directly (behind the meter) from Dominion. There is no lease or PPA yet. It expected the data center with use 300 to 400 MWe.
   1. Mr. Sheehan noted the town of Waterford has a Memorandum of Understanding with the data center developer. He also noted there is a concern for low frequency noise.

v. Mr. Semancik asked if Dominion had any vulnerability to Russian uranium for its fuel. Mr. Balckburn answered that Dominion has secured most of its fuel supply and has it in accessible countries. They do not see any threats.

vi. Mr. Blackburn discussed Dominion interest in new nuclear and SMRs. He noted that Dominion is looking at deploying SMRs in the 2030 to 2035 including a consortium with utilities in Romania, Poland, and Czech Republic. Right now they are just looking and monitoring with no specific deployment plans.
   1. Mr. Woolrich asked if they are looking to replace units 1, 2 or 3. Mr. Blackburn stated it was still too far off to determine that. Right now, Dominion is exploring viable options in VA. SC, or CT. Most likely Dominion will identify one location and then move forward.

vii. Mr. Blackburn also discussed supplemental license renewal efforts for Millstone. He stated Dominion was exploring license extension at all their sites. North Ann Power Station (VA), Surry Power Station (VA), and VC Summer Site (SC) are all going through the process. Dominion is reviewing economic viability of Millstone and will look at license extension based on that.
   1. Mr. Salonia noted that at some future meeting he would like to hear about what we have learned in the last 50 years about such things as earthquake effects on buildings and how that is applied to license renewal reviews.

**4. NRC Correspondence Reviewed since past meeting.**

The following list of NRC Correspondence was reviewed.

a. Millstone Power Station, Unit No. 3 – Review of The Spring 2022 Steam Generator Tube Inspection Report (EPID L-2022-LRO-0142) dated June 12, 2023.
   i. Dominion Energy Nuclear Connecticut, Inc. Millstone Power Station Unit 3, End of Cycle 21 Steam Generator Tube Inspection Report dated October 27, 2022.
   ii. Dominion Energy Nuclear Connecticut, Inc. Millstone Power Station Unit 3 End of Cycle 21 Steam Genera Tor Tube Supplement dated March 8, 2023.

iii. Dominion Energy Nuclear Connecticut, Inc. Millstone Power Station Unit 3 Response to Request For Additional Information For Spring 2022 Steam Generator Tube Inspection Report (EPID L-2022-LRO-0142) dated April 20, 2023.

b. NRC email from Mr. Joseph Nick (NRC) to Mr. Jeffrey Semancik (CT DEEP) re: NEAC Question on Steam Generator Plugging Limit dated July 5, 2023.
c. Millstone Power Station, Unit No. 3 – Authorization and Safety Evaluation for Alternative Request No. IR-4-11 (EPID L-2022-LLR-0067) dated July 21, 2023.
d. Millstone Power Station, Units 2 And 3 - Closeout of Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors" (EPID L-2017-LRC-0000) dated July 26, 2023.
e. Millstone Power Station, Units 2 and 3 – Integrated Inspection Report 05000336/2023002 AND 05000423/2023002 dated August 9, 2023.
f. Request for Withholding Information from Public Disclosure – Millstone Power Station Unit 3 License Amendment Request to Revise Technical Specifications for Reactor Core Safety Limits, Fuel Assemblies, and Core Operating Limits Report Related to Framatome GAIA Fuel (EPID L-2023-LLA-0074) dated August 18, 2023.
g. Request for Withholding Information from Public Disclosure – Millstone Power Station Unit 3 License Amendment Request to Use Framatome Small Break and Realistic Large Break Loss of Coolant Accident Evaluation Methodologies for Establishing Core Operating Limits and Exemption Request for Use of M5 Cladding (EPIDS L-2023-LLA-0065 AND L-2023-LLE-0013) dated August 18, 2023.

5. **Other material reviewed**

NEAC reviewed the following information:

a. "The changing face of nuclear power: New tech could lead to an energy renaissance," CTInsider, dated February 22, 2023.
b. Connecticut Public Act No. 23-102, An Act Strengthening Protections for Connecticut's Consumers of Energy.
c. Dominion Energy Nuclear Connecticut, Inc. Millstone Power Station Unit 2 Licensee Event Report 2023-002-00, "Failed Check Valve Resulted in an Unanalyzed Condition," dated April 21, 2023.
d. Dominion Energy Nuclear Connecticut, Inc. Millstone Power Station Unit 2 Licensee Event Report 2023-001-00, "Structural Integrity Of "A" Train Service Water Header Piping Could Not be Demonstrated Causing the Unit to Operate in a Condition Prohibited by Technical Specifications," dated July 7, 2023.
e. Dominion Energy Nuclear Connecticut, Inc. Millstone Power Station Unit 3 Licensee Event Report 2023-001-00, "Automatic Reactor Trip Due to Main Generator Output Breaker Ground Fault," dated July 27, 2023.

**6. Public Comment**

a. Four members of the public were in attendance.

b. There were no questions from the public.

7. **Council Business**
   a. Next Council meeting will be December 14, 2023 at Waterford Town Hall for discussion and drafting of the annual report.

8. **Adjournment**
   Motion was made by Mr. Sheehan and seconded by Mr. McGunnigle to adjourn; no objections; unanimous vote in favor; meeting adjourned at 8:27 PM.

# Nuclear Energy Advisory Council Meeting

## Millstone Presentation | October 5, 2023

Millstone Power Station – Dominion Energy
Waterford, CT

# Safety

- Safety is our first priority
- Commitment to protect the health and safety of the public
- MPS is an OSHA VPP Star site

# Millstone Current Status

## Millstone Unit 2

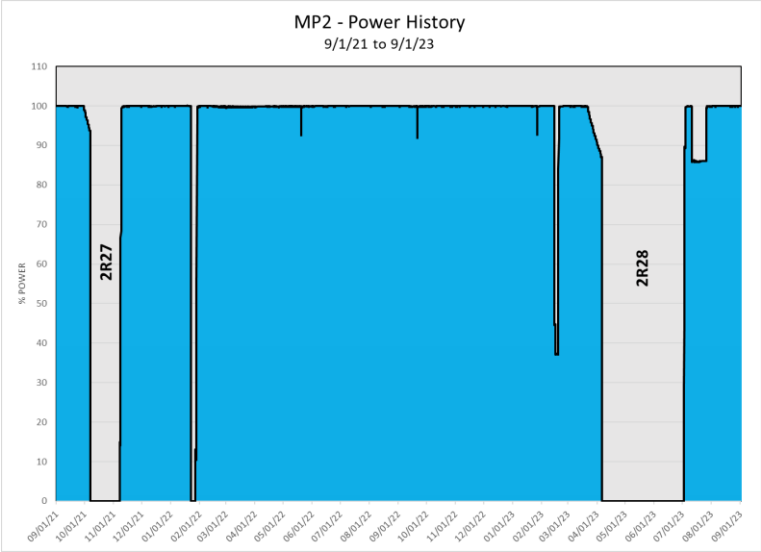
- 80 days online
- 61.11% capacity factor YTD

## Millstone Unit 3

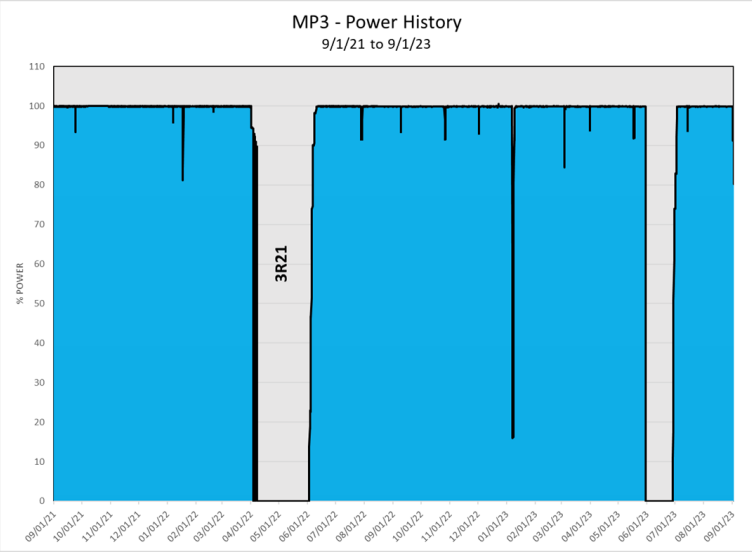
- 83 days online
- 86.37% capacity factor YTD

# Operations Power History

## Unit 2



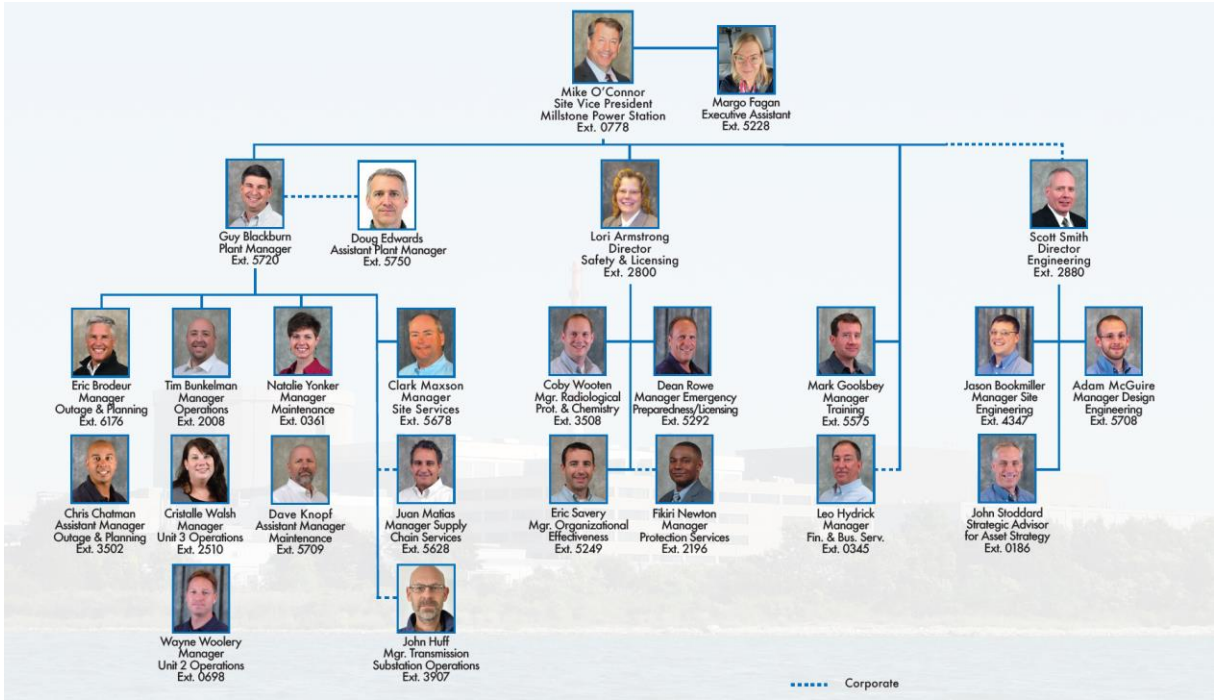

## Unit 3






Dominion Energy

# MPS Leadership Team




- Staffing levels
- Operations Pipeline



Dominion Energy

# NRC Findings

- **Station is in the licensee response column**
- **13 GREEN non-cited violations/findings identified since last meeting**
  - All are very low risk significance
  - All are in our corrective action system

# License Amendment Requests

**Significant License Amendment Requests Approved by the NRC**

- No significant license Amendments approved in 2023
- Two generic industry LARs were approved

# Millstone NRC Performance Indicators


**Unit 2 Second Quarter 2023 NRC Performance Indicators**


**Unit 3 Second Quarter 2023 NRC Performance Indicators**



Dominion Energy

# Millstone Nuclear Oversight Summary

- Performance

# Environmental Impacts

- No Reportable Events

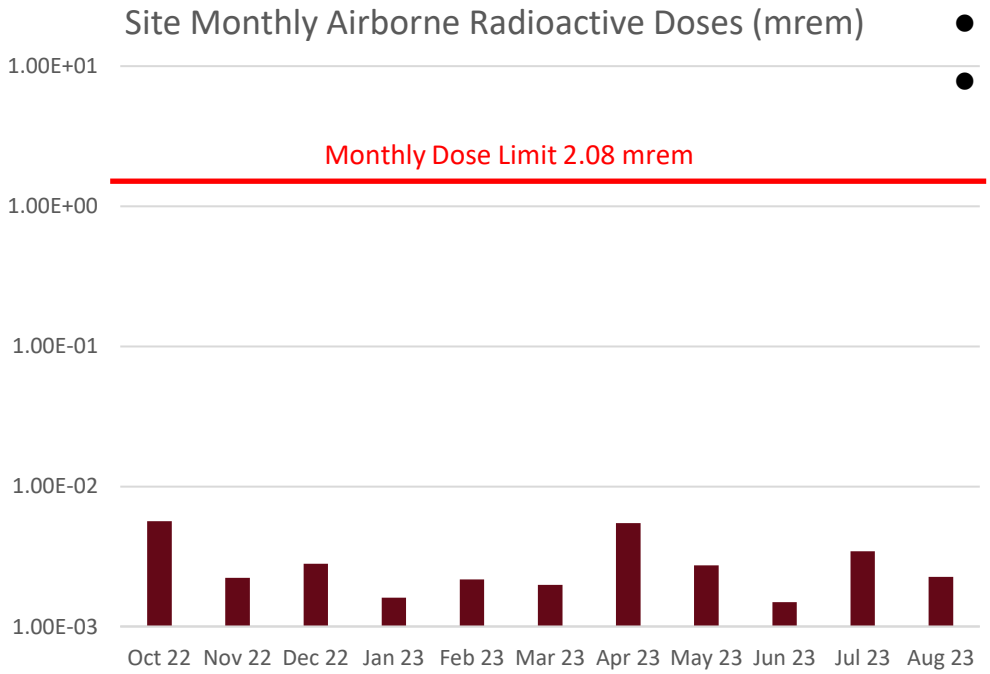
# Emergency Plan Event Declarations

- No Emergency Plan Event Declarations in 2023

# Millstone Evacuation Time Estimate (ETE)

- 10 Year Census ETE for Millstone completed by KLD Associates
- KLD Associates also completed a review for Millstone against NEI Guidance for Rapidly Progressing Severe Events
- Millstone is Currently Working with CT DEMS/DEEP to review ETE and KLD Review results to determine if changes to PARs/PADs are needed
  - Target is to have any needed changes identified and implemented by end of February 2024
- Identified PAR/PAD changes need to be implemented by next NRC/FEMA Exercise for evaluation (June 2024)

# Airborne Effluent Releases




- Releases continue to be below projections
- Data publicly available on our website

Millstone Gaseous Radioactive Doses –August

| Dose category[1] | Unit[2] | Limit[3] | Actual | % of limit |
|---|---|---|---|---|
| Noble gas gamma | mrad | 0.833 | 0.0000099 | less than 0.0012 |
| Noble gas beta | mrad | 1.67 | 0.000024 | less than 0.0015 |
| Iodine, particulates, tritium | mrem | 1.25 | 0.0029 | less than 0.230 |
| Total, whole body | mrem | 2.08 | 0.0023 | less than 0.109 |



Dominion Energy

# Improvements & Increased Safety and Reliability

## Unit 2 Improvements

2R28 Completed Scope:

- RPS Upgrades
- Switchyard Panel Replacement
- Replaced Condensate PM/Heater Drain PM/B-RCP Motor
- LP Turbine Major Inspection

# Improvements & Increased Safety and Reliability

## Unit 3 Improvements

3R22 Planned Scope:

- 4C FWH Replacement
- Fire Detection Upgrades
- SG Inspections
- RCP Seal Replacements
- RCP Motor replacement
- C LP Turbine Major Overhaul

# Impact of Recent Legislation

**Public Act 23-102 (Senate Bill 7) -** *AN ACT STRENGTHENING PROTECTIONS FOR CONNECTICUT'S CONSUMERS OF ENERGY*

- Section 33 creates the CT Council for Advancing Nuclear Development
  - This was proposed by Sen. Osten and supported by Dominion Energy. The council's purpose is to plan for the advancement of nuclear energy in the State. Mike O'Connor has been appointed to serve.

- Section 35 requires DEEP to conduct a study to:
  - *(1) evaluate the feasibility of deploying small modular reactors, advanced nuclear reactors, fusion energy facilities and other zero carbon resources that can improve affordability, fuel security, renewable integration, and winter reliability within the New England regional electric grid;*
  - *(2) review the process for power purchase agreements procured pursuant to a state solicitation or pursuant to the state's renewable energy programs and identify best practices to ensure reliability in associated energy markets, reasonably reduce costs to ratepayers and promote conservation*
  - As part of the study, DEEP shall consult with the Nuclear Energy Advisory Council.
  - Not later than January 15, 2024, DEEP shall submit a progress report and the full report is due March 15, 2024, to the Energy and Technology Committee.

- Section 36 expands Class 1 renewables to include new nuclear facilities (after 10/1/2023)
  - Dominion worked against an amendment that would have removed this section from the bill.



https://www.cga.ct.gov/2023/act/pa/pdf/2023PA-00102-R00SB-00007-PA.pdf

# Impact of Recent Legislation, *continued*

## House Bill 6851 – Public Act 23-156

- This bill requires DEEP to develop and approve a hydrogen strategic plan to grow the state's hydrogen economy. It requires DEEP to seek federal funding opportunities for projects that advance hydrogen in the state

## Senate Bill 1170

- This bill was created as a placeholder for a power purchase agreement extension. Talks were suspended during the session and the bill failed to move forward. This will be a priority for the upcoming session.



https://www.cga.ct.gov/2023/act/Pa/pdf/2023PA-00156-R00HB-06851-PA.PDF

# Other Requested Topics

- **New Nuclear**
- **Life Extension**



Dominion Energy

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