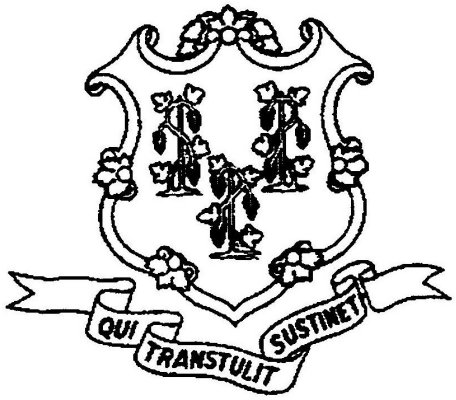
STATE OF CONNECTICUT



THE
NUCLEAR ENERGY ADVISORY COUNCIL
REPORT

2021

Established Pursuant to Public Act 96-245

Rep. Kevin Ryan, Chairperson

Nuclear Energy Advisory Council
2021 Report

Contents

Charge to the Council

While recognizing the regulatory authority of the U. S. Nuclear Regulatory Commission (NRC) over commercial nuclear power facilities, the State of Connecticut maintains a very serious interest in matters that could affect the health and safety of the public and the natural resources of the state. As such, section 17 of Public Act 96-245 (now CGS16-11a, as amended) authorizes the creation of a Nuclear Energy Advisory Council (the Council) and requires the Council to:

1. Hold regular public meetings to discuss issues relating to the safety and operations of nuclear power plants and to advise the governor, legislature, and municipalities within a five-mile radius of the plants on these issues;

2. Work with federal, state, and local agencies and the companies operating such plants to ensure public health and safety;

3. Discuss proposed changes in, or problems arising from, the operation of the plants;

4. Communicate, through reports and presentations, with the plants' operators about safety or operational concerns at the plants, and

5. Review the current status of the plants with the Nuclear Regulatory Commission.

Council Members

The Council consists of fourteen (14) members appointed by the Governor, legislative leadership, and the executive bodies in the towns in or near which the state's nuclear power plants are located. Two new members were appointed to the Council in 2021. There were nine active members at the end of 2021. One member is on sabbatical and informed the Council of his intent to return in 2022. Four vacancies remain. The Council urges the appointing authorities to work with the Council Chair to appoint new members. (Appendix 1).

Executive Summary

This is the twenty-seventh annual report presented by the Nuclear Energy Advisory Council (the Council). During calendar year 2021, the NEAC met four times and received reports from representatives of the U. S. Nuclear Regulatory Commission (NRC) and Dominion Energy Nuclear Connecticut as well as a written status report from Connecticut Yankee Independent Spent Fuel Storage Installation (ISFSI). The Council received and reviewed Routine and Special NRC inspection reports on the safety and operation of Millstone Power Station (MPS) as well as other documents related to MPS and NRC activities. These documents are publicly[1] available and listed in the meeting minutes (Appendix 2).

The Council continues to examine issues relating to the safety and operations of nuclear power plants and advise the governor, legislature, municipalities, and residents within a five-mile radius of the plants on these issues.

The Council concurs with the NRC that during 2021, Dominion safely operated the nuclear plants at Millstone Power Station. Spent nuclear fuel continues to be safely stored and monitored in wet and dry storage at Millstone Power Station and at the ISFSI at Connecticut Yankee. NRC and DEEP provide effective oversite of activities. Millstone continues to safely operate providing carbon free energy to the citizens of Connecticut.

Council Recommended Actions

State:

- Facilitate and encourage the Division of Emergency Management and Homeland Security (DEMHS)/DEEP nuclear emergency preparedness collaboration and continue executing current responsibilities and duties in kind.
- The Governor/General Assembly/DEEP should endorse a nuclear waste strategy that includes consent based consolidated interim storage.
- DEEP should coordinate review and comment on NRC's proposed decommissioning rule to ensure the interests of the state are represented.
- Elected officials responsible for appointing Council members should work with the Council Chair to identify and appoint new members to fill existing vacancies.

The Council:

- The Council will continue to discharge its duties as specified by Section 17 of Public Act 96-245 (now CGS16-11a as amended).
- The Council has identified and will monitor the following trends to ensure safe operations of Millstone Power Station
    - Elevated number of operational events
    - Impact of staffing changes and loss of organizational knowledge
    - Elevated number of vendor quality and performance issues.
- The Council believes that Dominion Energy continues to respond appropriately to the COVID-19 Public Health Emergency (PHE) to protect critical workers required to safely operate the plants, provide security, and respond to emergencies.

[1] https://portal.ct.gov/DEEP/Radiation/Nuclear-Topics

Highlighted Findings

Millstone Operations

Based upon presentations of Millstone Power Station (Millstone) in Waterford, CT performance made to the Nuclear Energy Advisory Council (the Council) by the U.S. Nuclear Regulatory Commission (NRC) and Dominion Nuclear Energy, Inc. (Dominion) in conjunction with the Council's review of NRC and Dominion correspondence and reports, the Council:

- Did not identify any safety or operational concerns with the plants.
- Concludes the NRC continues to provide effective regulatory oversight
- Identified the following trends in performance
    - Elevated number of operational events
    - Impact of staffing changes and potential for loss of organizational knowledge
    - Elevated number of vendor quality and performance issues

NRC Assessment of Performance

The NRC briefed the Council on its annual assessment of performance at Millstone. This assessment was informed by the observations, reports, and inspections conducted by NRC Resident Inspectors and supplemented with regional and headquarters inspectors in areas such as security, cybersecurity, health physics and engineering design basis. The NRC concluded that Dominion Nuclear Energy continues to operate Millstone Power Station safely, protect public health and safety, and protect the environment. Millstone Units 2 and 3 both remain in the Licensee Response column of the Regulatory Response Matrix (the highest level of performance) and will therefore remain under baseline inspection. Since the last Council report:

- Operations at Millstone Unit 2 included one unplanned power reduction
- Operations at Millstone Unit 3 included two unplanned manual shutdowns, two unplanned transients, and one unplanned power reduction
- No station emergency events were declared in 2021
- The NRC identified eight inspection findings - all were determined to be of very low safety significance (Green).

Operational Events

Dominion briefed the Council on its internal assessment of performance including two unplanned shutdowns:

- December 30, 2020 Millstone Unit No. 3 power reduction and subsequent manual shutdown in order to facilitate repairs to a non-safety related feedwater heater
- June 10, 2021 Millstone Unit No. 3 manual reactor shutdown to perform pre-emptive equipment maintenance (seal replacement) on one of the four reactor coolant pumps. Operators and engineers had been monitoring performance and determined it was prudent to conduct a planned mid-cycle shutdown to ensure sustained equipment and plant reliability during the peak summer season

The Council was briefed on several unplanned transients/power reductions:

- April 1, 2021 Millstone Unit 3 automatic reactor shutdown due a ground fault on the main electrical generator output

- January 29, 2021 and February 4, 2021, Millstone Unit No. 3 experienced two (2) transients caused by the non-safety related turbine control system. Dominion was troubleshooting alarms with the control system in standby mode in accordance with vendor guidance. However, a relay on an electronic card had failed and one of the four main turbine control valves, unbeknownst to operators, was still responding to the control system. As a result, one control valve went full closed then back full open when troubleshooting, resulting in reactor power decreasing to approximately 83% and returning to full power
- August 20, 2021 Millstone Units No.2 and No. 3 reduced power to 82% during tropical storm Henri in order to provide additional margin for seawater cooling systems to main condensers affected by marine fouling of main condenser due to the storm.

Council Assessment

Based upon the information presented and detailed in the minutes, the Council did not identify any safety concerns associated with these operational events and noted operator performance in response to the events was strong. However, the Council notes the number of unplanned operational events continues to be high. In its review of these transients, the Council identified potential trends in the causes and contributors to these events. The Council will continue to monitor performance at Millstone with respect to these issues and trends:

- The Council continues to see issues resulting from quality and performance issues associated with vendor products, guidance and performance.
    - The unplanned transients of Millstone Unit 3 in January and February of 2021 resulted from inadequate vendor review of troubleshooting plans. The vendor had concluded there was no risk for control valve movement.
    - The unplanned manual reactor shutdown of Millstone Unit 3 in June of 2021 was required to replace a reactor coolant pump seal. Dominion had installed new passive seals to reduce leakage. However, since, installation, the seal's performance has challenged operations, requiring a more frequent replacement schedule, including this emergent shutdown to replace a failing seal.
    - During startup from the June 2021 maintenance outage, Dominion replaced a main turbine bearing experiencing higher temperatures due a degraded flow channel that Dominion attributed to a manufacturing defect.
- The Council notes turnover in station personnel continues to be 30 to 50 staff per year. The Council noted that some operational occurrences may have been impacted by loss of experienced personnel. The Council will monitor performance to identify if any other events may be impacted by a loss of organizational knowledge:
    - Conducting troubleshooting on the Millstone Unit No. 3 turbine control system at 100% power did not allow any margin for error. While the Council recognizes that a detailed troubleshooting plan including technical and vendor reviews was used and the turbine was placed in a mode believed to bypass the system, several members of the Council believe that it is generally prudent to reduce reactor power prior to troubleshooting on any systems that could change reactivity.
    - One NRC violation was identified in June 2021 when two Millstone workers improperly entered a posted High Radiation Area without knowledge of radiation levels or a proper briefing as required by station procedures.
    - The increased reliance on vendors with reduced staffing may leave the station vulnerable to vendor performance and quality issues.
    - The Council noted that the 2-year Associates Degree program in Nuclear Studies at Three Rivers Community College continues to provide a pool of workers trained in nuclear power and this program should continue to be supported. As of 2021, The station has employed over 450 graduates of this program.

- The Council noted there was a repeat failure of a check valve in one of the two steam supply pipes to the Millstone Unit No. 2 turbine driven auxiliary feedwater (TDAFW) pump that resulted in Dominion making two reports (on November 6 and 11, 2021) to the NRC pursuant to 10 CFR 50.72 that the plant was in an unanalyzed condition. The TDAFW pump is a risk significant component important to safety. The Council will monitor Dominion's response to and the NRC's assessment of this issue. In particular, the Council will monitor to determine if and to what extent these failures were impacted by the loss of experienced personnel or attributable to vendor performance.
- The Council noted that they reviewed 26 items of NRC correspondence in 2021 including inspection reports, licensing actions, exemptions, and informational notices. This is down from the 46 items in 2020 which the Council noted was high. NRC correspondence and licensing actions appear to have returned to the historical average – 14 in 2019 and 31 in 2018.
- The NRC has approved Millstone Unit No. 3 to operate at approximately 1.6% higher power - approximately 18 MWe and 54 MWth. The Council will monitor plant performance for any incidents that may be related to operation at this higher power level.
- The operating licenses for both Millstone Unit No. 2 and Unit No. 3 have been extended from the original 40 years to 60 years. Millstone Unit No. 2 is currently in its period of extended operations. Dominion briefed the Council that they have extended operating licenses to 80 years for their nuclear units in Virginia. While they have not decided whether to extend the operating licenses for the Millstone Units, they are making capital investments that will support extending the licenses beyond 60 years. The Council continues to monitor information related to aging management of the plants and on regulatory issues related to extending the licenses for plant operations to 80 or 100 years.

Emergency Events

Dominion did not declare any emergency events at Millstone in 2021. However, the NRC identified one finding associated with Dominion preparations for tropical storm Ida. On September 1, 2021, when the remnants of Hurricane Ida moved through the area, Unit 2 experienced a significant rainfall event. Official forecast information from the Connecticut Division of Emergency Management and Homeland Security (DEMHS) and the National Weather Service (NWS) had predicted rainfall rates that could meet the criteria for a local intense precipitation (LIP) event. An LIP event is defined as "rainfall greater than or equal to 3 inches in a 6-hour period within the next 12-hour period." However, Operators at Unit No. 2 did not initiate actions in response to a predicted LIP event until 8:15 p.m. by which time the consequential rainfall event was in progress. NRC inspectors noted that the flood door to the direct current switchgear room, which contains the safety-related batteries, inverters, and chargers, was not reported closed until 10:43 p.m. Moreover, flood gates number 5 (Unit 2 Health Physics Facility Door) and number 6 (Auxiliary Building Railroad Access Building door) were not closed during the LIP event. This resulted in flooding of the Unit 2 radiologically controlled area, but no actual adverse impact to safety-related structures, systems, or components. Historical weather data from the Groton airport indicates that 2.89 inches of rain fell in a 6-hour period, 3.21 inches fell in a 7-hour period, and 3.57 inches fell in a 9-hour period.

Environmental Events

There were no environmental impact events at Millstone in 2021.

COVID-19 Public Health Emergency Response

Dominion also briefed the Council on its continued response to the COVID-19 Public Health emergency (PHE). Dominion stated that staffing in operations, security, health physics, and emergency response remained above minimum required levels. Dominion implemented enhanced public health measures at the site to contain the spread of the virus. These included temperature monitoring required for site access, maximized social distancing, required face coverings, remote telework where possible, testing of over 900

station personnel, and enhanced screening of vendors from other states. Dominion has increased test access for all station personnel. Dominion received several exemptions from the NRC to defer large scale emergency response and security drills to minimize potential for transmission related to the additional personnel involved in integrated exercises. In 2021, Dominion has since successfully completed the emergency response and security exercises. The Council also notes that Dominion has been active in vaccine distribution for critical workers. By the end of 2021, over 90% of station staff has been fully vaccinated.

Advanced Nuclear

The Council received a briefing on the recent developments in deployment of advanced nuclear reactors.

Congress has recently initiated actions for an advanced nuclear power program as one tenant in the overall plan to reduce carbon emissions. The Nuclear Energy Innovation Capabilities Act (NEICA) of 2018 defined advanced reactors and the potential improvements as compared to the existing light water reactors. NEICA authorized "a program to enable the testing and demonstration of reactor concepts to be proposed and funded by the private sector." Since NEICA's enactment, the Nuclear Energy Innovation and Modernization Act (NEIMA, P.L. 115-439) was signed into law in January 2019. NEIMA's main purpose was "to provide a program to develop the expertise and regulatory processes necessary to allow innovation and the commercialization of advanced nuclear reactors." NEIMA directed the U.S. NRC to develop within the existing regulatory structure procedures and processes for licensing of advanced commercial reactors as well as research and test reactors. Moreover, not later than December 31, 2027, the U.S. NRC is to "complete a rulemaking to establish a technology-inclusive, regulatory framework for optional use by commercial advanced nuclear reactor applicants for new reactor license applications."

The Council noted there are studies currently being conducted by the National Academies of Science, Engineering, and Medicine (NASEM) related to advanced reactors:

- Merits and Viability of Different Nuclear Fuel Cycles and Technology Options and the Waste Aspects of Advanced Nuclear Reactors[2]
- Laying the Foundation for New and Advanced Nuclear Reactors in the United States
- Bringing Fusion to the U.S. Grid

While the Council believes that nuclear power provides a critical resource in decarbonizing the electrical grid and mitigating the effects of climate change, the Council notes that Connecticut General Statute Sec. 22a-136 prohibits the construction of additional nuclear power facilities in the state until the Commissioner of Energy and Environmental Protection finds that the United States Government has identified and approved a demonstrable technology or means for the disposal of high level nuclear waste.

[2] One member of the Council, Mr. Semancik, is a member of this NASEM committee.

Connecticut Yankee

The Connecticut Yankee Atomic Power Company (CY) plant began commercial operation in 1968 and produced more than 110 billion kilowatt-hours of electricity during its 28-year operating history. In 1996, the CY Board of Directors voted to permanently close and decommission the power plant. After two years of planning and preparation, actual decommissioning began in 1998 and was completed in 2007. CY has operated the NRC licensed Independent Spent Fuel Storage Installation (ISFSI) at the Haddam Neck site since 2004. The spent nuclear fuel and GTCC waste at the ISFSI facility is stored in 43 dry casks containing dual purpose canisters licensed by the NRC for both storage and transportation. In 2021, the generic storage license for the dry cask storage system was extended for another 40 years (through 2061). The U.S. Department of Energy remains obligated under the Nuclear Waste Policy Act and by contract with CY to remove and dispose of the spent nuclear fuel and high-level radioactive waste.

CY Site Update:

There were no ISFSI lost time accidents, OSHA recordable injuries, or first aid cases in 2021.

CY implemented COVID-19 Pandemic related response actions that included health screening prior to site access, social distancing practices, enhanced cleaning/disinfection schedules, and vaccinations.

ISFSI Pad Repair work continued in 2021. ISFSI pad evaluation by an independent engineering firm concluded that the pad was sound at depth and not subject to degradation mechanisms other than the surface delamination associated with improper finishing of the pad at construction. The results were incorporated into a pad Functionality Assessment.

2021 Emergency Plan Exercise:

The CY exercise was successfully held on September 23rd (phase 1) and October 7th (phase2). This year's Drill resumed the normal in-person format. CY maintained pandemic protective strategies in accordance with local and federal guidelines, and site screening controls (temperature check and questionnaire) were performed for all personnel to identify and prevent potentially infected personnel from entering site. The screening applied to all participants who attend the Drill to minimize pandemic risks.

NRC Inspections

The NRC site inspection occurred during the week of September 21st, 2021. No findings of significance were identified.

Decommissioning:

Millstone - No significant decommissioning activities were conducted at the unit during 2021.
Connecticut Yankee – Normal operations, no regulatory findings were identified during 2021.

High Level Nuclear Waste:

U. S. Department of Energy

In November 2021, the Office of Nuclear Energy (NE), U.S. Department of Energy (DOE), issued a request for information (RFI) on how to site Federal facilities for the temporary, consolidated storage of spent nuclear fuel using a consent-based approach. DOE anticipates that communities; governments at the local, State, and Tribal levels; members of the public; energy and environmental justice groups; organizations or corporations; and other stakeholders may be interested in responding to this RFI. The DOE's resuscitation of its consent-based siting program follows Congress's passing of the Consolidated Appropriations Act of 2021, which provides funding and directs the DOE to move forward with interim storage activities. A Funding Opportunity Announcement is also expected in conjunction with the issuance of the RFI for those willing to engage with DOE to discuss the potential for hosting a federal Consolidated Interim Storage (CIS) facility. The funding would be made available to facilitate informed engagement of interested entities regarding the CIS issue.

U. S. Congress

FY 2021 Funding Bills

The U.S. House and Senate FY 22 Energy and Water Development Appropriations bills largely endorsed the Administration's roughly $27.5 million FY 22 budget request of $20 million for CIS and $7.5 million for overseeing Yucca Mountain and managing the Nuclear Waste Fund. One notable difference between the House and Senate bills is the House bill proceeds under existing law that links progress on CIS to progress on establishing a geologic repository at Yucca Mountain. As in the past, the Senate bill includes language to establish a federal CIS facility with a focus on SNF from shutdown reactor sites. .

Spent Fuel Authorization Legislation

There has been no movement since the July on the U.S. House and Senate bills generally known as the STRANDED Act (Sensible and Timely Relief for America's Nuclear Districts' Economic Development Act) introduced in the previous Congress and reintroduced in this Congress. The bill is designed to assist nuclear closure communities and is an adjunct to a program with similar goals administered by the Department of Commerce. A number of the cosponsors are members of the New England delegation.

On September 28, 2021 Senator Edward Markey (D-MA), and Congressman Mike Levin (D-CA) introduced the Nuclear Waste Task Force Act which would create an approximately 30-member panel under the auspices of the Environmental Protection Agency to develop clear guidelines on what constitutes consent in a consent-based siting process.

On July 21, 2021 Congressmen Mike Levin (D-CA) and Rodney Davis (R- IL) announced the formation of the Spent Nuclear Fuel Solutions Caucus. The stated purpose of the bipartisan caucus is to address the challenges associated with stranded commercial spent fuel across the country and serve as a forum where House members can come together outside of committees to make headway on the issue, regardless of whether or not they have a preferred solution. There have been no formal meetings of the caucus yet.

GAO Report to Congress

On September 23, 2021 the US Government Accountability Office (GAO) issued the report,[3] "Commercial Spent Nuclear Fuel, Congressional Action Needed to break Impasse and Develop a Permanent Disposal Solution" to Congress that largely recommends that Congress amend existing nuclear waste policy to enact the recommendations of the Blue Ribbon Commission on America's Nuclear Future 2012 report. Of note, unlike most GAO reports this one was not requested by a Member(s) of Congress but was initiated by the GAO. The report, in part states:

> *"What GAO Found*
> *Congress needs to take action to break the impasse over a permanent solution for commercial spent nuclear fuel—used fuel removed from nuclear power reactors—according to experts GAO interviewed. Specifically, most experts said Congress should (1) amend the Nuclear Waste Policy Act of 1982 (NWPA) to authorize the Department of Energy (DOE) to implement a new consent-based process for siting consolidated interim storage and permanent geologic repository facilities, and (2) restructure the Nuclear Waste Fund to ensure reliable and sufficient funding. Experts highlighted concerns about the effect of the continuing impasse on environmental, health, and security risks; efforts to combat climate change; and taxpayer costs. For example, the amount the federal government will have to pay to owners to store spent nuclear fuel at reactor sites will continue to grow annually…"*

U. S. Nuclear Regulatory Commission

Private Consolidated Interim Storage (CIS) License Applications

On September 13, 2021 the NRC issued a license to Interim Storage Partners (ISP) a partnership between Waste Control Specialists and Orono, Inc. to construct and operate a Consolidated Interim Storage (CIS) facility for spent nuclear fuel in Andrews County, Texas. The license authorized the company to receive, possess, transfer, and store up to 5,000 metric tons of spent fuel and 231.3 metric tons of Greater-Than-Class C low-level radioactive waste for 40 years. The NRC issued the license days after Texas Governor Greg Abbott signed House Bill 7, which was co-authored by Texas Rep. Brooks Landgraf (R-Odessa) and passed by the Legislature during a special session. HB 7 bans the storage of high-level waste in Texas. In a lawsuit filed shortly after, Gov. Abbott and the Texas Commission on Environmental Quality asked a U.S. appeals court to vacate the license.

The NRC has delayed its final review of a similar application by Holtec International (Holtec) submitted for a specific independent spent fuel storage installation license to construct and operate the HI-STORE Consolidated Interim Storage (CIS) Facility, in Lea County, New Mexico until 2022.

In addition to a license, both projects will have to weigh economic/political factors regarding whether to move forward with CIS facility construction.

Decommissioning Rulemaking

The Nuclear Regulatory Commission approved a proposed rule on November 3, 2021 to amend agency regulations for nuclear power plants transitioning from operations to decommissioning. The proposed rule will be published for public comment in the Federal Register following changes directed by the

[3] https://www.gao.gov/assets/gao-21-603.pdf

Commission. Current NRC regulations establish safety requirements for the commercial operation of nuclear power plants. However, the regulations do not reflect the lower safety hazard following removal of fuel from the reactor during decommissioning. As a result, the NRC has allowed incremental changes to various requirements – including emergency preparedness – through exemptions and license amendments. The proposed rule would implement specific regulatory requirements for these steps. In approving the proposed rule, the Commission disapproved two proposals put forward by the NRC staff regarding management of spent nuclear fuel. It disapproved the staff's recommendation to generically allow plant operators to use decommissioning trust funds to manage and decommission their spent fuel storage facilities. The Commission also disapproved the staff's recommendation to remove preliminary approval and final NRC review of a licensee's Irradiated Fuel Management Program.

The Council notes the significance of decommissioning rulemaking with respect to the ultimate state of Millstone Station. The Council will review the proposed rule when it is made available for public comment and encourages DEEP to review and coordinate comments from relevant state agencies.

Council Activities in 2021

As required by CGS16-11a (PA 96-245) as amended, the Council held four public meetings. The purpose of these meetings was to provide a venue for discussion of issues relating to the safe operation of the state's nuclear power plants. The meetings in 2021 were held virtually due to public health restrictions imposed in response to the COVID-19 PHE. These virtual meetings remained open to the public. Detailed meeting minutes are included in Appendix 2.

- March 18, 2021 (virtual via MS Teams): This was a joint meeting with the NRC Region I staff and focused on the Annual Assessment Report of Millstone Power Station Units 2 and 3 for the four quarters of calendar year 2020. It was reported that overall both units were operated in a manner that preserved public health and safety and fully met NRC cornerstone objectives.

- June 17, 2021 (virtual via MS Teams): Dr. Todd Allen, faculty member and chair of the Nuclear Engineering & Radiological Sciences Department at the University of Michigan and a senior fellow at Third Way, a DC-based think tank, supporting their clean energy portfolio, on Developments with Advanced Reactors briefed the Council on 21st century nuclear power.

- September 15, 2021 (virtual via MS Teams): Dominion Nuclear Connecticut representatives provided an update of activities at Millstone Power Station.

- December 16, 2021 (via Zoom): The Council discussed trends and observations for preparing the 2021 annual report.

Millstone 1 Decommissioning Advisory Committee (M1DAC): Since Millstone 1 remains in Safe Storage (SAFSTORE) and no significant activities were conducted at the Unit during the past calendar year, M1DAC did not meet in CY2021.

FSAC Meeting:
The CY Fuel Storage Advisory Committee meeting to be held in May 2021 was postponed to 2022 due to the PHE. The next FSAC meeting is scheduled to be held in Haddam on May 5, 2022.

Recommendations

State

1. DEMHS and DEEP should continue to address any emergency preparedness issues at Connecticut's nuclear sites.
2. DEEP, in conjunction with Connecticut State Police should continue to address any security issues at Connecticut's nuclear sites.
3. DEEP should continue radiological and environmental monitoring of Connecticut's nuclear sites.
4. The Governor, General Assembly, DEEP, and the Council should continue to insist that the NRC continue vigilant oversight of Connecticut Yankee and Millstone Power Station sites for as long as high-level nuclear waste remains on site.
5. The Governor, General Assembly, and DEEP should encourage the federal government to develop a solution to the spent fuel storage. Specifically, The Governor, General Assembly and DEEP should endorse a nuclear waste strategy that includes consent based consolidated interim storage that gives priority to removal of waste from permanently shutdown reactors.
6. Elected officials should work with the Council to make appointments necessary to fill vacant Council positions.
7. DEEP should coordinate review and comment on NRC's proposed decommissioning rule to ensure the interests of the state are represented.

The Council

1. Continue to monitor the stability of the Employee Concern Program and Safety Conscious Work Environment and Corrective Action Program at Millstone Power Station.
2. Continue to monitor operations and activities at Millstone Power Station and Connecticut Yankee Site, including the dry cask storage programs.
3. Continue to encourage the development of a solution to the problem of Spent Nuclear Fuel, High Level Waste and Greater Than Class C Low-Level Radioactive Waste and the safe transfer of this nuclear waste from Connecticut. This solution should include the establishment of a consent based consolidated interim storage that gives priority to removal of SNF and GTCC waste from permanently shutdown reactor sites and transfers title of SNF to DOE upon receipt.
4. The Council has identified and will monitor the following trends to ensure safe operations of Millstone Power Station
   a. Elevated number of operational events
   b. Impact of staffing changes and loss of organizational knowledge
   c. Elevated number of vendor quality and performance issues.
5. The Council believes that Dominion Energy continues to respond appropriately to the COVID-19 Public Health Emergency (PHE) to protect critical workers required to safely operate the plants, provide security, and respond to emergencies.

Conclusions

Dominion continues to safely operate the nuclear plants at Millstone Power Station. Spent nuclear fuel is safely stored and monitored in wet and dry storage at Millstone Power Station and in ISFSI at Connecticut Yankee. NRC and DEEP oversite provide effective oversite of activities. All oversite entities and stakeholders must continue vigilant oversight of Connecticut Yankee and Millstone Power Station sites for as long as high-level nuclear waste remains on site. Each must encourage the federal government to develop a consolidated interim storage solution to the spent fuel storage problem that prioritizes removal of Spent Nuclear Fuel (SNF) and Greater Than Class C (GTCC) waste from permanently shut down reactor sites and includes transfer of the SNF title to DOE upon receipt.

Appendix 1 Nuclear Energy Advisory Council Membership

Chair, Representative Kevin Ryan Oakdale: OD, Pennsylvania College of Optometry. State Representative serving the towns of Bozrah, Montville and Norwich in the 139th House District, Adjunct Faculty, University of New Haven.

Arnold "Skip" Jordan. Noank: BSME, Maine Maritime Academy; MBA, Boston University. Retired, former Vice President Dominion Support Services and Site Vice President Millstone Station. Former Reactor Operator at Millstone Unit 2.

John McGunnigle East Lyme: BS, Computer Science, US Naval Academy; MS Operations Research, US Naval Postgraduate School; former Commanding Officer, Nuclear Powered Submarine; Former Submarine Squadron Commander; Navy Captain.

Senator Catherine Osten Sprague: Mohegan Community College; State Senator and Deputy President Pro Tempore representing the residents of the 19th state Senatorial District communities of Columbia, Franklin, Hebron, Lebanon, Ledyard, Lisbon, Marlborough, Montville, Norwich, and Sprague

Craig Salonia Haddam**:** BS in Medical Technology from Northeastern University. Account manager and trainer for GE Health care Life Sciences division.

Deputy Chair, Jeffrey Semancik Groton: BS Physics, US Naval Academy. MS, Electrical Engineering, RPI. MBA UCONN. Former qualified engineer, nuclear powered aircraft carrier. Former Senior Reactor Operator at Millstone Unit 3. Director, Radiation Division, Department of Energy and Environmental Protection representing Commissioner Dykes.

John W. (Bill) Sheehan Waterford: BS, Naval Science, US Naval Academy; MBA, Rensselaer Polytechnic Institute; former Commanding Officer, Nuclear powered submarine.; retired Navy Captain

James Sherrard Mystic: PhD Nuc. & Mech Eng. MIT/UCONN. Chairman, Nuclear Engineering Technology Department, Three Rivers Community College.

Raymond D. Woolrich Waterford: BS, Nuclear Science, US Naval Academy; MS Computer Systems and Financial Management, US Naval Postgraduate School; former Commanding Officer, Nuclear Powered Submarine; retired Navy Captain; former Naval Analyst, Sonalysts, Inc.

Member on sabbatical in 2021:

Royce W. James, New London, PhD, Physics, Stevens Institute of Technology; MS, Applied Physics, Columbia University; BS, Physics, New Mexico State University. Physics Professor, U. S. Coast Guard Academy

Appendix 2 Nuclear Energy Advisory Council Meeting Minutes

NUCLEAR ENERGY ADVISORY COUNCIL
March 18, 2021 4 PM
Virtual Meeting

MINUTES

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

Members not present:
None

1. **Call to Order of Meeting**
   NEAC Alt Chair Semancik called the meeting to order at 4:00 PM via webinar/telephone conference.

2. **Program** – Briefing on Millstone Power Station Annual Assessment by US Nuclear Regulatory Commission (NRC): D. Schroeder, Chief, Projects Branch 2, Division of Reactor Projects; J. Fuller, Senior Resident Inspector; E. Bousquet, Resident Inspector; E. Allen, Resident Inspector; R. Guzman, Project Manager, Plant Licensing Branch I. (Council's Requested Topics, NRC Notice of Public Meeting, and Meeting Presentation attached)
   a. Mr. Schroeder introduced himself and discussed his 25 years of experience. He noted that the NRC has three fulltime resident inspectors (RIs) with unfettered access to all areas of Millstone Power Station. These RI's conduct the baseline inspections and supplements them with technical specialists from the Region 1 office in King of Prussia, PA. He noted that some NRC inspections were modified in response to the COVID-19 pandemic in order to minimize spread of the virus. Some inspections but technical specialists have been done virtually, but that RI's always maintained a presence at the station and their time at the plant is now approaching pre-pandemic levels. The NRC conducted over 8200 hours of inspections in 2020.
   b. Mr. Schroeder briefed the Council on overall NRC assessment of performance related to Dominion Energy's operation of Millstone. Mr. Schroeder stated that Millstone continues to operate safely, protect public health and safety, and protect the environment. Millstone Units 2 and 3 are both in the Licensee Response Column of the Regulatory Response Matrix (the highest level of performance) and will therefore remain under baseline inspection. All NRC performance indicators (PIs) are Green. The NRC has not identified any cross-cutting issues. The NRC identified eight inspection findings,- six by RIs and two by

technical specialists. Six of the findings were non-cited violations of very low safety significance (green). Two were severity level IV violations.

i. One PI related to unplanned scrams[1] per 7000 hours was approaching the green to white threshold due to two scrams at Millstone in 2020. Margin to the white threshold will be regained in 2021 with no further scrams.
ii. Mr. Schroeder provided an update to the PI for Unit 3 Alternating Current (AC) Emergency Power Systems that was discussed at the 2020 Council meeting as near the white threshold licensee has taken corrective actions in response to 2019 findings and performance of the AC emergency power systems at Millstone is improving.

c. Mr. Schroeder state the NRC has no Safety Conscious Work Environment (SCWE) concerns for 2020. The NRC assesses safety culture as part of Problem Identification and Resolution (PI&R) inspections. During the last PI&R inspection (December 2020) the NRC inspection team determined Dominion's corrective action (CA) process was effective and that there were no challenges to SCWE with Millstone staff willing to raise concerns. There were three allegations in 2020 which is below the industry average. The next PI&R inspection is scheduled for September 2022. NRC RI's remain available and accessible to all staff working at Millstone.
d. Mr. Schroeder discussed response to COVID-19 public health emergency (PHE) by NRC and Dominion.
    i. NRC maintained a focus on health and safety of employees while assuring safe and secure operations of nuclear power plants. Many NRC staff worked remotely. RI's continued to work at sites following appropriate public health protocols. On site RI hours are now approaching pre-pandemic levels. Throughout NRC communicated with its staff and nuclear power plant operators.
    ii. The NRC has requirements for minimum staffing in operations security and emergency response and recognized that some facilities may need to request an exemption to relax these requirements due to COVID issues. At Millstone, however, minimum staffing was not challenged, and Dominion maintained an adequate margin to staffing limits throughout 2020.
    iii. Dominion took adequate protective measures for the PHE including more frequent cleaning, limiting business travel, virtual meetings and telework where possible. In addition, they reduced the scope of work in both their spring and fall refueling maintenance outages to limit the number of additional personnel on site. Prior to the spring 2020 outage, Dominion tested over 500 operations and other critical personnel. The NRC RI's

[1] A scram is an automatic reactor shutdown accomplished by rapid insertion of all control rods in response to a plant parameter exceeding a protection system setpoint.

have not identified any adverse human performance issues related to COVID actions.

iv. In November 2020, Millstone experienced a sharp increase in COVID cases. The majority of cases were limited to two work groups. The licensee managed the outbreak well and cases decreased in December and January. The NRC RI's did not identify any adverse effects to nuclear safety or security due to this outbreak.

v. Two NRC inspections were deferred due to the PHE, - the offsite emergency response exercise was deferred from June 2020 to June 2021; the Unit 2 licensed operator requalification inspection was deferred from November 2020 to September 2021. Other PHE related actions approved by the NRC included exemption from annual security force-on-force exercise and a license amendment allowing the one-time deferral of steam generator (SG) tube inspection at Unit 3.

e. Mr. Fuller introduced himself and his RI staff. He has 20 years of experience with the NRC and became the Senior Resident Inspector (SRI) at Millstone in 2017. Mr. Allen has 18 years nuclear experience and has been assigned to Millstone in summer 2019. Mr. Bousquet has over 15 years of nuclear experience and was assigned to Millstone in 2020.

f. Mr. Fuller discussed the power history of Millstone Units 2 and 3. He noted that the RIs always conduct independent evaluation of plant operations and reviews for startup. Mr. Fuller discussed the increase in operational occurrences (shutdowns, down powers and scrams) during 2020. He noted that four of the six operational events were related to weather. During and operational challenges, Mr. Fuller stated RI's respond to control room to observe plant and operator response. NRC RIs did not identify any safety significant findings.

i. Both the NRC and Dominion have procedures and protocols to follow when impending weather is forecasted. These procedures were followed. NRC RI's noted the plants responded as designed and the operators responded well t0 the conditions and challenges. In response to weather related challenges, Mr. Fuller noted Dominion has conducted a collective significance determination which noted the introduction of an invasive red seaweed that releases when Long Island Sound temperatures increase. Dominion has several corrective actions for procedural and plant changes.

ii. Main effect is the system to filter the seawater have become overwhelmed during recent storms. This resulted in reduced cooling to the non-safety related main condenser. In order to regain thermal margin in the condenser, the plants must reduce power.

iii. The two other shutdowns resulted from equipment issues in non-safety related portions of the plant at Unit 3.

1. April 1, 2020 – Automatic scram due to main generator electrical ground fault caused by leakage past a degraded seal on the iso-

phase system. Vendor had not installed drain in correct portion of the duct which allowed water to build up.

2. Dec 13, 2020 – Dominion reduced power and eventually shutdown in order to facilitate repairs to a non-safety related feedwater heater.

iv. NRC Technical experts are reviewing the root cause evaluations related to the plant operational occurrences and the collective significance determination. Inspection results will be included in the 1Q21 integrated inspection report.

g. Mr. Fuller discussed the one declared emergency event, - an Unusual Event declared on November 8, 2020 due to a 3.6 magnitude earthquake centered off the coast of Massachusetts. Unit 3 control room operators sensed the ground movement and received reports from across the station. The event was properly classified per licensee procedures. Unit 2 remained online at 100% power. Unit 3 was still shutdown nearing end of scheduled refueling maintenance outage. Licensee engineering staff walked down plant safety systems. No damage was detected and the event was terminated later that day.
   i. He noted a 3.6 magnitude earthquake is approximately 5% of the Operational Basis earthquake (OBE) that the plant design basis assumes will occur once in the life of the plant. The plant is designed to withstand a design basis earthquake (DBE) that is even higher than the OBE.
   ii. During independent walkdowns, RI's noted several examples of storage of equipment (ladders, toolboxes, etc.) that were not properly restrained to prevent seismic interaction as required by plant procedures. NRC had previously in 2020 issued a Green (low safety significance) non-cited violation to Millstone for failure to follow seismic housekeeping procedures.

h. Mr. Fuller discussed three topics requested by the Council
   i. Follow-up on discoloration of spent nuclear fuel (SNF) dry storage cask welds discussed with the Council during the 2019 meeting, - during 2019 SNF dry storage campaign, NRC RI had identified discoloration of final closure weld and questioned whether it interfered with dye penetrant inspection. Dominion properly entered issue into their CA system. Dominion engineering in consultation with cask vendor evaluated the condition and determined that it was cosmetic only, not relevant to integrity of the weld, and did not interfere with dye penetrant testing. NRC weld experts conducted an independent review and determined the licensee evaluation was reasonable and that there were no safety concerns. This was documented in November 2020 report.
   ii. Voluntary Retirement Program (VRP) Impacts, - RI's have not identified any regulatory issues attributable to the Dominion VRP and loss of knowledge. He noted that Dominion is managing and has re-hired some key experts as contractors to work on specific projects.

iii. Unit 3 Turbine Control System troubleshooting in 2021. In January and February 2021, Millstone Unit 3 experienced 2 transients caused by the non-safety related turbine control system. Dominion was troubleshooting alarms in accordance with vendor guidance. In particular, vendor guidance supports troubleshooting on line provide the turbine control system is placed in "standby load control" which is supposed to electrically isolate the control system. Operators placed the turbine in standby per procedures and verified all of the required indications. However, a relay on an electronic card had failed and one of the four main turbine control valves was, unbeknownst to operators, was still responding to the control system. As a result, one control valve went full closed then back full open when troubleshooting resulting in reactor power decreasing to approximately 83% and returning to full power. RI's noted the plant responded as designed and operator performance was proper. The NRC is still conducting its inspection of these transients and will complete this during first quarter of 2021. Inspection results will be included in the 1Q21 integrated inspection report.

i. Mr. Guzman introduced himself and provided his background of 25 years of nuclear experience in the US Navy and NRC. He discussed specific licensing actions as requested by the Council:
   i. Increase in the number of licensing actions in 2020. There were 18 Millstone licensing actions in 2020, up from 12 in 2019. In reviewing the actions, NRC determined the increase was largely attributable to licensing actions associated with COVID-19 PHE. NRC expects 10 to 14 each year based on historical numbers.
   ii. NRC has received a license amendment request from Dominion for a proposed power uprate at Millstone Unit 3. This would increase thermal power of Millstone Unit 3 by 59 MWth. Dominion has requested approval by November 2021 in order to support planned implementation in the spring 2022 refueling outage.
   iii. Dominion has requested a change to the eddy current inspection frequency for Millstone Unit 2 Steam Generator tubes from every 72 to 96 months. This would change the performance from every third refueling outage to every fifth refueling outage.
   iv. Dominion has requested an update to reflect changes to approved methodologies used by the fuel vendor for evaluating loss of coolant accidents and to the fuel peak central temperature for other accidents.

3. **Questions from the Council**
   a. Mr. Semancik asked the NRC to explain how the unplanned scram performance indicator is calculated. Mr. Fuller explained that certain power changes greater than 20% (including shutdowns) are summed and divided by the number of critical hours of operation.

b. Mr. Semancik asked if any of the trips were classified as complicated since the Unit 3 ground fault trip resulted in the loss of one offsite power source and the Unit 3 loss of vacuum trip affected the normal heat sink (the main condenser). Mr. Schroeder explained both the licensee and NRC review all scrams to determine if they are considered complicated using agreed upon criteria. Neither Millstone scram was determined to be complicated, - following the ground fault scram at least one source of offsite power remained available and on the loss of vacuum scram, the tripping of the main turbine removed major steam input to the main condenser and it remained available.
c. Mr. Sheehan asked if Dominion operators attempted to clean the intake screen and remove marine debris during the weather events. Mr. Fuller stated that Dominion prepared in advance for the storms including bringing in extra operators. Currently, some of the equipment used to filter out marine debris and seaweed require manual shifting and cleaning. Operators were stationed and attempted to clean the filters, but were overwhelmed. He noted one of the proposed corrective actions is to modify some of these sea water filtration systems to be automatic.
d. Mr. Sherrard noted many modifications were implemented after the Fukushima disaster and asked if there was any direct correlation with the performance of these systems and the lack of damage following the November earthquake. Mr. Schroeder responded that licensees were required to review their seismic design basis and NRC conducted specific inspections of seismic components, but that no modifications were required at Millstone to meet seismic criteria. Mr. Fuller also noted the November earthquake was such small magnitude as to not challenge any of the plant structures, systems or components.
e. Mr. Woolrich asked for clarification on the troubleshooting of the turbine control system. Specifically, he asked if Dominion had determined the cause of first transient before they conducted the second evolution. Mr. Fuller responded that the licensee thought they understood the cause, but they did not know that only one control valve had moved and that one control valve was not in standby. Mr. Woolrich noted he was bothered that Dominion conducted the trouble shooting on a reactor at full power and that they had not resolved with certainty what happened the first time. Mr. Schroeder noted the Council's concerns and that the NRC was still in process of completing its assessment.
f. Mr. Salonia noted that Mr. Fuller said the OBE was expected to occur once in the lifetime of the plant and asked if that calculation changes when the plant operating license is extended. Mr. Fuller noted that NRC inspection ensure the integrity of safety related structures, systems and components to perform their safety functions. Mr. Schroeder noted that the plant is designed to with stand seismic forces associated with a design basis earthquake in excess of the OBE so no specific changes are required for life extension.
    i. Mr. Woolrich noted that the main issue at Fukushima was the tsunami and subsequent flooding. Mr. Schroeder noted that NRC reviewed the

design basis flooding as well. He also noted licensees added portable flex equipment that could be used if installed equipment was damaged.

g. Mr. Semancik noted that the power change that occurred during the turbine trouble shooting was less than the 20% threshold for the NRC unplanned power change performance indicator. He asked if the NRC reviews the indictor formula to ensure it is properly reflective of protecting public health and safety not just reducing administrative burden on licensees. Mr. Schroeder replied that the PIs are augmented by inspections. They are evaluating the turbine control system troubleshooting transients in the inspection program and have evaluated them against criteria and determined that they do not meet the criteria for escalated inspection. Mr. Fuller also noted that the NRC assesses and audits the regulatory oversight process annually.

h. Mr. Semancik noted the number of weather related events and asked if the NRC is evaluating the impact of climate change on the initiating event frequency and severity of external event and storms. Mr. Schroeder stated that there is no specific periodic review of external events. He noted that the licensees manage their design margins. They evaluate these margins and request specific license changes when necessary such as was done by Dominion to account for changes in Long Island Sound water temperature.

4. **Public Comment.** There were fourteen members of the public present. Mr. Schroeder asked if any members had any questions or comments. There were not public comments or questions.

5. **NEAC Business**

   a. **Approval of Minutes of the December 17, 2020 NEAC meeting.**
   A motion was made to approve the minutes by Mr. Salonia and seconded by Mr. Sherrard. Minutes were approved with no corrections with no objections.

   b. **NRC Correspondence Reviewed since past meeting.**
   The list of NRC Correspondence was reviewed. One comment from NEAC was related to NRC environmental qualification inspection.

      i. Millstone Power Station, Unit No. 2 - Acceptance Review Determination Re: Proposed LAR to Revise the MPS2 TSs for Steam Generator Inspection Frequency (EPID L-2020-LLA-0227) dated December 15, 2020

      ii. Millstone Power Station, Unit No. 3 – Review of the Fall 2018 and Spring 2019 Steam Generator Tube Inspection Reports (EPID L-2020-LRO-0050 AND EPID L-2019-LRO-0106) dated December 16, 2020.

      iii. Millstone Power Station, Units 2 and 3 – Security Baseline Inspection Report 05000336/2020402 AND 05000423/2020402 dated January 11, 2021.

1. Mr. Semancik reviewed the security sensitive version of this report.

iv. Millstone Unit Nos. 2 and 3 - Acceptance Review Determination: Alternative Requests RR-05-04 and IR-4-02, Use of Alternative Pressure/Flow Testing Requirements for SW System Supply Piping [EPID: L-2020-LLR-0158] dated January 12, 2021.

v. Announcement of Generic Fundamentals Examination Section of the Written Operator Licensing Examination for 2021 dated January 12, 2021.

vi. Millstone Power Station, Unit No. 3 - Acceptance Review Determination Re: Proposed LAR to Revise Reactor Core Safety Limit to Reflect WCAP-17642-P-A, Revision 1 (EPID L-2020-LLA-0266) dated January 11, 2021.

vii. Millstone Power Station, Units 2 and 3 – Biennial Problem Identification and Resolution Inspection Report 05000336/2020012 and 05000423/2020012 dated January 14, 2021.

viii. Millstone Power Station, Units 2 and 3 – Integrated Inspection Report 05000336/2020004 and 05000423/2020004 dated February 1, 2021.

ix. Annual Assessment Letter for Millstone Power Station, Units 2 and 3 (Reports 05000336/2020006 and 05000423/2020006) dated March 3, 2021.

x. Millstone Power Station, Units 2 and 3 – Temporary Instruction 2515/194 Inspection Report 05000336/2021012 AND 05000423/2021012 dated March 17, 2021

6. **Adjournment**
Motion was made by Mr. Salonia and seconded by Mr. Sherrard to adjourn; no objections; unanimous vote in favor; meeting adjourned at 5:32 PM.

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

Millstone Annual Assessment Meeting

Welcome!
This meeting will start shortly

If calling in using the phone:
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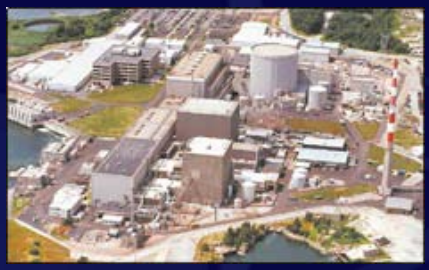
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Millstone Annual Assessment Meeting



Reactor Oversight Process – 2020

Nuclear Regulatory Commission - Region I
King of Prussia, PA
March 18, 2021

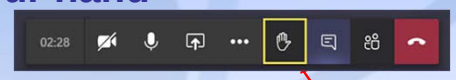
2

Agenda

- **Opening Remarks –** Dan Schroeder
- **2020 Millstone ROP Assessment Summary –** Dan Schroeder
- **COVID–19 Response –** Dan Schroeder
- **Nuclear Energy Advisory Council (NEAC) Items of Interest**
  - **Millstone Resident Inspector Summary –** Justin Fuller
  - **Millstone 2020 Unplanned Power Changes –** Justin Fuller
  - **Notification of Unusual Event (Earthquake) –** Justin Fuller
  - **Millstone Significant License Changes –** Rich Guzman
- **Discussion with members of the Connecticut NEAC –** Dan Schroeder
- **Public Question and Answer –** Dan Schroeder

How To Ask a Question

- **Questions will be addressed during the question and answer session following the presentation and discussion with NEAC,**
- **If you're on your computer, raise your hand to indicate you have a question,**
- **If on the phone, please press *6 to unmute your phone and ask your question**



If You Are Having Technical Issues

- Please contact Technical Support:
  - Mark Marziale
    - (610) 337-5062
    - Email: Mark.Marziale@nrc.gov
  - **- or -**
  - Colleen Picciotto
    - (610) 337-5202
    - Email: Colleen.Picciotto@nrc.gov

Today's Presenters

Daniel Schroeder
Branch Chief
Division of Reactor Projects

Justin Fuller
Senior Resident Inspector

Richard Guzman
NRC Project Manager
Nuclear Reactor Regulation

Opening Remarks

- Three full-time residents assigned to Millstone
- Inspectors have unfettered access to all areas of the site
- Technical specialists conduct additional inspection activities
- Inspectors have adapted to COVID-19 work environment

Millstone 2020 Assessment Summary

- Millstone Units 2 & 3 operated safely and in a manner that preserved the public health and safety and protected the environment
- Millstone Units 2 & 3 remained in the Licensee Response Column of the Action Matrix
- 8,210 hours of inspection and related activities
- All Green Performance Indicators
- 6 Green Non-Cited Violations (NCVs)
- 2 SL-IV Violations

NRC Actions in Response to COVID-19

- Monitoring plant activities through inspections and oversight
- Maintaining emergency response capabilities within Regional Incident Response Centers and NRC Headquarters
- Risk-informing "eyes-on" inspections through residents and regional inspections

NRC Requirements Related to COVID-19

- Minimum Shift Staffing
  - Operators
  - Security
  - Emergency Response Organization
- NRC Coronavirus Website

https://www.nrc.gov/about-nrc/covid-19/index.html

Millstone Response to COVID-19

- Dominion staff has followed CDC prevention guidelines during the national health emergency
- Implemented social distancing guidelines, mask wearing requirements, and encouraged telework for many employees
- Asked employees to stay home if they have symptoms
- Dominion employed COVID-19 Testing

Inspection Impact Due to COVID-19

INSPECTIONS DEFERRED/DELAYED BEYOND CY 2020 DUE TO COVID-19			
Inspection Procedure # - 'Title'	Originally Scheduled Date	New Scheduled Date	Date Required to be Completed By
IP 71114 Exercise Evaluation	June 2020	June 2021	12/31/2021
IP 71111.11B U2 Licensed Operator Requalification Program	November 2020	September 2021	12/31/2021

COVID-19 related licensing actions:

- Temporary and final exemption from the annual force-on-force exercise requalification requirements of security personnel
- Exemption from the biennial emergency preparedness onsite and offsite exercise
- License Amendment for one-time deferral of the MPS3 steam generator (SG) tube inspections for MPS3 SGs A and C from fall 2020 to spring 2022

Connecticut Nuclear Energy Advisory Council

Items of Interest

13

Millstone Resident Inspectors

Justin Fuller
Sr. Resident Inspector

Eben Allen
Resident Inspector

Earl Bousquet
Resident Inspector

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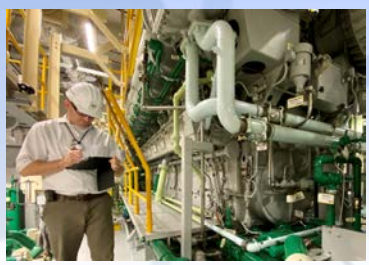
NEAC Item of Interest - Millstone 2020 Unplanned Power Changes

Date	Unit	Impact	Cause
April 1	3	Reactor Trip	Ground Fault
April 13	3	Reactor Trip	Weather Related
Aug. 4	2	76%	Weather Related
Aug. 4	3	43%	Weather Related
Nov. 15	2	83%	Weather Related
Dec. 31	3	Forced Outage	Feedwater Heater Repairs



NEAC Item of Interest – Notification of Unusual Event (Earthquake)

- November 8, 2020
- Magnitude 3.6
- Timely notifications
- Independent walkdowns
- No plant damage
- Seismic housekeeping

NEAC Other Items of Interest

- Spent fuel cask weld discoloration
- 2019 Voluntary Retirement Program (VRP) impact on Millstone performance
- Unit 3 turbine control system troubleshooting

Richard Guzman

NRC Senior Project Manager

Office of Nuclear Reactor Regulation

NEAC Item of Interest – Millstone Significant License Changes

- **Millstone Unit 3 Measurement Uncertainty Recapture Power Uprate**
- **Millstone Unit 2 Steam Generator Inspection Frequency Technical Specification Revision**
- **Millstone Unit 3 Technical Specification Changes – based on Westinghouse Topical Reports**
  - **Core Operating Limits Report for Large Break Loss of Coolant Accident analysis**
  - **Peak Fuel Centerline Melt Temperature Safety Limits**

Office of Public Affairs

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Annual Assessment Meeting Feedback

1. Mail in NRC feedback form that will be emailed to all attendees

- OR -

2. Scan QR Code on back of form with smart device

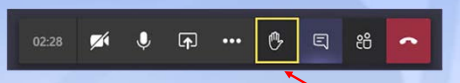
- OR -

3. Through any computer by going to the Public Meeting Schedule and pressing the "Meeting Feedback" link for this meeting, or pressing the "[...more]" link for this meeting and then pressing the "Meeting Feedback" link on the "Meeting Details" page.

Discussion with members of the Connecticut Nuclear Energy Advisory Council

Q&A with Members of the Public

- If on the computer, raise your hand when ready to ask your question,



- If on the phone, please press *6 to unmute your phone and ask your question


This ends the Meeting
Thank You for Attending!
25
03/18/2021
Protecting People and the Environment

NUCLEAR ENERGY ADVISORY COUNCIL
June 17, 2021 6 PM
Regular Virtual Meeting

MINUTES

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

Members not present:
Mr. A. Jordan

1. **Call to Order of Meeting**
   Council Chair Ryan called the meeting to order at 6:03 PM via webinar/telephone conference.

2. **NEAC Business**
   a. **Approval of Minutes of the March 18, 2021 NEAC meeting.**
   A motion was made to approve the minutes by Mr. Sheehan and seconded by Mr. Woolrich. Minutes were approved with no corrections with no objections.

   b. **NRC Correspondence Reviewed since past meeting.**
   The list of NRC Correspondence was reviewed. One comment from NEAC was related to NRC environmental qualification inspection.
      i. Millstone Power Station, Unit No. 3 - Individual Notice Of Consideration of Issuance of Amendment to Renewed Facility Operating License, Proposed No Significant Hazards Consideration Determination, Opportunity to Request a Hearing, and Order Imposing Procedures for Document Access to Sensitive Unclassified Non-Safeguards Information (EPID L-2020-LLS-0002) dated March 26, 2021.
      ii. Millstone Power Station, Unit No. 2 – Review of the Spring 2017 Steam Generator Tube Inspection Report (EPID L-2021-LRO-0006) dated April 27, 2021.
      iii. Millstone Power Station, Units 2 and 3 – Integrated Inspection Report 05000336/2021001 and 05000423/2021001 dated April 29, 2021.

c. **Other Correspondence Reviewed**
    i. UCS-RP-AR-3.21, "Advanced" Isn't Always Better Assessing the Safety, Security, and Environmental Impacts of Non-Light-Water Nuclear Reactors, Union of Concerned Scientists (Lyman) dated March 2021
d. **Council membership** – Rep Ryan discussed his efforts to get appointments for vacancies on the Council. Rep Ryan was re-appointment by the Speaker of the House of Representatives vice his previous appointment from the Majority leader of the Senate. He has provided a second candidate to Speaker Ritter for consideration, but ahs not been able to secure other.

3. **Program** – Briefing by Dr. Todd Allen, faculty member and chair of the Nuclear Engineering & Radiological Sciences Department at the University of Michigan and a senior fellow at Third Way, a DC-based think tank, supporting their clean energy portfolio, on Developments with Advanced Reactors (Dr. Allen's Bio and Meeting Presentation attached) Dr. Allen discussed:
    a. Background on the current drivers to increased interest in advanced nuclear reactors including:
        i. Emissions Imperative – Climate change concerns have increased focus on reducing carbon emissions especially in transitioning from coal to carbon free sources including renewables, carbon capture and nuclear. Recently several environmental Non-Government Organizations (NGOs) and young people are looking towards nuclear to help solve the climate crisis.
            1. Nature Conservancy and MacArthur Foundation both support
            2. Google looking to use for data centers
            3. States incenting existing nuclear to continue to operate or putting new nuclear on grid
        ii. Revenue Imperative – as more countries look to use nuclear power, there is potential for over $1 trillion in overseas commerce
        iii. Security Imperative – In the past (first generation of nuclear power plants), the US had control over who got the technology. New reactor technologies are being marketed by Russia, China, France and the South Koreans. In fact, 2/3 of all nuclear power plants under construction are Chinese or Russian design. In order to ensure plants around the world are safe and not used for development of nuclear weapons, we want them built to US standards.
        iv. Resilience Imperative – in order to ensue reliability of the US electric grid, nuclear power is needed to ensure we are not over-reliant on any single fuel source or intermittent fuel sources.
        v. Social Imperative – Need to change the narrative to improve acceptance.
    b. Insights on what has changed in recent years with respect to nuclear.

i. Expanded product from electricity only to needed for process heat for industries such as petrochemical and hydrogen production. Existing Arizona and Minnesota nuclear plants have entered into studies with Department of Energy (DOE) to produce hydrogen. Since this heat often requires temperatures in excess of light water reactor (LWR) steam, advanced reactors being considered.
ii. Changes in business model. In the past, nuclear industry has relied on government to develop and test reactors then hand the design over to the industry. We are now seeing a new type of nuclear product being developed by entrepreneurial companies in commercial competition with each other.
iii. Private-Public Partnership: Government incentives focused on helping commercial companies deploy new reactors.
    1. Gateway for Accelerated Innovation in Nuclear (GAIN) – DOE program to make government research facilities available to support commercial companies
    2. Nuclear Energy Innovation and Modernization Act (NEIMA) and Nuclear Energy Innovation Capabilities Act (NEICA) – legislation requiring modernization of licensing and supporting commercial industries with access to national laboratories.
        a. Nuclear Regulatory Commission (NRC) is actively doing work to regulate new reactors (non-LWRs) in a more efficient manner to reduce regulatory burden.

c. Broad Classes of New Reactors
    i. Small Modular Reactors (SMRs)
        1. Water cooled but less than 300 MWe.
        2. Business model
            a. Modular design up to 12 modules at one sight
            b. Start selling power when first module completed
            c. Reduced financial and construction risk and cost of loans
            d. Only have to shutdown one module for refueling and maintenance vice the entire site
            e. Take advantages of learning curves during construction to reduce cost of each module
            f. Allow the station to load follow
            g. Small emergency planning zones (site boundary) since each module has a smaller source term (less radioactive material)
    ii. MicroReactors
        1. 1 to 20 MWe
        2. Higher cost but useful for remote areas or military use
        3. Higher price point but cheaper and more reliable than imperoting diesel fuel

4. Being considered for serer farms
5. mobile

4. **Questions from the Council**
    a. Mr. Sheehan asked what fuels are being considered for new advanced reactors and what is the state of testing and development. Dr. Allen responded that advanced reactors designers are using several fuel types including
        i. LWR fuel – idea is that using same fuel as existing fleet of nuclear power plants will improve deployment time for LWR SMRs
        ii. TRISO (TRi-structural ISOtropic particle) fuel – mm sized fuel particles surrounded by SiC and graphite formed into either pebbles or cylindrical form. The idea is that this moves the containment to the fuel particle to contain fission products. An advantage is that it produces a lower power density so it can't easily be melted but this also requires a larger reactor. TRISO fuel has been tested in gas cooled reactors in both US and Germany. DOE ran decades-long test program. TRISO is ready for commercialization.
        iii. Metallic Fuel – cylindrical fuel in metal cladding. It has a lower melting temperature but much better thermal conductivity. The fuel and clad are typically bonded with sodium; so, it can't go directly to a repository and must be re-processed. There is enough DOE test data that some companies believe they can license it.
        iv. Liquid fuels – molten salt with nuclear fuel homogenously mixed throughout. This is more experimental with little data. The fuel is circulated along with the coolant; so, more issues with radiation levels, delayed neutrons and chemical reactions.
    b. Mr. Sheehan noted the Council had also reviewed a recent Union of Concerned Scientists (UCS) report on advanced nuclear reactors that had concerns with molten salt reactors (MSRs) and noted the US Navy had also determined that they were not viable. For MSRs, Dr. Allen noted that the DOE simulated an accident at their MSR where they turned off all reactor coolant pumps and the reactor shut itself down. Dr. Allen stated that in his experience with Ed Lyman (UCS author), he is a skeptic that doesn't always give credit for new designs.
    c. Mr. Sheehan asked if the US has the industrial base to support new reactor deployment. Dr. Allen conceded that this a current issue as the industry is overly reliant on foreign suppliers and this is complicated by US export controls. He believes that the industry and government will have to rebuild the supply chains as part of new deployments.
    d. Mr. Woolrich noted that science education, especially at high school and below has suffered and represents a barrier to understanding risks of nuclear. Dr. Allen noted that the students he talks with at the university are much more concerned with climate crisis than risks of nuclear. He also noted that University of California introduced a Nuclear Energy Boot Camp to teach nuclear technology

students about business with such topics as how to raise capital, finance and policy.

e. Mr. Woolrich asked if we have enough uranium to support new nuclear build. Dr. Allen responded that this is not an issue, but noted new advanced designs rely on a higher enrichment, up to 20% U-235. This is based on the standard tha <20% enrichment is not a proliferation risk. However, there are no current producers of this HALEU (High Assay Low Enriched Uranium), only downblends from defense programs. He believes that success fo these companies depends on our ability to make HALEU.
f. Mr. Woolrich asked what the security concerns would be for an SMR. Dr. Allen noted that they are about the same size as university test reactors that do not have emergency planning zones due to their reduced risks. He would expet similar controls – less than large LWR security forces. He noted some microreactor designs are claiming to be very mobile (truck transportable), but he thinks that is a social stretch to believe we would support that level of risk.
g. Mr. Woolrich asked about nuclear waste and what is the answer. Dr. Allen responded that some countries (Finland, Sweden) have solved this issues, there are siting processes that work better and we can safely store spent nuclear fuel until we develop a long term solution. He stated that he believes a consent based siting process is needed to get the US beyond opposition to Yucca Mountain.
h. Mr. Salonia noted that it would take an enormous number of windmills to meet our energy needs. Dr. Allen that 100% renewable would certainly be millions of windmills and that no one has yet built out renewables at scale. Mr. Semancik asked about hybrid nuclear with renewables. Dr. Allen responded that some companies such as Terrapower are proposing integrating their nuclear plants with renewables. In the case of Terrapower, they have designed an intermediate molten salt storage system that would be heated by the reactor and used to generate power when needed take advantage of wind and solar and mitigate the intermittence of those sources.
i. Mr. Semancik asked about transgenerational environmental justice – who gets the benefit and who takes the risks. Dr. Allen responded that climate change, not nuclear waste, is the biggest challenge to future generations who do not have a choice of what we do today.
j. Mr. Woolrich asked what Dr. Allen sees as the right amount of nuclear in the energy mix. Dr. Allen said he believes that we will see about 50% renewable and 20 to 40% nuclear. He also noted that he sees a trend of maximum local control of power that will be supported by SMR and microreactors.

5. **Public Comment.** There were no members of the public present.

6. **Adjournment**
   Motion was made by Mr. Sheehan and seconded by Mr. Sherrard to adjourn; no objections; unanimous vote in favor; meeting adjourned at 7:45 PM.

Dr. Todd Allen – Bio

Dr. Todd Allen is currently a faculty member and chair of the Nuclear Engineering & Radiological Sciences Department at the University of Michigan and a senior fellow at Third Way, a DC-based think tank, supporting their clean energy portfolio. He was the Deputy Director for Science and Technology at the Idaho National Laboratory from January 2013 through January 2016. Both the INL and Third Way positions occurred while on leave from the University of Wisconsin. Previously, he was a professor in the Engineering Physics Department at the University of Wisconsin, a position held from September 2003 through December 2018. In addition to his teaching and research responsibilities at Wisconsin, he was also the Scientific Director of the Advanced Test Reactor National Scientific User Facility, centered in Idaho Falls, Idaho, at the Idaho National Laboratory. He held that position from March 2008-December 2012. He was also the Director of the Center for Material Science of Nuclear Fuel, a Department of Energy-sponsored Energy Frontier Research Center. Prior to joining the faculty at the University of Wisconsin, he was a Nuclear Engineer at Argonne National Laboratory-West in Idaho Falls. His doctoral degree is in Nuclear Engineering from the University of Michigan (1997). Prior to graduate work, he was an officer in the United States Navy Nuclear Power Program.

21ST CENTURY NUCLEAR ENERGY

JUNE 2021, TODD ALLEN, PROFESSOR & SENIOR FELLOW

FASTEST PATH TO ZERO
UNIVERSITY OF MICHIGAN

WHAT DO WE WANT IN OUR FUTURE?

VS.

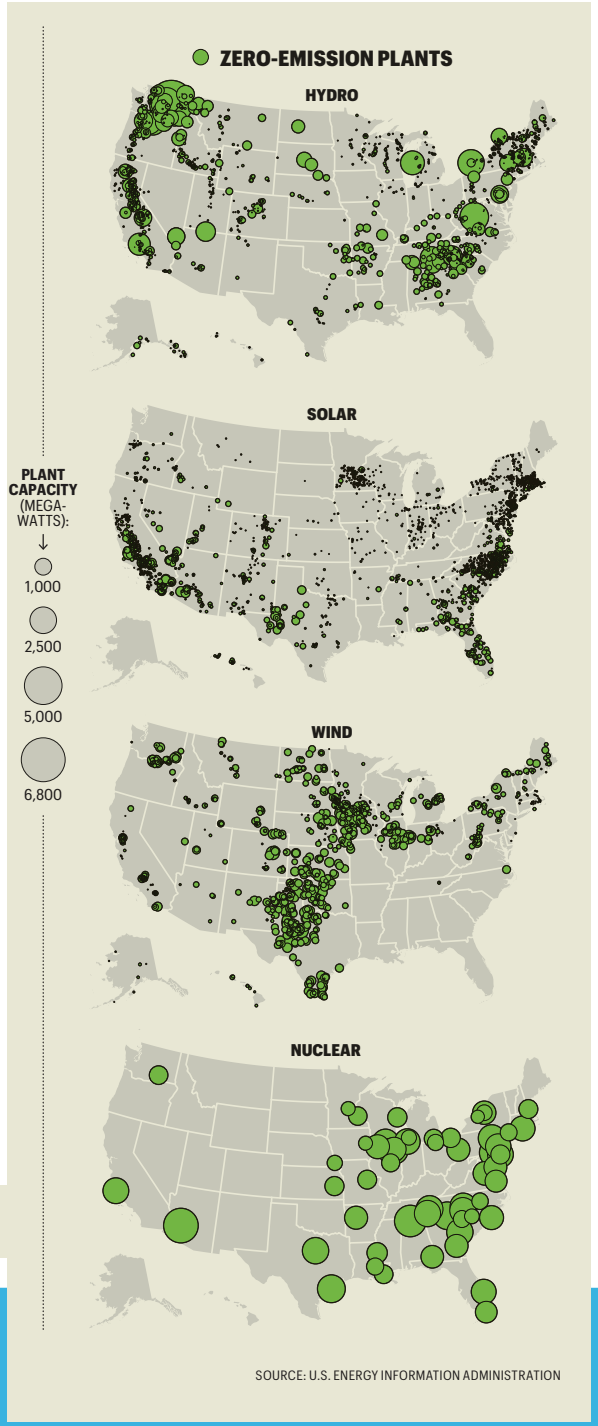
- Water purification
- Sanitation
- Irrigation
- Heating & air conditioning
- Vaccinations
- Pharmaceuticals
- Homes

- Clean
- Affordable
- Resilient
- Equitable

NUCLEAR ENERGY IS A BIG DEAL

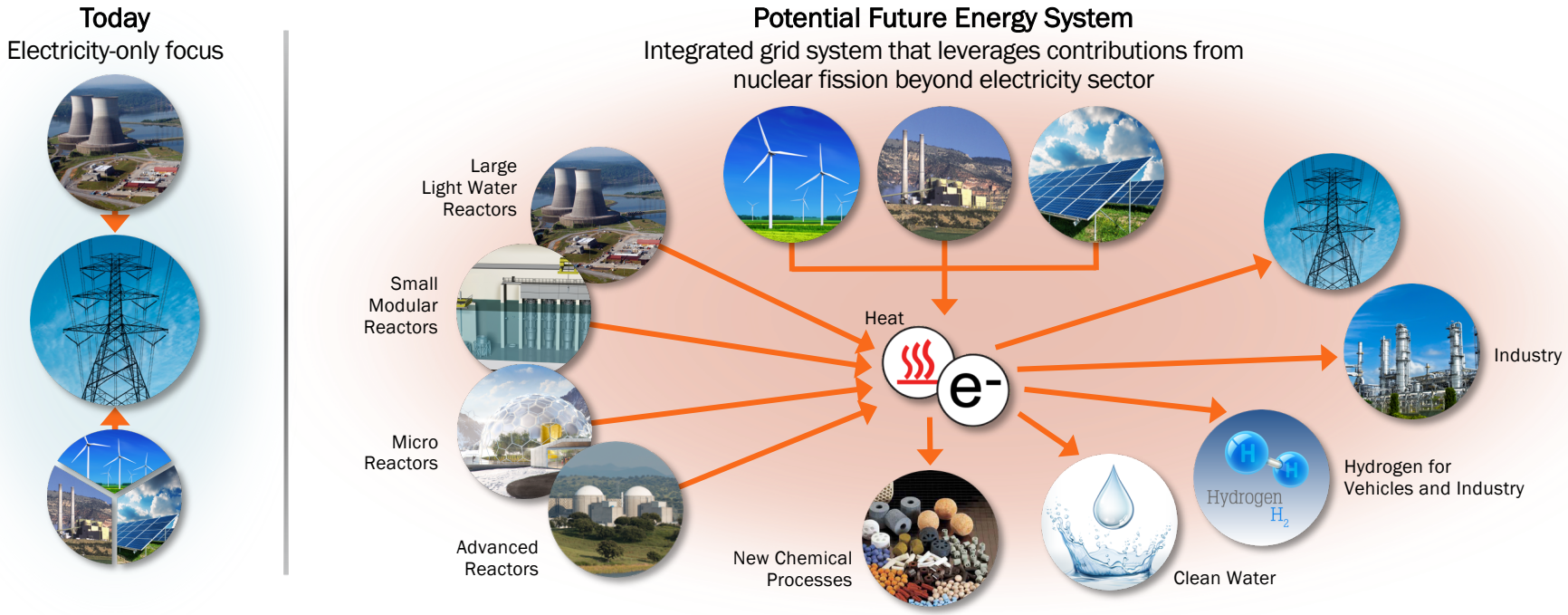
~20% of US electricity

~55% of the carbon-free electricity



ENERGY REIMAGINED

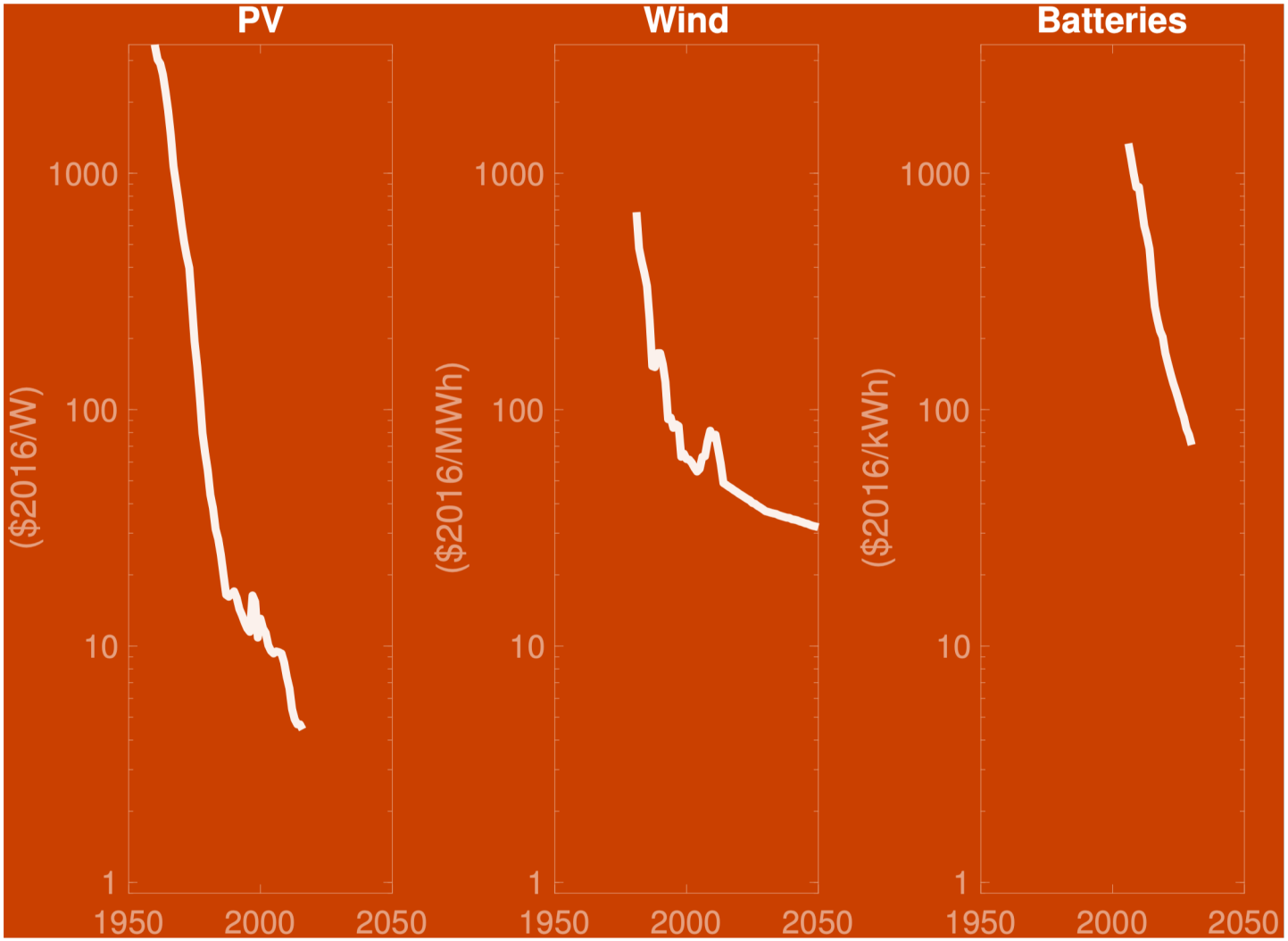
Maximizing energy utilization, generator profitability, and grid reliability and resilience through novel systems integration and process design



Flexible Generators ❖ Advanced Processes ❖ Revolutionary Design

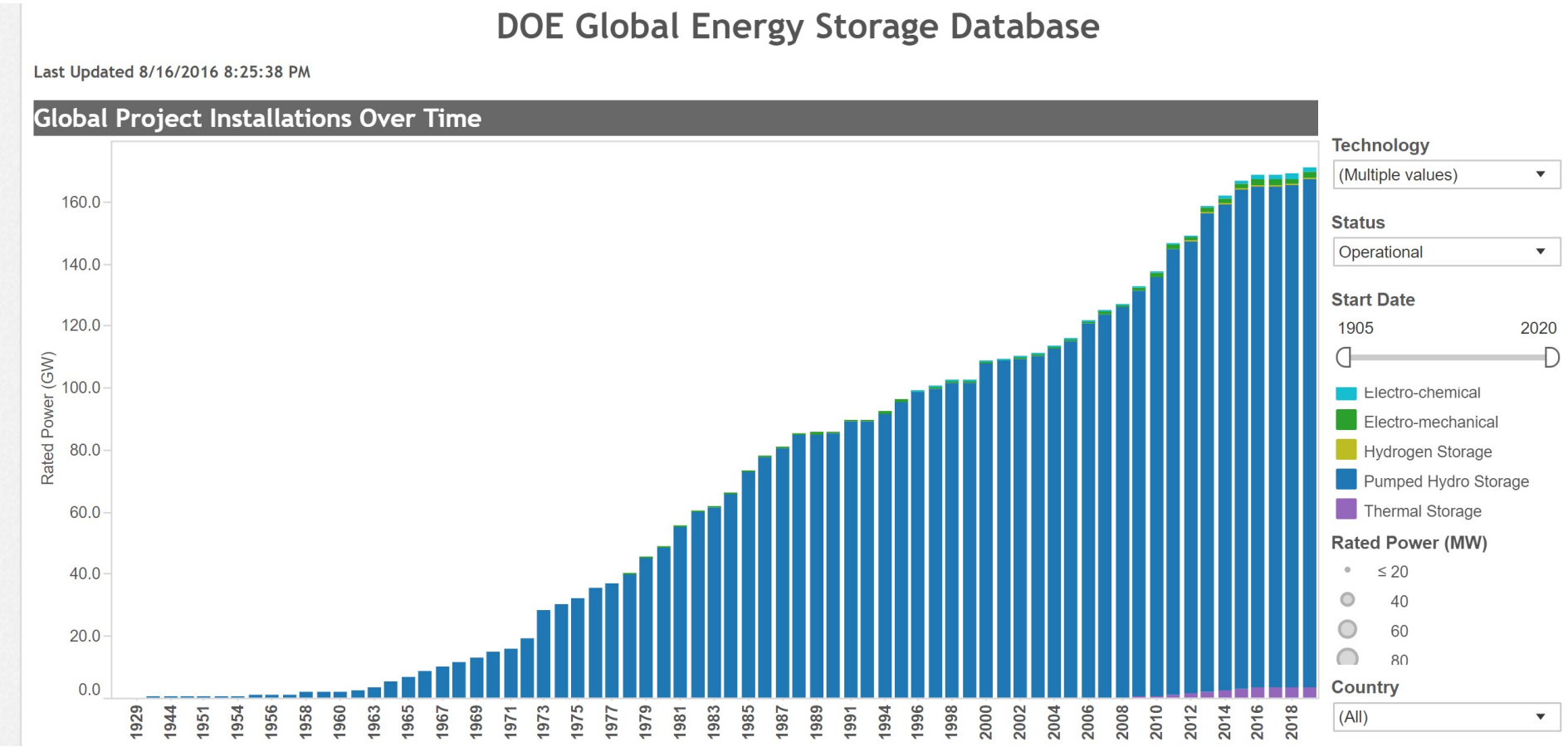
Courtesy Shannon Bragg-Sitton, Ph.D., Idaho National Laboratory

DROPPING PRICES FOR RENEWABLES



Courtesy Greg Nemet, Ph.D., University of Wisconsin

STORAGE

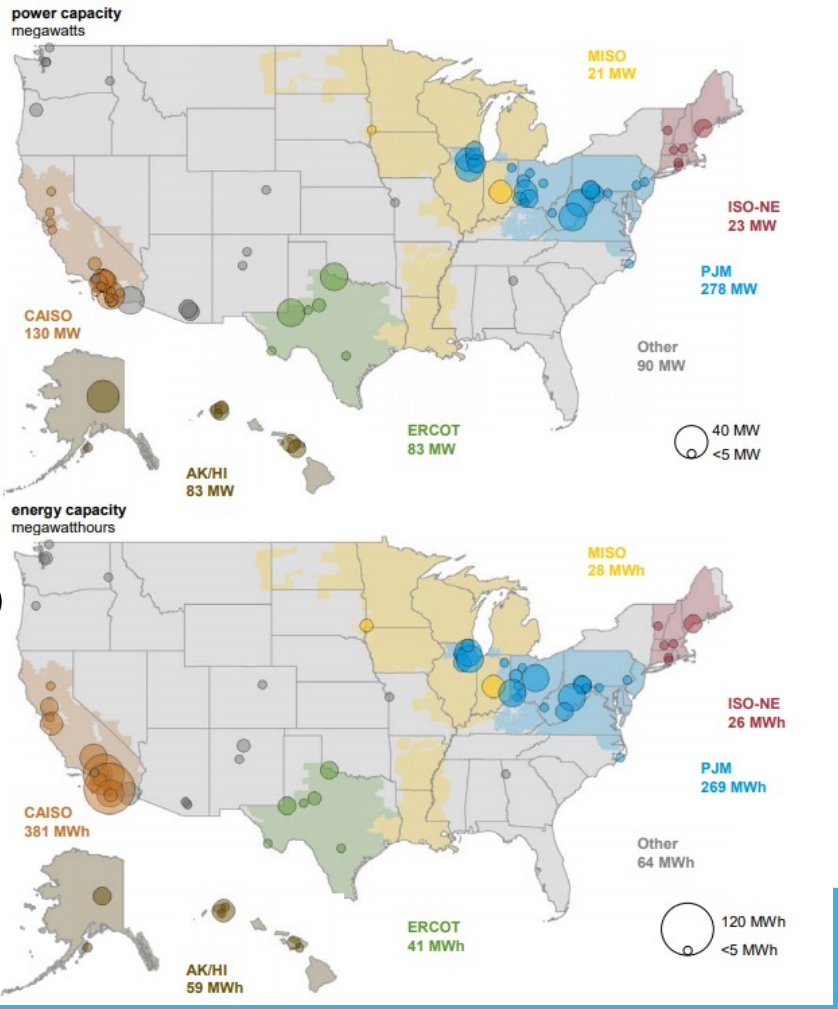


Source: DOE, 2018

NEW ENERGY STORAGE TECHNOLOGIES ARE BECOMING INCREASINGLY WIDESPREAD.

As of 2017, more than 700 MW of utility-scale batteries installed in United States

Some states now have battery mandates (CA, MA)



Sources: EIA (right), BNEF (top)

CONNECTED DEVICES

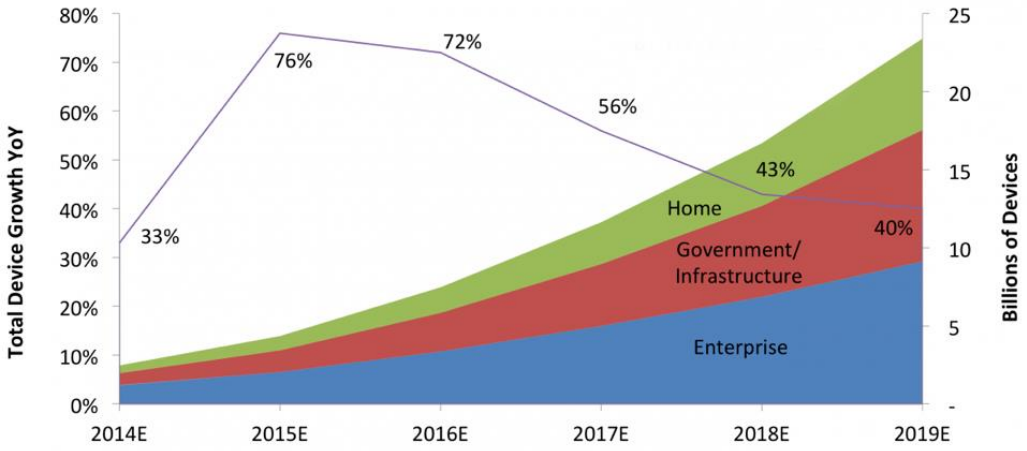
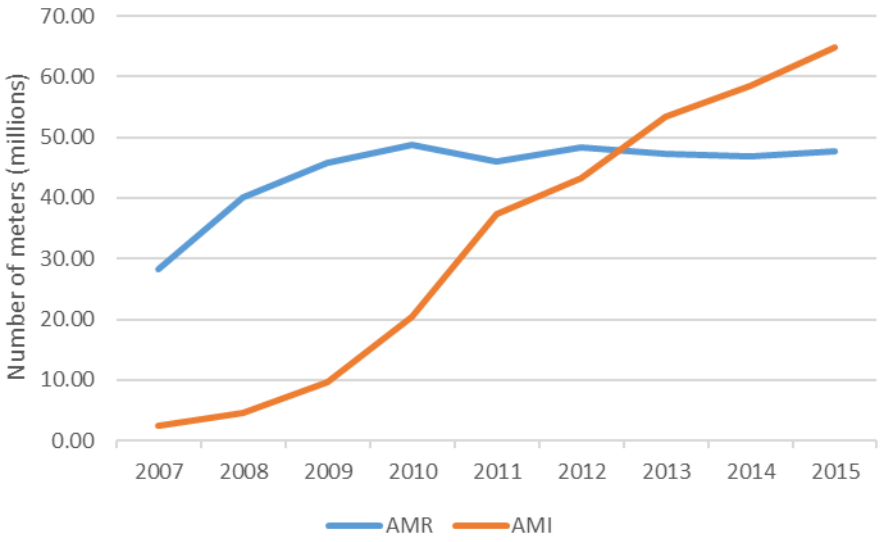


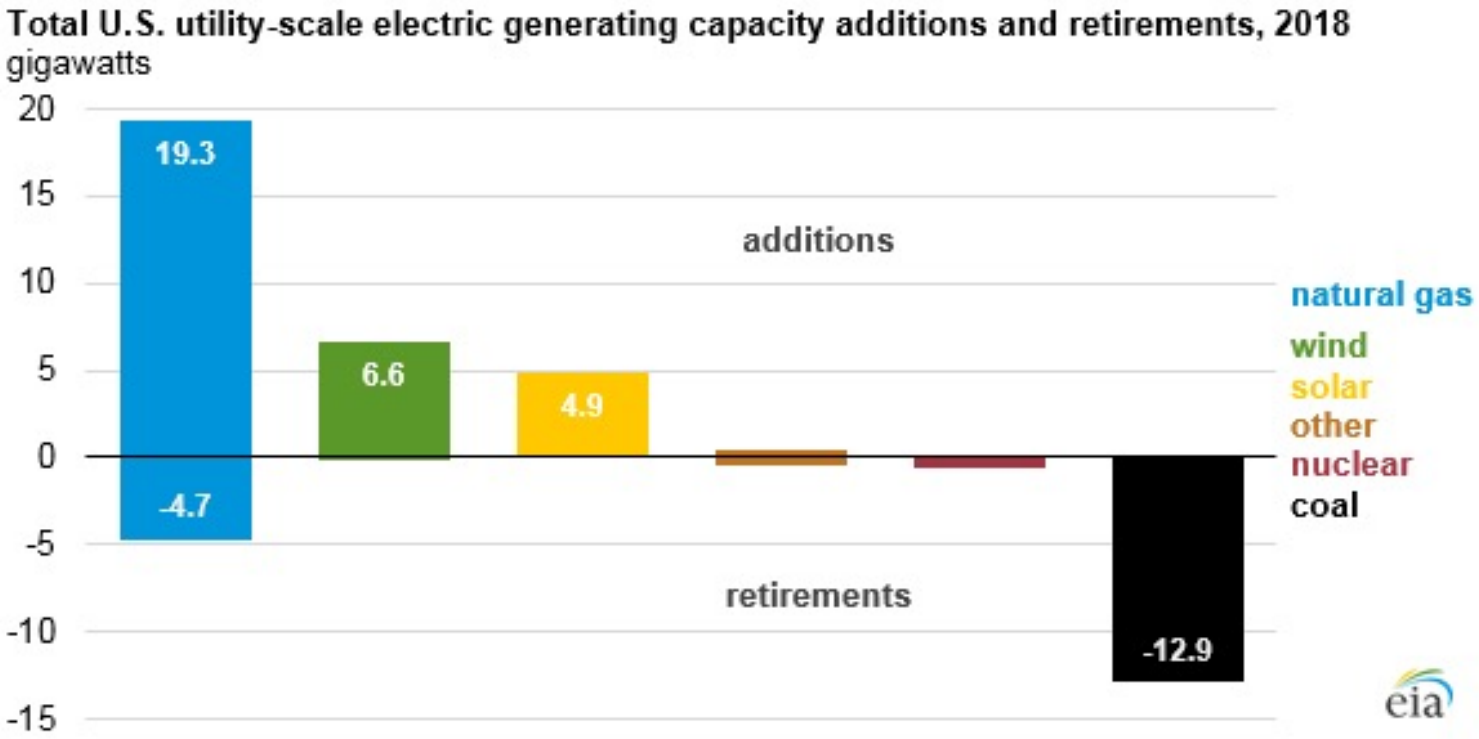
Figure ES1. Estimated number of installed IoT devices by sector. *Source:* Greenough 2014.

Rapid growth predicted for connected devices for energy efficiency

Smart meters surpass traditional one-way meters for home energy use monitoring

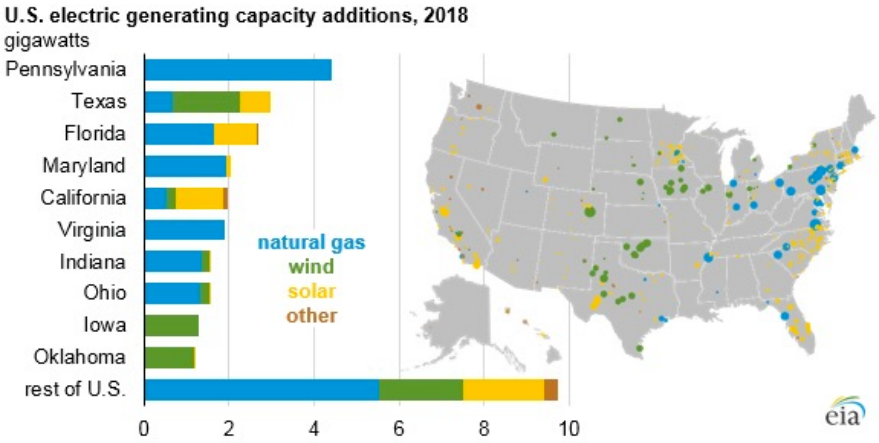


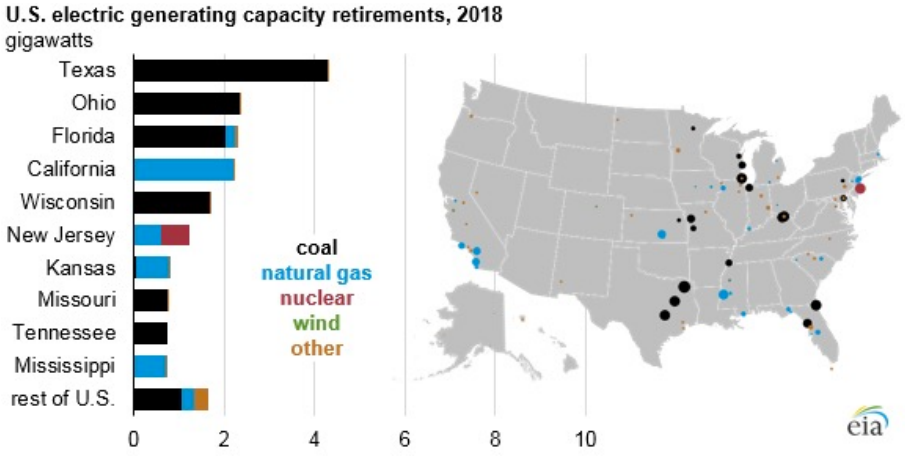
ENERGY ADDITIONS



Source: U.S. Energy Information Administration,
Preliminary Monthly Electric Generator Inventory
MARCH 11, 2019

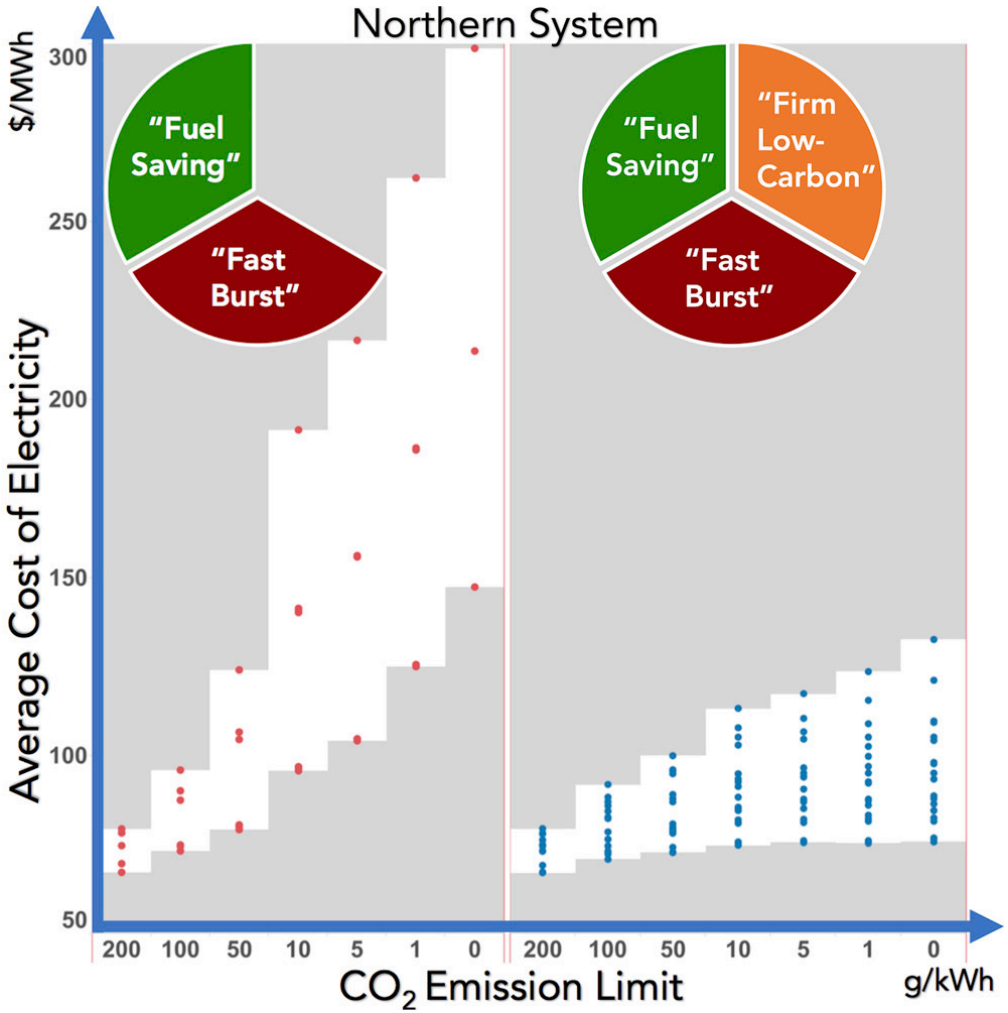
CHANGING ENERGY MIX





Source: U.S. Energy Information Administration,
Preliminary Monthly Electric Generator Inventory
MARCH 11, 2019

COST IMPERATIVE-SYSTEM MIX

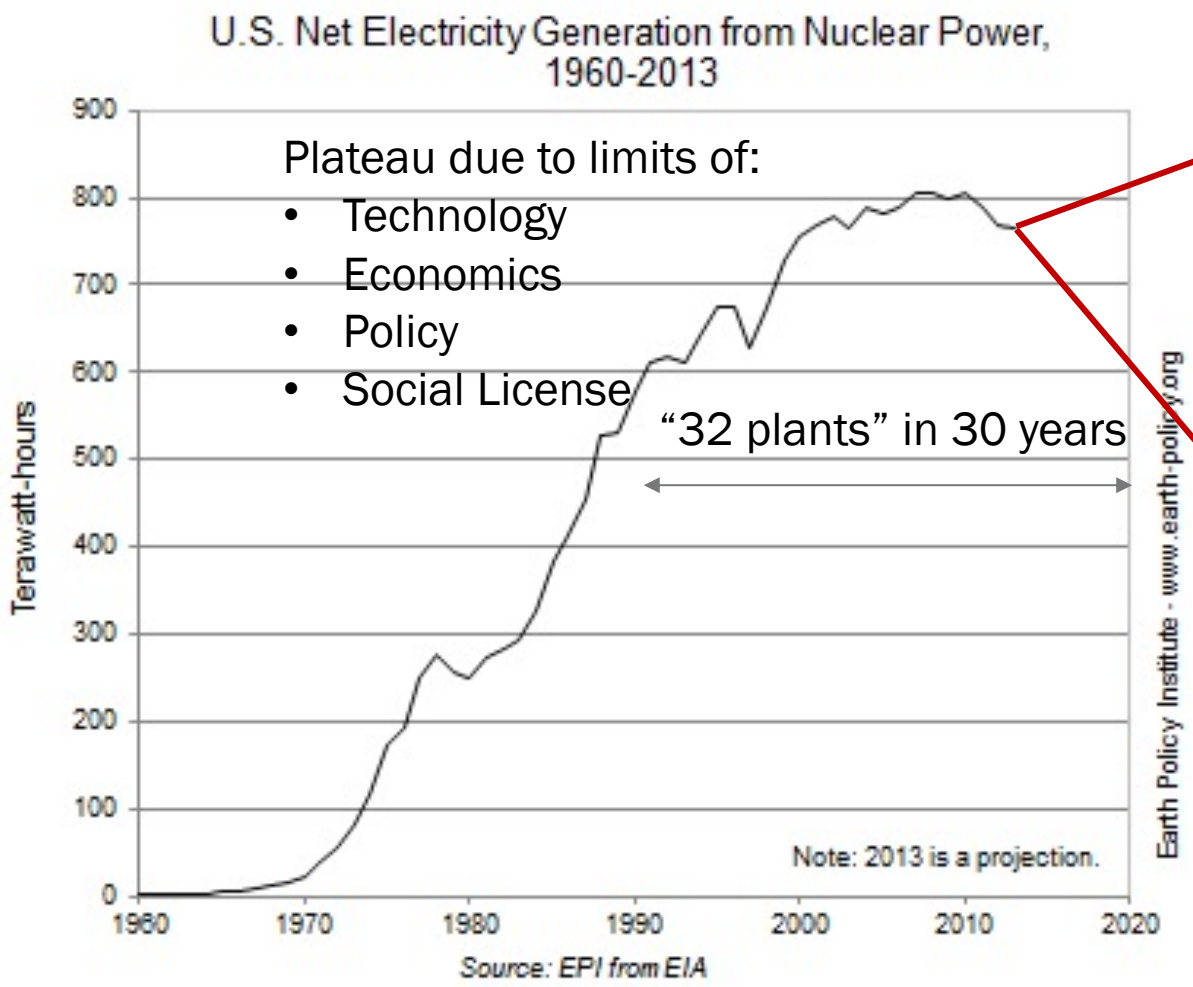


Models indicate that overall system cost is lower if a mix of zero carbon production sources are combined

Sepulveda et al. Joule 2018

WHAT DOES NUCLEAR TECHNOLOGY LOOK LIKE?

TRAJECTORY OF ATOMS FOR PEACE GENERATION



An "inflection?"

Due to a improved Technology, Policy Economics, and Social License approaches

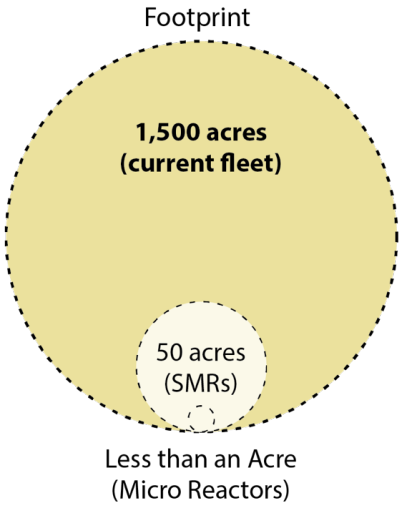
A "cliff?"

Since 2013, 6 reactors have retired prematurely (i.e., prior to license expiration) and 13 more are currently scheduled to retire prematurely

http://www.earth-policy.org/plan_b_updates/2013/update116

EXISTING NUCLEAR REACTORS

Number in operation:	**98 in U.S.**
Timeframe:	**Built in the 1950s-1980s**
Products:	**Electricity**
Megawatts:	**1,000+ megawatts**
Customers:	**Large utilities**
Emergency zone:	**10 miles**
Construction:	**Custom built on site**
Scalability:	**Difficult due to size and cost**



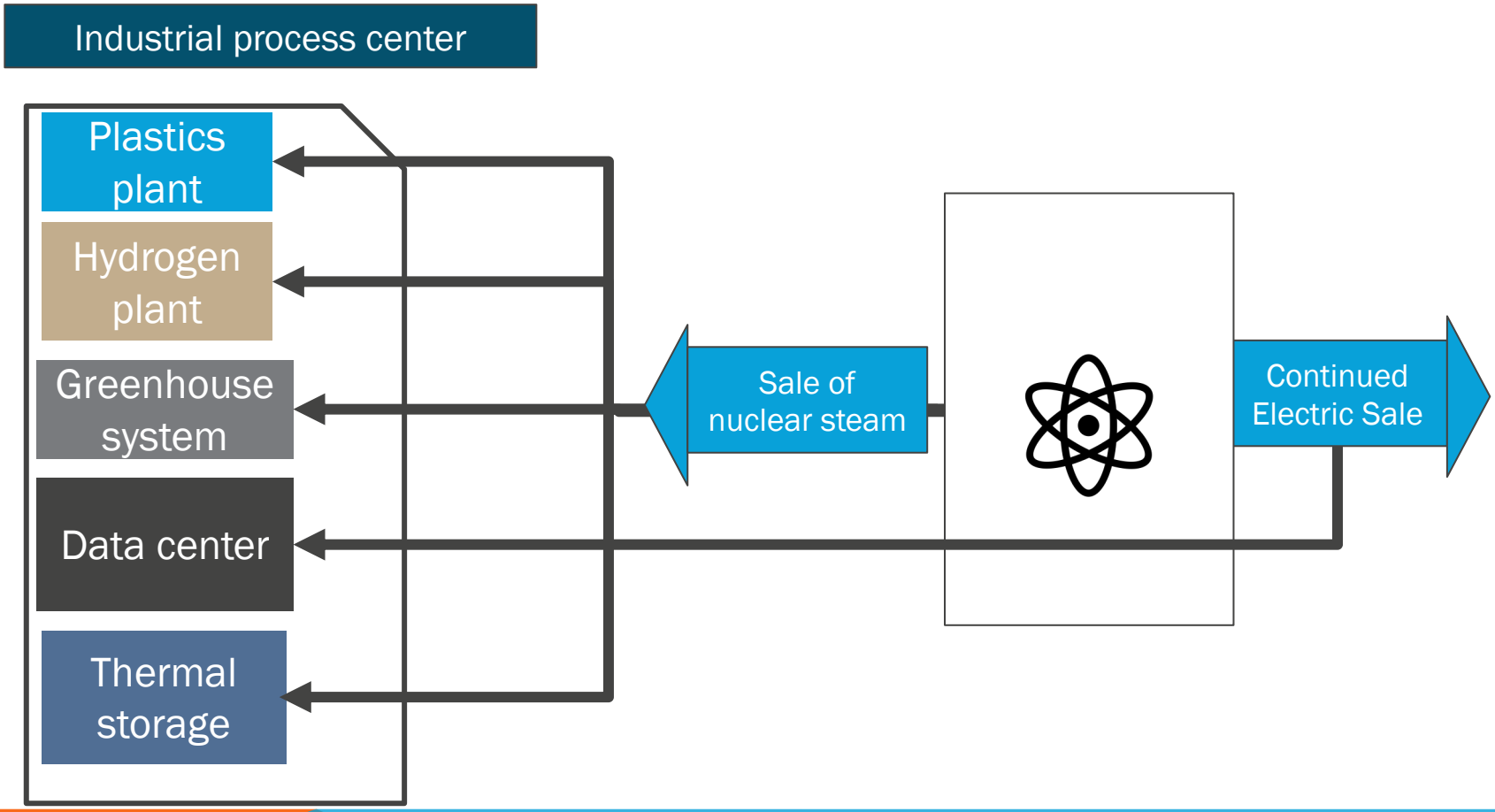
Applications:
Baseload electricity; 24/7

Did you know? In November 2018, the Union of Concerned Scientists recommended federal and state governments adopt policies to preserve the low-carbon electricity the current fleet of nuclear reactors provides.

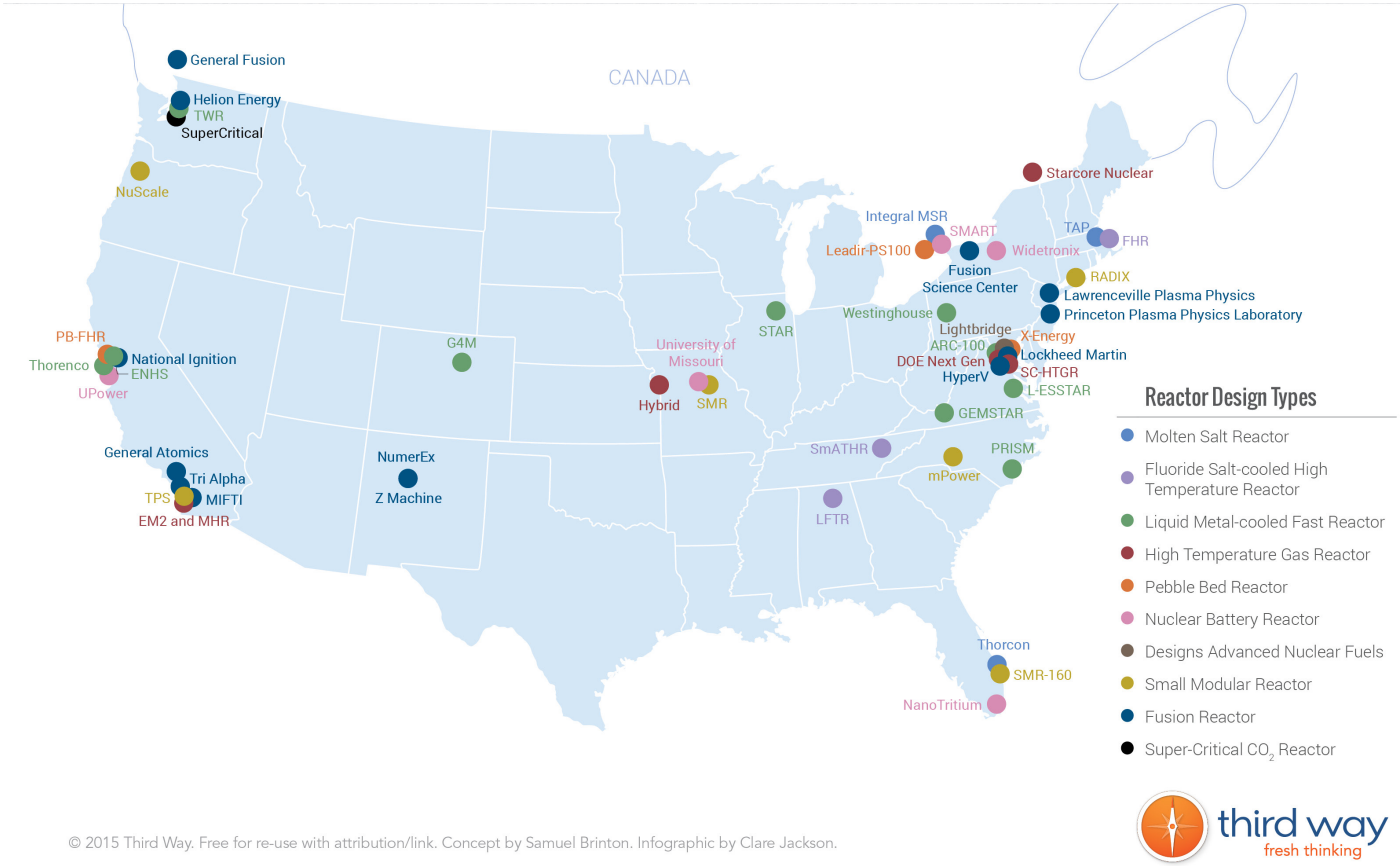
Courtesy Shannon Bragg-Sitton, Ph.D., Idaho National Laboratory

NUCLEAR REPURPOSING

Reconfigure one or more of Exelon's nuclear plants to sustainably enhance their long-term value, by producing new products – not just electricity; for example, by providing steam to industrial partners.



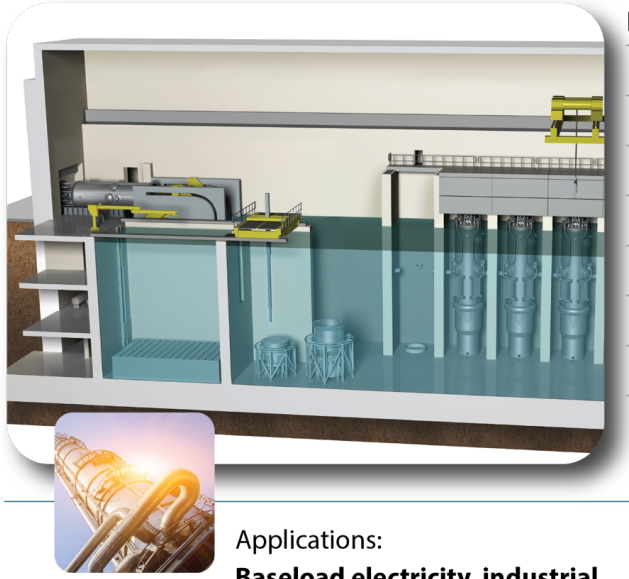
U.S. NUCLEAR



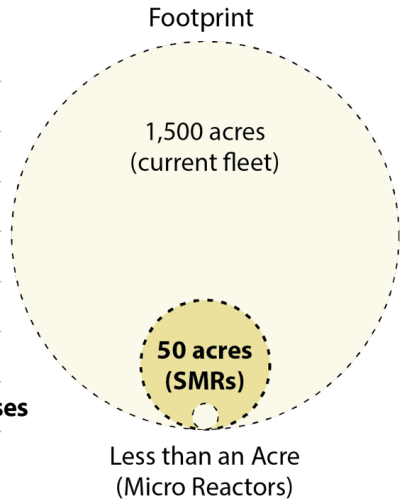
third way
fresh thinking

Advanced Reactor Companies

SMALL MODULAR REACTORS



Number in operation:	**None***
Timeframe:	**first reactors expected by 2024**
Products:	**Electricity, heat, and steam**
Megawatts:	**60-300 megawatts per module**
Customers:	**Large utilities; municipalities; industry**
Emergency zone:	**.19 miles**
Construction:	**Factory built; assembled on site**
Scalability:	**Reactor modules added as demand increases**



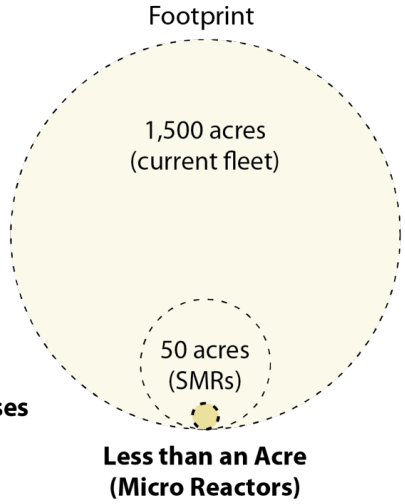
Applications:
Baseload electricity, industrial electricity, industrial processes such as hydrogen production

**First SMR in U.S. is currently going through regulatory approval and siting process; UAMPS proposing 12-module SMR in Idaho using NuScale technology.*

Courtesy Shannon Bragg-Sitton, Ph.D., Idaho National Laboratory

MICROREACTORS

Number in operation:	**None in the U.S.**
Timeframe:	**first reactors expected by 2025**
Products:	**Electricity, heat, and steam**
Megawatts:	**20 megawatts or less**
Customers:	**Military; municipalities; industry**
Emergency zone:	**less than .19 miles**
Construction:	**Factory built; assembled on site**
Scalability:	**Reactor modules added as demand increases**



Applications:
Power for remote locations, maritime shipping, military installations, mining, space missions, desalination, disaster relief

Sen. Lisa Murkowski, R-Alaska, April 14, 2019 Op-Ed in the Anchorage Daily News.

Improvements in nuclear technology "are enabling the emergence of so-called "microreactors" that could be a perfect fit throughout our state. As the name suggests, these smaller reactors can be right-sized for dozens of Alaska communities and will have off-grid capability that could solve the challenge of providing clean, affordable energy in our remote areas."

Courtesy Shannon Bragg-Sitton, Ph.D., Idaho National Laboratory

THE IMPERATIVES FOR NUCLEAR ENERGY

THE EMISSIONS REDUCTION IMPERATIVE

Supply chains + Add to myFT

Blue chips act to cut supply chain greenhouse gas emissions

Rolls-Royce, Nestlé and Panasonic among larger companies taking action

Michael Pooler JANUARY 29, 2018 2

npanies taking serious action to tackle greenhouse gas
y chains has doubled, according to research by an

luding Rolls-Royce, Nestlé and Panasonic were among
l with taking an "industry-leading" approach on the
profit that collected data on behalf of 99 of the world's
nisations.

THE WALL STREET JOURNAL.

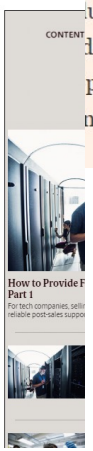
Home World U.S. Politics Economy Business Tech Markets Opinion Life & Arts Real Estate WSJ. Magazine

BUSINESS | LOGISTICS REPORT | WSJ LOGISTICS REPORT

Levi's Plans to Slash Emissions in Global Supply Chain by 2025

The apparel giant aims to reduce greenhouse gas emissions at a sprawling set of factories and mills in 39 countries, sta
suppliers

Levi's will start its effort to cut greenhouse gas emissions through energy-efficiency programs at factories run by vendors in the first tier of its supply chain, such as this supplier facility in Mexico. PHOTO: PHOTO COURTESY OF LEVI STRAUSS & CO.

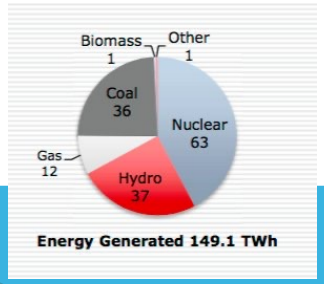


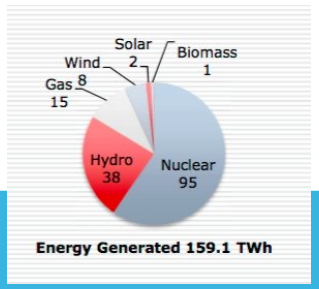
How to Provide F
Part 1

BRIEF

Asics plans to cut 55% of its supply chain carbon emissions

Ontario Transition from Coal





THE SUPPLY CHAIN IMPERATIVE

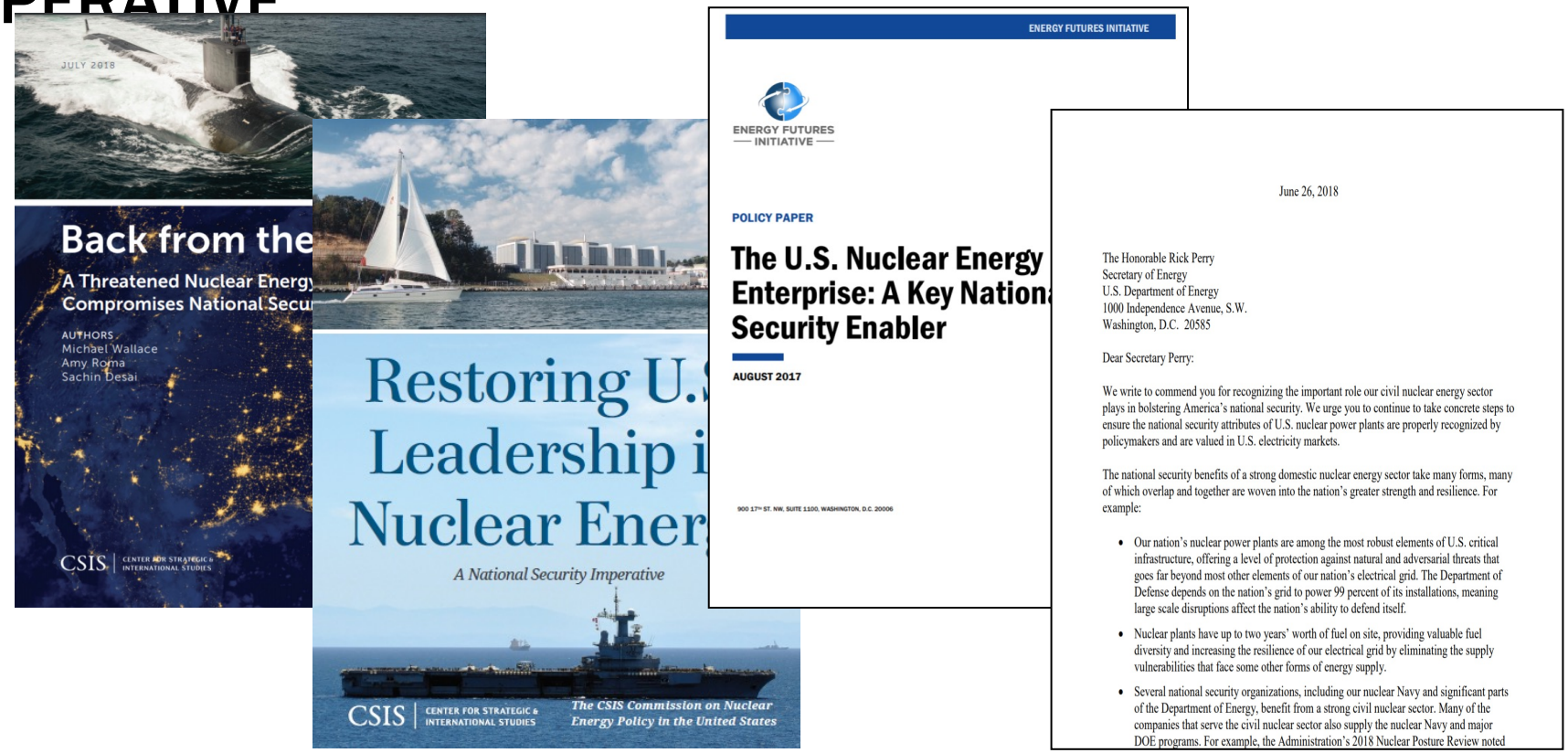
£1 trillion international new-build and decommissioning market over the next 10 years

The WNA estimates that the value of global investment in new reactor build will be of the order US$1.5 trillion (£0.93 trillion), with significant international procurement expected to be approximately US$530bn (£330bn), US$40bn (£25bn) per year through 2025.

> "We need to be clear where we own the value, understand our value proposition in nuclear and where the supply chain can improve competitiveness."
>
> **CEO, Manufacturing organisation**

Ernst & Young LLP, "Creating confident investors and competitive advantage for the UK nuclear supply chain" November 2017

THE NATIONAL & INTERNATIONAL SECURITY IMPERATIVE



PRAGUE (Reuters, 14 Nov 2018) - Czech Prime Minister Andrej Babis said on Wednesday geopolitics should be a factor when the NATO and EU member country decides future nuclear power investments as the country mulls whether to build new reactors.

CHINA

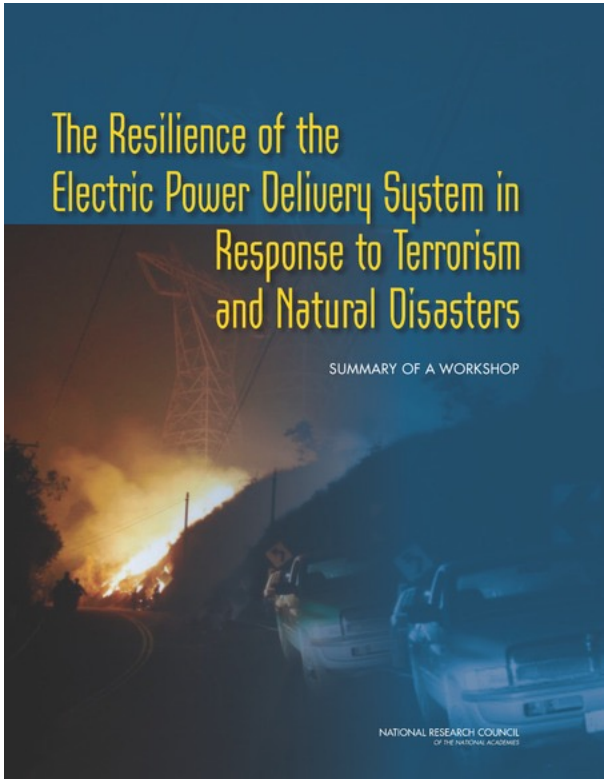
RUSSIA

NEARLY 2/3 OF ALL NUCLEAR POWER PLANTS UNDER CONSTRUCTION USE CHINESE OR RUSSIAN DESIGNS

Source: International Atomic Energy Agency: PRIS Database
Updated: March 2018

NEI

THE RESILIENCE IMPERATIVE



Houston, 22 December 2016 (Argus)-The North American Electric Reliability Corporation (NERC) wants to make sure utilities, power grid operators and federal and state policymakers understand the:

- Increased risk that reliance on a single fuel presents to dependable electric service.
- Firm transportation and dual-fuel capability may be needed to reduce widespread reliability problems.

A Call to Action:

A Canadian Roadmap for Small Modular Reactors

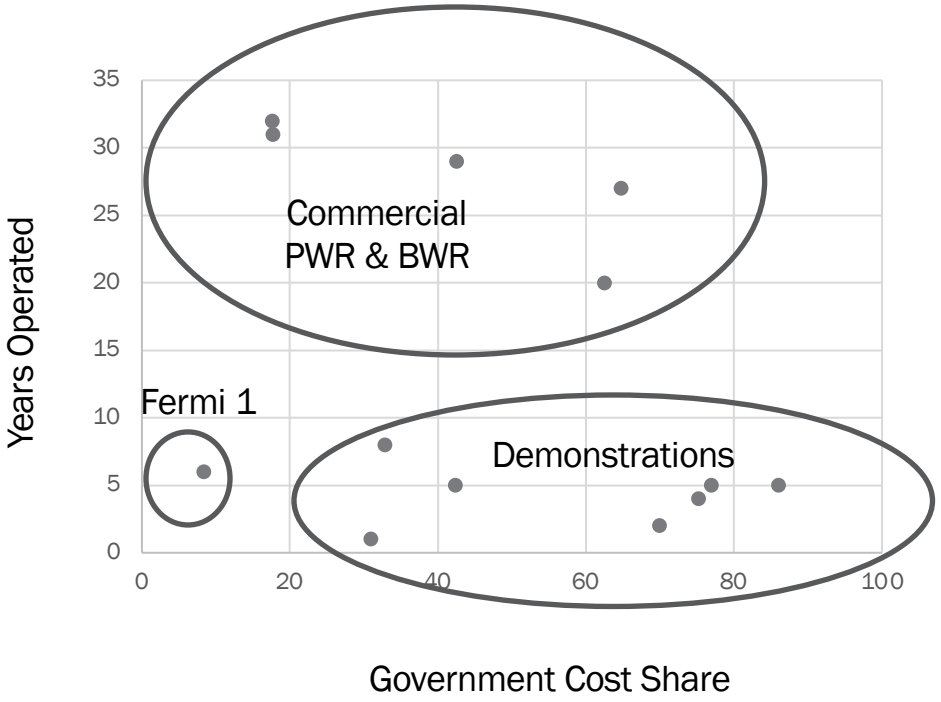
SUMMARY OF KEY FINDINGS

THE POLICY IMPLICATIONS

WHAT HAS WORKED

Table 1: Financial and Operation Summary Information for CPRDP-era Reactors [9]

Type	Reactor	Cost ($M)	Gov't Share (%)	MWe	Yrs Oper-ated
PWR	Ship-pingport	74	67.4%	60	27
PWR	Yankee Rowe	49.3	17.7%	134	31
PWR Average		61.7	42.5%	97	29
BWR	Elk River	11.4	86	22	5
BWR	Big Rock	27.8	17.6	75	32
BWR	BONUS	32.7	75.2	16.3	4
BWR	Path-finder	54	30.9	59	1
BWR	La Crosse	25	62.5	50	20
BWR Average		22.7	54.4%	44.5	12.4
Non-LWR	Fermi 1	88	8.3	80	6
Non-LWR	Hallam	68.4	69.9	40	2
Non-LWR	Piqua	16.9	76.9	11.4	5
Non-LWR	Peach Bottom	51.8	32.8	40	8
Non-LWR	CVTR	35.7	42.3	19	5
Non-LWR Avg.		52.6	46%	38.1	5.2
CPRDP Avg.		41.5	47.7%	59.9	15.5

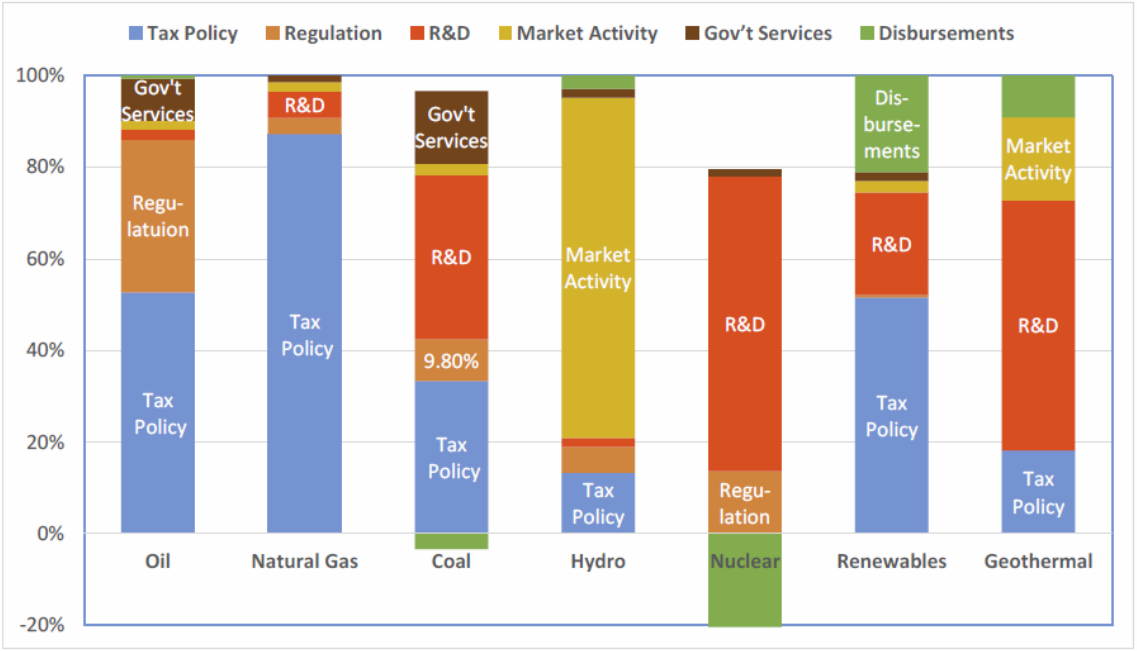


Steven Krahn[1] and Andrew Sowder[2]

Transactions of the American Nuclear Society, Vol. 117, Washington, D.C., October 29–November 2, 2017

POLICY INCENTIVES

Exhibit 4 – Mix of Federal Expenditures for Each Energy Source

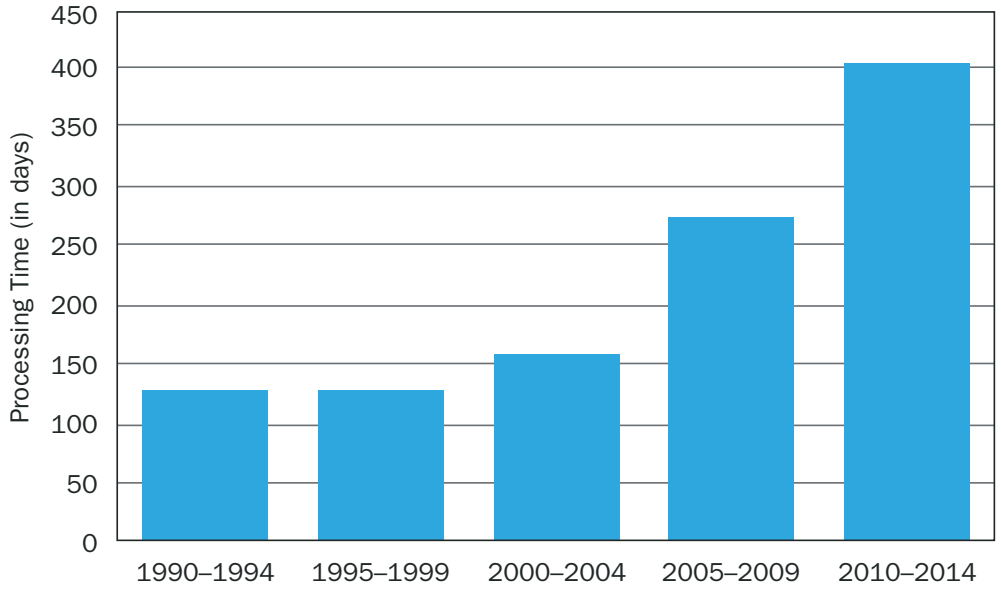


Expenditures for nuclear need better balance between R&D and tax policy

NUCLEAR EXPORT INCENTIVES

FIGURE 1

Average Processing Times for Specific Authorization Applications



Source: DOE reading room.

Nuclear Innovation Alliance, Enabling Nuclear Innovation Part 810 Reform

2015/2016 PIVOT

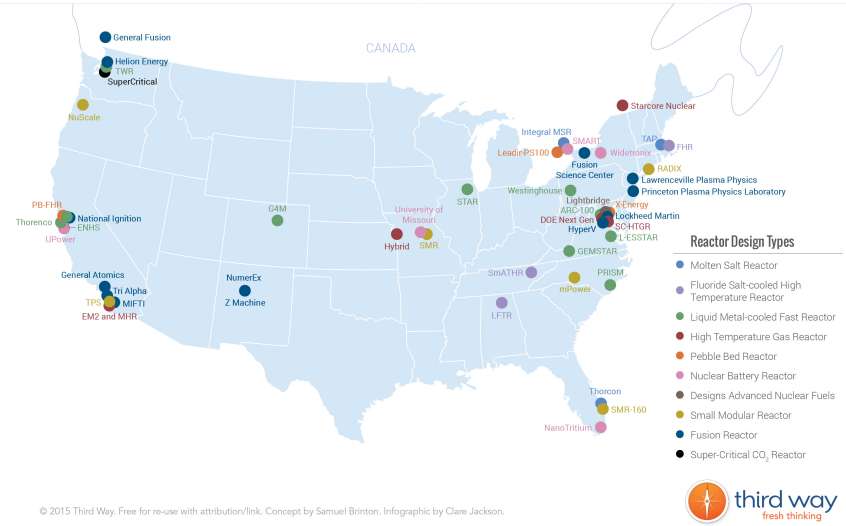
The 2015/2016 Pivot:

- GAIN
- NEIMA/NEICA
- Clean Energy Standards
- NRIC
- Nuclear Reimagined
- Advanced Reactor Companies
- NGOs (Third Way, CATF, BTI, Good Energy Collective, NIA, Global Nexus Initiative, Energy for Humanity)
- ARPA-E
- Nuclear Energy Bootcamp
- Fastest Path to Zero

Figure 3: Nuclear Plants Closing in Restructured States

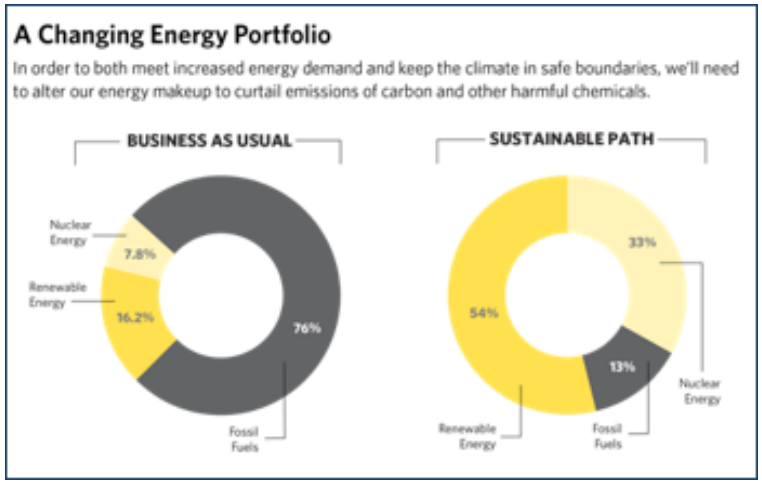
Source: Don Moul, President and CNO, First Energy Testimony to Nuclear Energy Caucus (4/17/18)

Advanced Reactor Companies



THE SOCIAL LICENSE IMPERATIVE

THE SOCIAL LICENSE IMPERATIVE



Source: The Nature Conservancy, The Science of Sustainability, 2018

Google

Moving toward 24x7 Carbon-Free Energy at Google Data Centers: Progress and Insights

Introduction

In recent years, Google has become the world's largest corporate buyer of renewable energy. In 2017 alone, we purchased more than seven billion kilowatt-hours of electricity (roughly as much as is used yearly by the state of Rhode Island[1]) from solar and wind farms that were built specifically for Google. This enabled us to match 100% of our annual electricity consumption through direct purchases of renewable energy; we are the first company of our size to do so.

Reaching our 100% renewable energy purchasing goal was an important milestone, and we will continue to increase our purchases of renewable energy as our operations grow. However, it is also just the beginning. It represents a head start toward achieving a much greater, longer-term challenge: **sourcing carbon-free energy for our operations on a 24x7 basis.**

Meeting this challenge requires sourcing enough carbon-free energy to match our electricity consumption *in all places, at all times*. Such an approach looks markedly different from the status quo, which, despite our large-scale procurement of renewables, still involves carbon-based power. Each Google facility is connected to its regional power grid just like any other electricity consumer; the power mix in each region usually includes some carbon-free resources (e.g. wind, solar, hydro, nuclear), but *also* carbon-based resources like coal, natural gas, and oil. Accordingly, we rely on those carbon-based resources — particularly when wind speeds or sunlight fade, and also in places where there is limited access to carbon-free energy. Carbon-free or not, around-the-clock electricity is the fuel that enables us to continuously deliver Google search results, YouTube video plays, Google Cloud Platform services, and much more without interruption.

OCTOBER 2018

The Nuclear Power Dilemma

Declining Profits, Plant Closures, and the Threat of Rising Carbon Emissions

Steve Clemmer
Jeremy Richardson
Sandra Sattler
Dave Lochbaum

November 2018

It's Time for Environmentalists and the Energy Industry to Work Together (Time Magazine, October 12, 2018)

MacArthur Foundation

Exelon

Union of Concerned Scientists

NICE Future
Nuclear Innovation: Clean Energy Future

THE DIVERSITY IMPERATIVE

The 2015/2016 Pivot:

- GAIN
- NEIMA/NEICA
- NRIC
- Nuclear Reimagined
- Advanced Reactor Companies
- NGOs (Third Way, CATF, BTI, Good Energy Collective, NIA, Global Nexus Initiative, Energy for Humanity)
- ARPA-E
- Nuclear Energy Bootcamp
- Fastest Path to Zero

FOR OUR OWN SUCCESS, BE DIVERSITY CHAMPIONS

ADVANCED NUCLEAR CAMPAIGN

Todd Allen

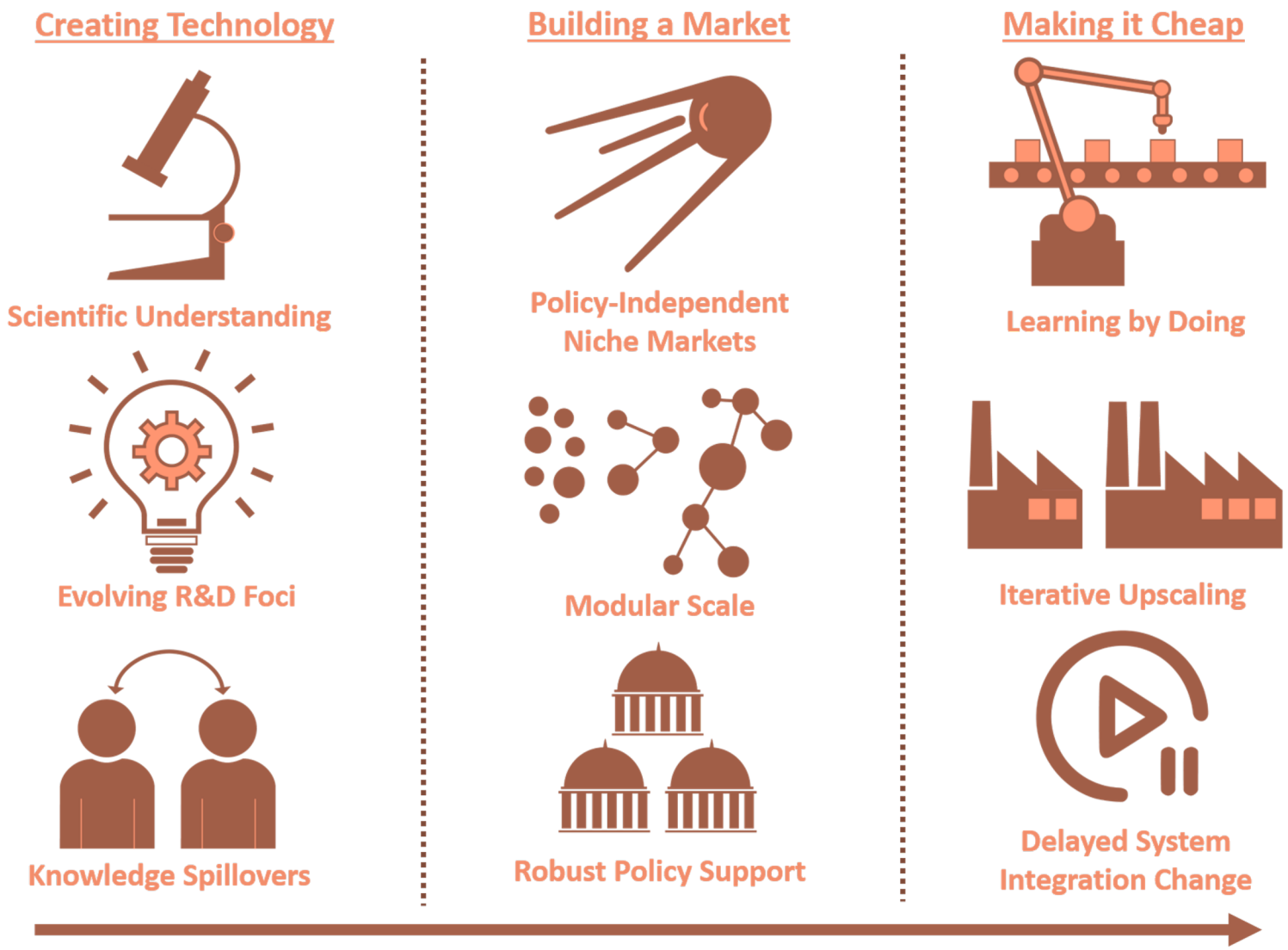
Senior Fellow, Third Way

tallen@thirdway.org

THEM: GIANT MUTANT ANTS (1950S)

A first entertainment use of radiation-induced mutant creatures

ACCELERATING THE PV MODEL



Source: Nemet (2019). *How Solar Became Cheap: A Model for Low-Carbon Innovation*, Routledge.

NUCLEAR ENERGY ADVISORY COUNCIL
September 15, 2021 6:30 PM
Virtual via MS Teams

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	Mr. James Sherrard
Mr. A Jordan	Mr. J. McGunnigle

1. **Call to Order of Meeting**
   NEAC Chair Rep. Ryan called the meeting to order at 6:34 PM on Teams.

2. **Approval of Minutes of the June 17, 2021 NEAC meeting.**
   A motion was made to approve the minutes by Mr. Sheehan and seconded by Mr. Jordan. Minutes were approved without any corrections or objections.

3. **Program - Presentation by Dominion Nuclear Energy Inc. Ms. Lori Armstrong, Director of Nuclear Safety and Licensing (DNSL) and Mr. Michael O'Connor, Plant Manager, supported by Mr. Ken Holt, Manager of Communications and Ms. Mary Nuara, State Policy Director** (presentation attached).
   a. Safety and COVID19 response
      i. Mr. O'Connor discussed station response to the COVID19 public health emergency (PHE) Pandemic response remains a focus for Dominion. Protocols as the station follow state, federal and corporate guidance.
         1. Mask requirements
         2. Social distancing where possible
         3. Site VP chairs a Pandemic Council that reviews best practices, latest requirements, and experiences at other parts of company.
      ii. Ms. Armstrong discussed Dominion testing capabilities and vaccination status.
         1. Millstone conducts extensive testing and has two test methods
            a. Saliva PCR lab test (contracted through Vault). Tests administered and proctored on site and sent away for lab analysis. Large number of kits are available on site.
               i. Tested Operators routinely before vaccinations. Tested entire site before and after Christmas in 2020.
            b. Abbott Bionex rapid (15 minute) antigen testing. Used for in-processing of temporary staff and contact tracing.
         2. Currently over 86% of Millstone Station personnel have been fully vaccinated.
      iii. Mr. Semancik asked what positivity rate Millstone was seeing and if it was the same as CT in general. Ms. Armstrong responded that they are seeing about the same rate of non-work transmission as the state in general, mostly among non-vaccinated and

those that had the J&J vaccine. There have been no positive cases since August 2021 including contractors.

iv. Mr. Jordan asked if Dominion was considering mandating vaccination. Mr. O'Connor stated that Dominion was re-evaluating the most current federal guidance. He also noted that Millstone has the highest rate of any Dominion facility.

v. Mr. O'Connor highlighted industrial safety performance at Millstone. The station has gone over 1470 days without an OSHA recordable injury. He attributed this success on providing workers adequate time to prepare for jobs. Dominion reinforced this by sending all station through a Dynamic Learning Activity that reinforces proper safety behaviors such as radiological safety and ladder and scaffolding safety.

b. Millstone Unit status - Mr. O'Connor discussed the power history curves for both Millstone Units 2 and 3. He discussed the following specific operational occurrences:

i. One Millstone Unit No. 2 power reduction due to storm conditions affecting the cooling water intake.

ii. Millstone Unit No. 3 manual turbine offline in December 2020 when several tubes failed in a fifth point feedwater heater on the non-nuclear side of the plant. Dominion had replaced two of the three last maintenance outage. This one had been previously replaced. However, due to erosion, several tubes failed. In order to repair the heater, Dominion had to come off line break vacuum in the main condenser. An additional replacement heater is being manufactured and will be installed in the spring 2022 scheduled maintenance/refueling outage.

iii. Millstone Unit No. 3 manual reactor shutdown to replace the shaft seal on the A Reactor Coolant Pump (RCP). During this 7.5 day outage, Dominion replaced the RCP seal and also replaced a main turbine bearing. After the plant was restarted, all RCP seals are performing fine. Engineers continue to monitor performance of all seals. Dominion is working with the seal vendor, Flowserve, on a new design and will install one new design on the A RCP in the April 2022 outage. The vendor is currently running the seal through 3000 to 4000 hours of testing.

1. Mr. Jordan asked if any other utility has installed the new seal design. Mr. O'Connor stated only Millstone and Turkey Point (FL) use this seal. Turkey Point was not ready to install the new design yet.
2. Mr. Jordan asked for more information on the main turbine bearing. Mr. O'Connor noted that one of the main turbine bearing's metal temperature was running hotter (140-150 F) than other bearings (120-135 F) during the previous startup. Engineers were concerned another turbine startup would be worse; so, decision as made to troubleshoot during the outage. Maintenance identified degradation in an oil flow channel such that oil was not evenly distributed. Mr. Jordan asked if this was a manufacturing defect. Mr. O'Connor stated they believed it was and seen this issue on another bearing associated with the Alterex.
3. Mr. Semancik asked to discuss how the outage was coordinated with the grid operator during peak season. Mr. O'Connor described how Dominion coordinated with Independent System Operator – New England (ISO-NE) to plan long term, medium term and short term outages. In this case, ISO-NE was concerned about impact of a natural gas pipeline outage and needed to

make sure Millstone was down less than 10 days. Millstone was able to be back online in 7.5 days in time to support grid availability for heat wave.

iv. Mr. Sherrard asked if Tropical Storm Henri. Mr. O'Connor stated that in consideration of potential fouling of the seawater cooling intakes and loss of power, Dominion reduced power of both Millstone Units No. 2 and No. 3 to 82% power and slowed main circulating water pump speed to reduce the debris loading at the intakes. Fortunately, winds turned away from the southwest and this improved conditions.

c. Millstone Staffing and Leadership Changes.
   i. Mr. Mike O'Connor was promoted to Plant Manager after he completed a temporary assignment as DNSL at North Anna Power Station (VA).
   ii. Mr. Guy Blackburn was promoted to Assistant Plant Manager.
   iii. Other management has been stable.
   iv. Station staffing
      1. Dominion has hired about 30 new staff this year. A typical year sees approximately 30-40 new staff.
      2. There are now over 450 station staff that are graduates from the Nuclear Technology Program at Three Rivers Community College. Dominion continues to have a strong partnership with the program.
      3. Past practice of hiring operators as Direct Senior Reactor Operators (SRO) candidates from the public has not been successful in getting them licensed. Recent experience is that the success is much hire when they start as non-licensed Plant Equipment Operators (PEOs).

d. 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 2021 YTD, the NRC has identified eight Green (very low safety significance) Non-cited Violations (NCVs) compared to six in 2020. All findings are in the Dominion corrective action system.
   i. Mr. Sheehan asked how long it takes to complete corrective actions for NCVs. Ms. Armstrong stated that it depends based on complexity. However, most are completed immediately before the NRC inspection report is issued when possible.

e. Ms. Armstrong reviewed recent COVID related licensing actions and exemptions as well as current license amendment requests pending with the NRC. All NRC correspondence related to license amendments is reviewed by the Council as noted in section 4.
   i. One pending licensing request is for a power uprate of Millstone Unit No. 3 based upon margin uncertainty recovery (MUR). Mr. Semancik asked the how much the requested power uprate was for. Mr. O'Connor stated it was approximately 1.6% or 18 MWe and 54 MWth.

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

g. Summary of Dominion's Internal Oversight assessment of performance and findings. Ms. Armstrong stated that corporate oversight was not currently tracking any issues of significance. Millstone management is focused on quickly resolving oversight concerns and

provided examples where they resolved issues with temporary storage in satellite facilities and records for Emergency Preparedness surveillances.

h. Ms. Armstrong stated there were no Environmental Impact events requiring reporting. The did experience intermittent power losses for some continuous environmental monitors. Engineering is working to improve the reliability of these monitors. Ms. Armstrong noted that actual airborne releases of radioactivity have been below projections and well below allowable limits. The amount of releases is posted on the Dominion website as required by state statute.

i. Dominion's assessment of Safety Culture. Ms. Armstrong noted there have been recent internal and external reviews of safety culture and all have determined the statio has high standards for safety culture.
    i. Mr. Semancik noted there were previous issues with contract security force safety culture and asked about the current status. Ms. Armstrong stated it was healthy based upon an assessment done by an outside company. Dominion ocntnues to pay attention to this area.
    ii. Mr. Sheehan asked how many allegations in 2020. Ms. Armstrong stated two allegations to outside agencies.

j. Mr. O'Connor provided additional information of the response of the Millstone units to recent storms Henri and Ida.
    i. Hurricane Henri made landfall near Millstone and the projection changed several times. Millstone station staffed extra personnel and identified available emergency response personnel if needed. He noted that with recent changes to the Emergency Preparedness updates to the Emergency Action Level (EAL) tables, the facility no longer bases emergency classification on wind conditions unless it results in actual equipment problems. Station procedures would direct shut down of the units if onsite winds exceed 65 mph. The maximum seen during Henri was 45 mph. Mr. Semancik noted that Dominion participation in the State Unified Command was helpful.
        1. Mr. Sheehan asked if Dominion had to staff their Emergency Operations Facility (EOF). Mr. O'Connor stated that they did not but did identify those staff that would be needed and ensured they were available to respond.
    ii. Tropical Storm Ida was primarily a rain event which by design affects Unit No. 2 more than Unit No. 3. Station procedures define a Localized Intense Precipitation (LIP) event as expecting more than 3 inches of rain in 6 hours. If an LIP is forecast, then plant operators close flood control boundaries and ensure drains are clear to prevent equipment damage. Plant procedures define sources for the weather forecasts.
        1. Ms. Armstrong noted that Unit No. 2 is designed to safely withstand a 9.4 inch per hour rainfall event. After Fukushima, Dominion is updating the licensing basis for LIP and other events to handle up to 11 inches rain per hour and 23.3 inches in six hours.

    iii. Emergency Preparedness and Response update was provided by Ms. Armstrong

1. Unusual Event declared on Nov. 8, 2020 due to seismic activity. Low level seismic activity was felt at the station ans operators properly classified the vent based on procedures. She noted that with the new EALs, this event would not have met emergency declaration thresholds. Operators and engineers inspected systems and no damage was detected. Unit No. 2 remained at 100% power and Unit. No. 3 was already shutdown for scheduled maintenance and refueling. She stated they noted some areas for improvement in the termination of emergency events and are working with state on those protocols.
2. Dominion has transitioned to Everbridge for emergency notifications. This is the same system used by state and is easier for local officials.
3. 2020 Graded Exercise was completed satisfactorily. NRC has positive comments DEEP coordination and practice with smaller drills.
4. Ms. Armstrong noted that other Dominion sites outside CT are experiencing siren problems. Corporate will be upgrading to use of Integrated Public Alert & Warning System (IPAWS) consistent with recent Federal Emergency Management Agency (FEMA) guidance.

k. Mr. O'Connor provided an update on other Topics requested by the Council
   i. Millstone Unit No. 2 Refueling Outage – Dominion will be
      1. inspecting the main generator rotor in order to support replacement in 2024
      2. replacing fourth point feedwater heaters
      3. replacing battery chargers due to obsolescence
      4. conducting planned RCP motor replacement
   ii. Millstone Unit No. 3 RCP seal performance
      1. Currently Millstone is replacing the A and D seals every scheduled outage and the B and C seals every other scheduled outage.
      2. Mr. Semancik asked if they understood why performance was difference between the A/D and B/C seals. Mr. O'Connor said they do not yet have a good explanation. The are exploring differences in piping runs and directions of rotation.
      3. Mr. Jordan asked if Turkey Point has seen similar differences. Mr. O'Connor stated that Turkey Point has a different three loop configuration.
   iii. Millstone Unit No. 3 Turbine Control Issues. Operators has been experiencing unusual alarms. Part of the response was to shift to Standby Load Control (SLC) which has been sued before (used to stop the progression of the blackout in 2004). During troubleshooting, maintenance needed to inspect an electronic control card. As maintenance personnel slid the card in, they experienced an unexpected transient change in power likely due to electronic noise. The troubleshooting had been reviewed and concurred with by the vendor as well as a Dominion fleet challenge. The next step was to remove the test equipment. When this was removed operators noticed that the #1 control valve fully closed then re-opened. With this information, engineers determined that when in SLC, one of four relays did not work. During the planned outage the relay was replaced and re-tested satisfactorily.

iv. Emergency Diesel Generator (EDG) performance – Dominion is focused on improving EDG performance at both Unit No. 2 and Unit No. 3 and increasing the availability of the EDGs. An NRC finding identified that the fuel oil overflow system at Unit. No. 2 was not safety related and design could not credit the recovered fuel oil from the injectors in meeting station requirements. Dominion engineers designed a fix and have implemented the change.
    1. Mr. Semancik asked what industry quartile Millstone was in for EDG performance. Mr. O'Connor stated they were currently in the second quartile. Mr. Jordan asked what their projection was to achieve first quartile performance. Ms. Armstrong stated the current plan was to achieve first quartile in 1Q23. Mr. O'Connor noted it was based on balancing EDG work during outages with the shutdown risk impacts.

v. Unit Life Cycle Management – Millstone Unit is currently in the period of extended operations and is licensed to operate until 2035 (60 year operating license). Millstone Unit No. 3 enters its period of extended operations in 2025 and is licensed to operate until 2045 (60 year operating license). Subsequent license renewal to 80 years has already been approved at Dominion's Surry Station (VA) and pending for North Anna Station (VA). Dominion expects that Dominion can entertain doing the work for subsequent license renewal in 2025. Dominion is replacing the main generator at Millstone Unit No 3 in 2022 and planning the replacement of the main generator at Millstone Unit No. 2. This is required to support any further license renewal.
    1. Mr. Semancik asked what additional work was required at Surry and North Anna to support an 80 year operating license. Mr. O'Connor stated there were no major changes required, but that Dominion took the opportunity to improve station operations by replacing main condensers, conducting a new environmental site review and implementing digital controls.
    2. Mr. Sheehan asked if Dominion would need to look inside the reactor vessel thermal shield for potential embrittlement. Mr. O'Connor responded that reactor vessel is already periodically inspected for embrittlement including removal of the core barrel. Dominion also withdraws metal test coupons stored in the reactor vessel for periodic destructive evaluation.

4. NRC Correspondence Reviewed since past meeting.

The list of NRC Correspondence was reviewed. One comment from NEAC was related to NRC environmental qualification inspection.

a. Millstone Power Station, Units 2 and 3 – Integrated Inspection Report 05000336/2021001 AND 05000423/2021001 dated April 29, 2021.
b. Millstone Power Station, Unit 3 – Requalification Program Inspection dated June 21, 2021.
c. Millstone Power Station, Units 2 and 3 – Emergency Preparedness Biennial Exercise Inspection Report 05000336/2021501 AND 05000423/2021501 dated June 23, 2021.
d. Millstone Power Station, Unit 1 – Safe Storage Inspection Report 05000245/2021001 dated July 26, 2021.

e. Millstone Power Station, Unit No. 2 - Relief Request for Limited Coverage Examinations Performed in the Fourth 10-Year Inservice Inspection Interval (EPID L-2020-LLR-0130) dated August 2, 2021.
f. Millstone Power Station, Units 2 and 3 – Integrated Inspection Report 05000336/2021002 And 05000423/2021002 and Independent Spent Fuel Storage Installation Inspection Report 07200047/2021002 dated August 9, 2021.

5. **Other material reviewed**

NEAC reviewed the following information:

a. NEAC nomination letter from Speaker Ritter to John McGunnigle dated June 23, 2021.
    i. Mr. McGunnigle introduced himself to the Council.

6. Public Comment

a. No members of the public were in attendance. There were no questions from the public.

7. **Adjournment**

Motion was made by Mr. Sheehan and seconded by Mr. Sherrard to adjourn; no objections; unanimous vote in favor; meeting adjourned at 7:41 PM.

Sec. 16-11a. Nuclear Energy Advisory Council; composition; duties. (a) There is established a Nuclear Energy Advisory Council which shall (1) hold regular public meetings for the purpose of discussing issues relating to the safety and operation of the nuclear power generating facilities located in this state and to advise the Governor, the General Assembly and municipalities within a five-mile radius of any nuclear power generating facility in this state of such issues, (2) work in conjunction with agencies of the federal, state and local governments and with any electric company operating a nuclear power generating facility to ensure the public health and safety, (3) discuss proposed changes in or problems arising from the operation of a nuclear power generating facility, (4) communicate with any electric company operating a nuclear power generating facility about safety or operational concerns at the facility, which communications may include, but not be limited to, receipt of written reports and presentations to the council, and (5) review the current status of facilities with the Nuclear Regulatory Commission.

Dominion's presentation should focus on the safety and operation of the facility referenced in the statute by discussing the following items over the period since the last NEAC presentation:

- Issues relating to the safety and operation of the nuclear power generating facilities
    - NRC Findings – based upon the number of findings
    - NRC performance indicators (PIs) and Dominion response to any non-green PIs
    - Summary of Dominion's Internal Oversight assessment of performance and findings
    - Dominion's assessment of Safety Culture
    - Radioactive Effluents Report summary/trend (PA 08-20) – liquid and gaseous
        - Discuss any unplanned releases – consequence and corrective actions
    - Key issues
        - COVID Response and impacts
            - NRC exemptions requested
        - Plant response/performance during Henri and Ida
- Discuss proposed changes in or problems arising from the operation of a nuclear power generating facility
    - Significant license changes
        - U3 Uprate – Margin Uncertainty Recovery (MUR) License Amendment Request (LAR)
        - Plans for life extension to 80 years
    - Offsite Emergency Plan
        - Significant changes
        - Declared emergency events
            - UE Seismic Event – November 2020
        - Graded Exercise
    - Significant Management/Work force changes
    - Plant Specific Issues
        - Update on EDG performance issues
        - U3 Main Turbine Control System transients during speed sensor troubleshooting
        - U3 RCP Seal performance update
    - Other environmental impacts
        - Any NPDES permit exceedences trend and summary

Millstone Power Station NEAC Presentation

Wednesday, 9/15/21

Dominion Energy®

Safety

- Safety is our first priority
- Commitment to protect the health and safety of the public

Coronavirus Response

- Mask requirements
- Social distancing
- Testing capability
- Vaccines encouraged
  - ~86% vaccinated
- Guidance as it evolves

Dominion Energy

Millstone Current Status

Millstone Unit 2

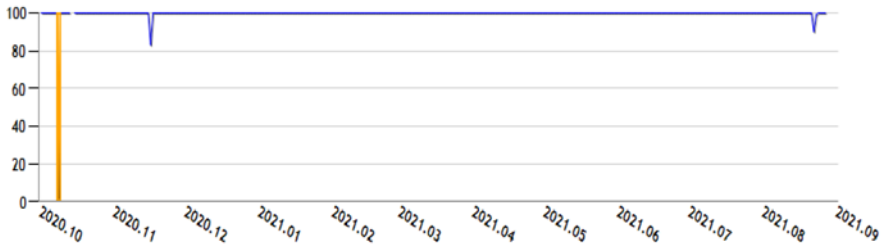
- 468 days online
- 100% capacity factor YTD

Millstone Unit 3

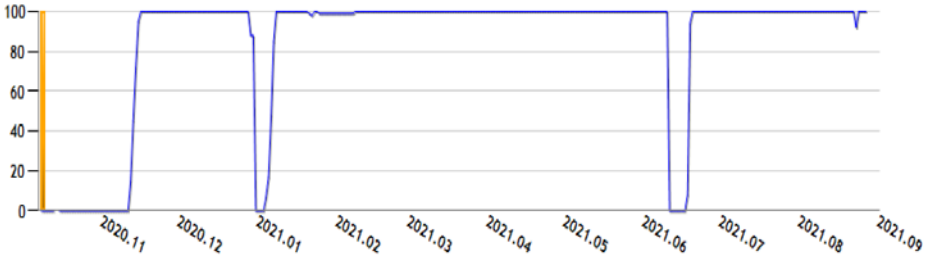
- 90 days online
- 94.76% capacity factor YTD

Operations History

Unit 2

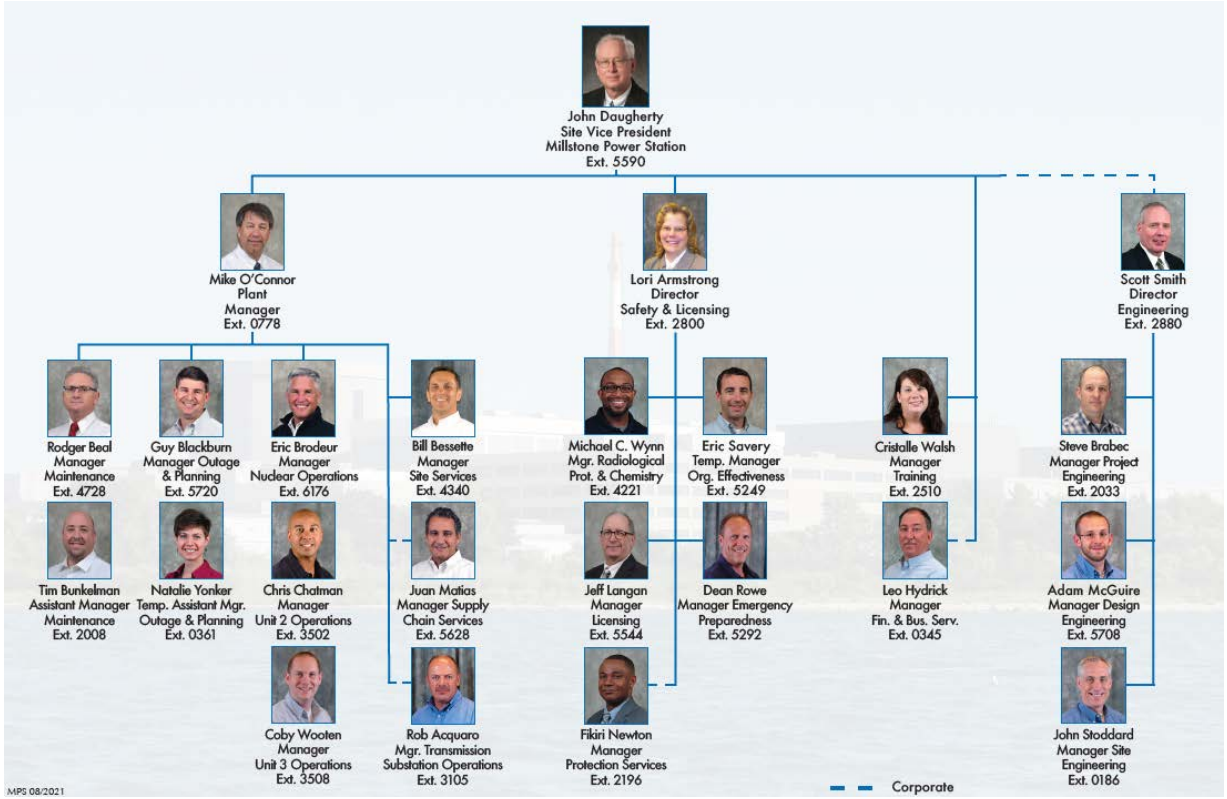


Unit 3



Dominion Energy

MPS Leadership Team



- Staffing levels
- Hiring effort
- Operations pipeline

Dominion Energy

NRC Findings

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

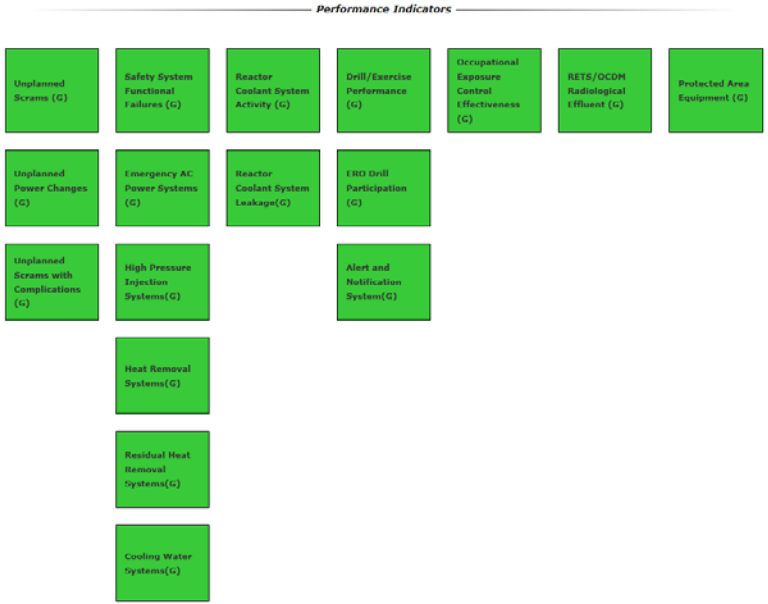
License Amendment Requests

- **Significant License Amendment Requests Approved by the NRC**
  - Exemption for security force on force exercise (2020)
  - Millstone Unit 3 – one time deferral of fall 2020 steam generator tube inspections (Sept 2020)
  - Millstone Unit 2 alternative request to extend steam generator weld examination intervals from 10 years to 30 years (July 2021)
  - Millstone Unit 2 steam generator inspection frequency technical specification revision (Sept 2021)

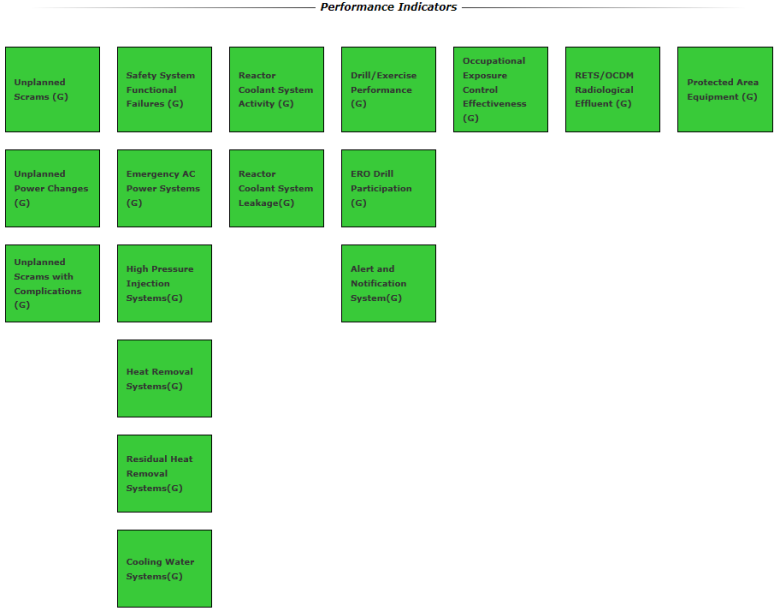
License Amendment Requests

- **Significant License Amendment Requests Approved by the NRC**
  - Millstone Unit 3 measurement uncertainty recapture power uprate
  - Millstone Unit 3 technical specification changes to clarify shutdown bank requirements and add alternate control rod position monitoring
  - Millstone Unit 3 technical specification changes – based on Westinghouse topical reports
    - – core operating limits report for large break loss of coolant accident analysis
    - – peak fuel centerline melt temperature safety limits

Millstone NRC Performance Indicators



Unit 2 Second Quarter 2021 NRC Performance Indicators



Unit 3 Second Quarter 2021 NRC Performance Indicators

Dominion Energy

Millstone Oversight Summary

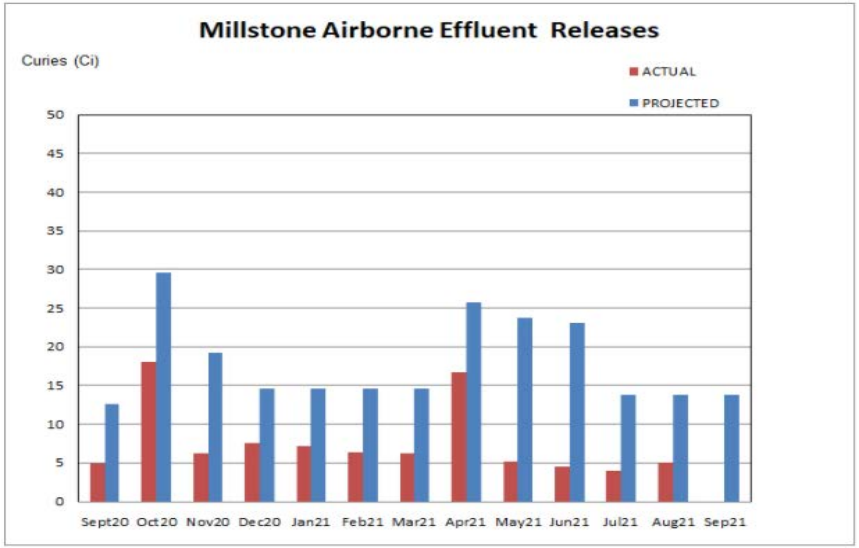
- Performance

Environmental Impacts

- No exceedances to report

Airborne Effluent Releases

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



Millstone Gaseous Radioactive Doses – August

Dose category[1]	Unit[2]	Limit[3]	Actual	% of limit
Noble gas gamma	mrad	0.833	0.000006	less than 0.0007
Noble gas beta	mrad	1.67	0.000011	less than 0.0006
Iodine, particulates, tritium	mrem	1.25	0.0047	less than 0.377
Total, whole body	mrem	2.08	0.0031	less than 0.150

Dominion Energy

Storm Response

- Henri
- Ida

Emergency Plan Event Declaration

- **Unusual Event declared November 8, 2020**
  - 3.6 magnitude off coast of Massachusetts
  - Unit 3 operators sensed the ground movement
  - Properly classified event per procedures
  - Unit 2 remained at 100% power
  - Unit 3 was already shut down for a refueling outage
  - Inspections identified no damage or issues
  - Event terminated the same day

Offsite Emergency Plan Changes

- NEI revision 6 EALs implemented December 17, 2020
- Transitioned ERO and offsite notification system from ARCOS to Everbridge on December 17, 2020
- Postponed 2020 Biennial exercise was completed June 8, 2021
  - – successful demonstration of protecting the health and safety of the public with no issues identified
  - – NRC positive comments on coordination between Millstone and DEEP for dose assessment

We Continue Making Improvements Increasing Safety and Reliability

- **Unit 2 Fall Refueling Outage Scope**
  - Main generator major inspections
  - Feedwater heater replacements
  - Battery charger replacement
  - Net metering installation
  - Reactor coolant pump motor replacement

Other Topics

- Unit 3 RCP Seal Performance
- Unit 3 Main Turbine Control System Status
- EDG Performance
- Unit Life Cycle Management

Contact Information

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Phone: 860-447-1791, ext. 0778

Dominion Energy

NUCLEAR ENERGY ADVISORY COUNCIL
December 16, 2021 6:00 PM
Zoom

MINUTES

Members Present
Rep Kevin Ryan, Chair
Alternate Chair Mr. Jeffrey Semancik representing DEEP Commissioner Dykes

Mr. Craig Salonia	Mr. R. Woolrich
Mr. James Sherrard	Mr. Bill Sheehan
Sen. C. Osten	Mr. J. McGunnigle

Members Not Present
Mr. A. Jordan

1. **Call to Order of Meeting**
   NEAC Chair Rep. Ryan called the meeting to order at 6:00 PM on Zoom.

2. **Council Business**
   a. **Introduction of New Members** – Chair Ryan introduced newly appointed Council members and had them provide their background.
      i. Senator Catherine Osten

   b. **Approval of Minutes of the September 15, 2021 NEAC meeting.**
      A motion was made to approve the minutes by Mr. Woolrich and seconded by Mr. Salonia. Sen Osten abstained as she was not a member for last meeting. Minutes were approved without any corrections or objections.

3. **Public Comment**
   There was one member of the public present. There were no comments from the public.

4. **NRC Correspondence Reviewed since past meeting.**
   The list of U. S. Nuclear Regulatory Commission (NRC) Correspondence was reviewed.
   a. Millstone Power Station, Unit No. 2 - Issuance of Amendment No. 343 Re: Revision to Technical Specifications for Steam Generator Inspection Frequency (EPID L-2020-LLA-0227) dated September 9, 2021.
   b. Millstone Power Station, Unit No. 3 - Issuance of Amendment No. 279 Re: Addition of Analytical Methodology to the Core Operating Limits Report for a Large Break Loss-Of-Coolant Accident (EPID L-2020-LLA-0242) dated October 5, 2021.
   c. Public Meeting Announcement and Presentation: Reactor Pressure Vessel Embrittlement Monitoring and Prediction in Long-Term Operation, October 18. 2021

d. Millstone Power Station, Unit Nos. 2 and 3 – Authorization and Safety Evaluation for Alternative Request No. RR-05-04 and IR-4-02 (EPID L-2020-LLR-0158) dated October 29, 2021.
e. Millstone Power Station Unit No. 3 - Issuance of Amendment No. 280 Regarding Measurement Uncertainty Recapture Power Uprate (EPID L-2020-LLS-0002) dated November 9, 2021.
f. Millstone Power Station, Unit 3 – Initial Operator Licensing Examination Report 05000423/2021301 dated November 10, 2021.
g. Millstone Power Station, Units 2 and 3 – Closeout of NRC Bulletin 2012-01, "Design Vulnerability In Electric Power System" (EPID L 2017-CRS-0063) dated November 15, 2021.

5. Other material reviewed

NEAC reviewed the following information:

a. Millstone Licensee Event Report 2021-01-000: Incorrectly Placed Spent Fuel Assemblies in Unit 2 Spent Fuel Pool dated September 23, 2021.
b. Millstone Power Station Non-Emergency Report Form, "Steam supply check valve to Turbine Driven Auxiliary Feedwater Pump failed Inspection" dated November 6, 2021.
c. Millstone Power Station Non-Emergency Report Form, "Non-Functional Steam supply check valve to Turbine Driven Auxiliary Feedwater Pump" dated November 14, 2021.
d. "Advanced Reactors for State Policymakers, in Brief Unlocking Advanced Nuclear Innovation: The Role of Fee Reform and Public Investment" (Nuclear Innovation Alliance), dated October 2021.

6. CY 2021 Annual Report Discussion

The Council discussed their observations of trends in safety and performance of Millstone Station during 2021. Agreed to highlight these in the annual report.

a. Mr. Woolrich and Mr. Salonia noted that vendor issues continue.
b. Mr. Salonia noted that operational incidents also continue to occur. Council discussed potential trends to observe
    i. Effect of station staff changes including loss of organizational knowledge.
    ii. Vendor performance and quality of vendor products
c. Council discussed Millstone's COVID response
    i. Council agreed that response has been adequate to protect critical station staff such as operators and emergency response organization.
d. Senator Osten suggested that the report highlight the role of the Nuclear Program at Three Rivers Community College in providing qualified workers.
e. Mr. Sheehan noted that the NRC is looking at life of reactor plant components with respect to embrittlement. Mr. Semancik noted that Dominion presentation also discussed extending license of plant to 80 years.

7. CY 2021 Annual Report Approval

A motion was made by Mr. Sheehan to review and approve the annual report by email to ensure it is available prior to the 2022 session of the CT General Assembly. The motion was seconded by Mr. Sherrard. The motion was unanimously approved with no objectives.

8. Approval of Regular Meeting Schedule for CY 2022

A motion was made by Mr. Sheehan to set the following dates and topics for their regular 2022 public meetings. Senator Osten seconded the motion; no objections; unanimous vote in favor.

a. March 24, 2022 – Millstone Annual Performance Meeting (US NRC Presentation)
    i. To include information on key technical items for consideration of license extension to 80 years and to 100 years.
b. June 16, 2022 – DEEP discussion on Millstone cooling water impact and water side tour.
c. September 15, 2022 – Millstone Operations Update (Dominion Presentation)
    i. To include discussion on vendor challenges and capabilities and Dominion process to ensure quality of vendors
d. December 15, 2022 – Annual Report Writing Meeting

9. Adjournment

Motion was made to adjourn by Mr. Sheehan and seconded by Mr. Sherrard; no objections; unanimous vote in favor; meeting adjourned at 7:01 PM.