



# 2021-2022 Information Digest

NUREG-1350, Volume 33  
Manuscript Completed: August 2021  
Date Published: October 2021

U.S. Nuclear Regulatory Commission  
Office of Public Affairs  
Washington, DC 20555-0001

[www.nrc.gov](http://www.nrc.gov)



# ABSTRACT

The U.S. Nuclear Regulatory Commission (NRC) has published the Information Digest annually since 1989. The Digest provides information about agency activities and licensees from the various industries it regulates. It describes the agency's responsibilities and activities, and provides general information on nuclear-related topics. The Information Digest includes NRC and industry data in an easy-to-read format. Infographics help explain the information with visual aids.

The 2021–2022 Information Digest includes NRC data in the appendices and non-NRC data (e.g., International Atomic Energy Agency, Energy Information Administration, and U.S. Department of Energy) that were updated as of August 10, 2021, including data in maps and graphics. The Digest is an annual publication, with updates to certain non-NRC data every 2 years.

The next Information Digest containing updated data will be published in September 2022. The Information Digest will include links to the most current information.

The NRC reviews the information from industry and international sources but does not independently verify it. The Web Link Index provides sources for more information on major topics. The NRC is the source of all photographs, graphics, and tables unless otherwise noted. All information is final unless otherwise noted. Any corrections and updates will appear in the digital version of the publication on the NRC Web site at <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1350/>.

The NRC welcomes comments or suggestions on the Information Digest. To submit comments, write to the Office of Public Affairs at U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or at [opa.resource@nrc.gov](mailto:opa.resource@nrc.gov).



# CONTENTS

<b>ABSTRACT .....</b>	<b>iii</b>
<b>NRC AT A GLANCE .....</b>	<b>xi</b>
<b>ACCOMPLISHMENTS AND HIGHLIGHTS FOR 2020–2021 .....</b>	<b>xvii</b>
<b>PHOTOS: THE NRC ON THE JOB.....</b>	<b>xxvi</b>
<b>1. NRC: AN INDEPENDENT REGULATORY AGENCY.....</b>	<b>1</b>
About the NRC .....	2
Mission Statement .....	3
Major Activities .....	5
Transforming the NRC .....	6
A Typical Rulemaking Process .....	7
Organizations and Functions .....	9
Fiscal Year 2021 Budget.....	12
<b>2. NUCLEAR ENERGY IN THE U.S. AND WORLDWIDE .....</b>	<b>15</b>
Worldwide Electricity Generated by Commercial Nuclear Power .....	16
International Strategy 2021–2025.....	17
International Activities .....	18
<b>3. NUCLEAR REACTORS.....</b>	<b>21</b>
U.S. Electricity Generated by Commercial Nuclear Power .....	22
U.S. Commercial Nuclear Power Reactors .....	23
Oversight of U.S. Commercial Nuclear Power Reactors.....	28
Reactor License Renewal.....	30
Nuclear Research and Test Reactors.....	33
New Commercial Nuclear Power Reactor Licensing .....	34
New Licensing of Nonpower Production and Utilization Facilities .....	40
Nuclear Regulatory Research.....	41
<b>4. NUCLEAR MATERIALS .....</b>	<b>45</b>
Materials Licenses .....	46
Medical and Academic.....	47
Industrial.....	48

Transportation .....	49
Materials Security.....	49
Nuclear Fuel Cycle.....	50
Fuel Cycle Facilities .....	53
<b>5. RADIOACTIVE WASTE .....</b>	<b>57</b>
Low-Level Radioactive Waste Disposal .....	58
High-Level Radioactive Waste Management .....	59
Transportation .....	65
Decommissioning.....	66
<b>6. SECURITY AND EMERGENCY PREPAREDNESS.....</b>	<b>71</b>
Facility Security .....	72
Cybersecurity .....	73
Materials Security.....	74
Emergency Preparedness .....	74
Incident Response .....	76
Emergency Classifications.....	76
International Emergency Classifications.....	77
<b>7. APPENDICES.....</b>	<b>79</b>
Abbreviations .....	80
Quick-Reference Metric Conversion Tables .....	83
<b>APPENDIX A:</b> Commercial Nuclear Power Reactors .....	85
<b>APPENDIX B:</b> New Nuclear Power Plant Licensing Applications .....	102
<b>APPENDIX C:</b> Commercial Nuclear Power Reactors Undergoing Decommissioning and Permanently Shut Down Formerly Licensed To Operate .....	104
<b>APPENDIX D:</b> Canceled Commercial Nuclear Power Reactors .....	108
<b>APPENDIX E:</b> Commercial Nuclear Power Reactors by Parent Company .....	115
<b>APPENDIX F:</b> Commercial Nuclear Power Reactor Operating Licenses —Issued by Year .....	117
<b>APPENDIX G:</b> Commercial Nuclear Power Reactor Operating Licenses —Expiration by Year, 2024–2055 .....	117
<b>APPENDIX H:</b> Operating Nuclear Research and Test Reactors Regulated by the NRC.....	118
<b>APPENDIX I:</b> Nuclear Research and Test Reactors under Decommissioning Regulated by the NRC .....	120
<b>APPENDIX J:</b> Radiation Doses and Regulatory Limits.....	120

<b>APPENDIX K:</b>	Commercial Nuclear Power Plant Licensing History 1955–2021 .....	121
<b>APPENDIX L:</b>	Materials Licenses by State.....	123
<b>APPENDIX M:</b>	Major U.S. Fuel Cycle Facility Sites.....	124
<b>APPENDIX N:</b>	Dry Spent Fuel Storage Designs: NRC-Approved for Use by General Licensees .....	125
<b>APPENDIX O:</b>	Dry Cask Spent Fuel Storage Licensees.....	126
<b>APPENDIX P:</b>	U.S. Low-Level Radioactive Waste Disposal Compact Membership...	130
<b>APPENDIX Q:</b>	NRC-Regulated Complex Materials Sites Undergoing Decommissioning .....	131
<b>APPENDIX R:</b>	Nuclear Power Units by Nation .....	132
<b>APPENDIX S:</b>	Nuclear Power Units by Reactor Type, Worldwide .....	133
<b>APPENDIX T:</b>	Native American Reservations and Trust Lands within a 50-Mile Radius of an Operating Nuclear Power Plant .....	134
<b>APPENDIX U:</b>	States with NRC Grant Recipients in Fiscal Year 2020 .....	135
<b>APPENDIX V:</b>	Significant Enforcement Actions Issued, 2020 .....	148
<b>APPENDIX W:</b>	Fundamental Laws Governing the U.S. Nuclear Regulatory Commission .....	140
<b>APPENDIX X:</b>	International Activities: Conventions and Treaties Pertaining to Nuclear Safety, Security, and International Safeguards .....	141
<b>APPENDIX Y:</b>	International Activities: List of Multilateral Organizations, Committees, and Working Groups in which the NRC Participates .....	142
<b>APPENDIX Z:</b>	International Activities: List of Import and Export Licenses Issued for 2020.....	144
<b>APPENDIX AA:</b>	List of Some Major Uses of Radioisotopes in the United States .....	147
<b>8. GLOSSARY</b> (includes abbreviations, definitions, and illustrations).....		<b>151</b>
<b>9. WEB LINK INDEX</b> .....		<b>181</b>

## FIGURES

## **NRC: AN INDEPENDENT REGULATORY AGENCY**

<b>Figure 1.</b>	How the NRC Regulates.....	2
<b>Figure 2.</b>	Transforming the NRC .....	6
<b>Figure 3.</b>	Typical Rulemaking Process.....	7
<b>Figure 4.</b>	NRC Organizational Chart .....	10
<b>Figure 5.</b>	NRC Regions .....	11
<b>Figure 6.</b>	NRC Total Authority, FYs 2011–2021 .....	12
<b>Figure 7.</b>	NRC FY 2021 Distribution of Budget Authority; Recovery of Enacted NRC Budget.....	13

## **NUCLEAR ENERGY IN THE U.S. AND WORLDWIDE**

<b>Figure 8.</b>	Nuclear Share of Electricity Generated by Country.....	16
------------------	--	----

## **NUCLEAR REACTORS**

<b>Figure 9.</b>	U.S. Gross Electricity Share by Energy Source, 2020 .....	22
<b>Figure 10.</b>	U.S. Electricity Generation by Energy Source, 2015–2020 .....	23
<b>Figure 11.</b>	Gross Electricity Generated in Each State by Nuclear Power .....	24
<b>Figure 12.</b>	U.S. Operating Commercial Nuclear Power Reactors .....	25
<b>Figure 13.</b>	Day in the Life of an NRC Resident Inspector.....	26
<b>Figure 14.</b>	NRC Post-Fukushima Safety Enhancements .....	27
<b>Figure 15.</b>	Reactor Oversight Action Matrix Performance Indicators .....	29
<b>Figure 16.</b>	Reactor Oversight Framework.....	29
<b>Figure 17.</b>	License Renewals Granted for Operating Nuclear Power Reactors.....	31
<b>Figure 18.</b>	U.S. Commercial Nuclear Power Reactors —Years of Operation by the End of 2020.....	31
<b>Figure 19.</b>	License Renewal Process .....	32
<b>Figure 20.</b>	Size Comparison of Commercial and Research Reactors.....	33
<b>Figure 21.</b>	U.S. Nuclear Research and Test Reactors.....	34
<b>Figure 22.</b>	The Different NRC Classifications for Types of Reactors .....	35
<b>Figure 23.</b>	New Reactor Licensing Process.....	36
<b>Figure 24.</b>	Locations of New Nuclear Power Reactor Active Applications and Approved Licenses .....	38
<b>Figure 25.</b>	NRC Research Funding, Fiscal Year 2021.....	42

## **NUCLEAR MATERIALS**

<b>Figure 26.</b>	U.S. Agreement States .....	46
<b>Figure 27.</b>	NRC Approach to Source Security .....	49
<b>Figure 28.</b>	The Nuclear Fuel Cycle .....	50
<b>Figure 29.</b>	The In Situ Uranium Recovery Process .....	51
<b>Figure 30.</b>	Locations of NRC-Licensed Uranium Recovery Facility Sites .....	52
<b>Figure 31.</b>	Locations of NRC-Licensed Fuel Cycle Facilities.....	54
<b>Figure 32.</b>	Simplified Fuel Fabrication Process .....	54

## **RADIOACTIVE WASTE**

<b>Figure 33.</b>	Low-Level Radioactive Waste Disposal .....	59
<b>Figure 34.</b>	Spent Fuel Generation and Storage after Use .....	60
<b>Figure 35.</b>	Dry Storage of Spent Nuclear Fuel.....	62
<b>Figure 36.</b>	Licensed and Operating Independent Spent Fuel Storage Installations by State .....	64
<b>Figure 37.</b>	Ensuring Safe Spent Fuel Shipping Containers .....	65
<b>Figure 38.</b>	Reactor Phases of Decommissioning.....	66
<b>Figure 39.</b>	Power Reactor Decommissioning Status .....	67
<b>Figure 40.</b>	Locations of NRC-Regulated Sites Undergoing Decommissioning .....	69

## **SECURITY AND EMERGENCY PREPAREDNESS**

<b>Figure 41.</b>	Security Components.....	73
<b>Figure 42.</b>	Emergency Planning Zones.....	75
<b>Figure 43.</b>	The International Nuclear and Radiological Event Scale .....	77



# NRC AT A GLANCE

## ***Mission Statement***

The NRC licenses and regulates the Nation's civilian use of radioactive materials to provide reasonable assurance of adequate protection of public health and safety, and to promote the common defense and security, and to protect the environment.

## ***Commission***

Chairman Christopher T. Hanson	Term ends June 30, 2024
Commissioner Jeff Baran	Term ends June 30, 2023
Commissioner David A. Wright	Term ends June 30, 2025
Vacant	Term ends June 30, 2022
Vacant	Term ends June 30, 2026

## ***Locations***

### **Headquarters:**

U.S. Nuclear Regulatory Commission Rockville, MD	301-415-7000 800-368-5642
---	------------------------------

### **Regional Offices:**

Region I—King of Prussia, PA	610-337-5000 800-432-1156
Region II—Atlanta, GA	404-997-4000 800-577-8510
Region III—Lisle, IL	630-829-9500 800-522-3025
Region IV—Arlington, TX	817-200-8100 800-952-9677

## ***Headquarters Operations Center***

Rockville, MD	301-816-5100
---------------	--------------

The NRC maintains a staffed, 24-hour Operations Center that coordinates incident response with Federal, State, Tribal, and local agencies.

## ***Training and Professional Development***

Technical Training Center Chattanooga, TN	423-855-6500
Professional Development Center Rockville, MD	301-287-0556

## ***Resident Sites***

At least two NRC resident inspectors, who report to the appropriate regional office, are assigned at each operating nuclear power plant site.

## ***NRC Fiscal Year 2021 Budget***

- *Total authority: \$879 million (\$844 million enacted budget and \$35 million authorized carryover)*
- *Total authorized staff: 2,868 full-time equivalents*
- *Estimated fees to be recovered: \$721.4 million*
- *Separate appropriation for the Office of the Inspector General: \$13.5 million*
- *Total research budget: \$77 million*
  - *Reactor Program: \$55 million*
  - *New/Advanced Reactor Licensing: \$18 million*
  - *Materials and Waste: \$4 million*

## ***What Does the NRC Do?***

- *Regulation and guidance—rulemaking*
- *Policymaking*
- *Licensing, decommissioning, and certification*
- *Research*
- *Oversight and enforcement*
- *Incident response*
- *Emergency preparedness and response*

## ***Nuclear Governing Legislation***

The NRC was established by the Energy Reorganization Act of 1974. The most significant laws that govern the regulatory process of the agency are in Appendix W of this Information Digest. The NRC's regulations are found in Title 10, "Energy," of the Code of Federal Regulations (10 CFR). The text of many laws may be found in NUREG-0980, "Nuclear Regulatory Legislation."

## **NRC BY THE NUMBERS**

### ***U.S. Electricity Generated by Commercial Nuclear Power***

NRC-licensed nuclear reactors generate about 19 percent of U.S. gross electricity, or about 807 billion kilowatt-hours.

### ***Nuclear Reactors***

- *93 commercial nuclear power reactors operating in 28 States at 55 sites*
- *62 pressurized-water reactors and 31 boiling-water reactors*
- *Four reactor fuel vendors*
- *21 parent operating companies*
- *About 80 different designs*
- *About 5,530 total inspection and assessment hours at each operating reactor in 2020*
- *Licensees expected to shut down or not seek license renewal include the following:*
  - *Palisades (Entergy) will close by May 31, 2022*
  - *Diablo Canyon Units 1 and 2 (Pacific Gas and Electric) plan to close by November 2024 and August 2025, respectively*

## **Reactor License Renewal**

Commercial power reactor operating licenses are valid for 40 years and may be renewed for additional 20-year terms.

- 94 reactors have been issued initial renewed licenses, including 9 reactors now permanently shut down.
- Eight reactors operate under their original licenses.

## **Subsequent License Renewal**

This type of licensing would allow plants to operate from 60 to 80 years.

- Six reactors at three sites have been issued subsequent renewed licenses.
- Seven reactors at three sites have subsequent license renewal applications under review.
- Two licensees with a total of five reactors have submitted letters of intent to request subsequent license renewals.

## **Early Site Permits for New Reactors**

- Six early site permits have been issued:
  - System Energy Resources, Inc., for the Grand Gulf site in Mississippi
  - Exelon Generation Co., LLC, for the Clinton site in Illinois
  - Dominion Nuclear North Anna, LLC, for the North Anna site in Virginia
  - Southern Nuclear Operating Co., for the Vogtle site in Georgia
  - PSEG Power, LLC, and PSEG Nuclear, LLC, for a site in New Jersey
  - Tennessee Valley Authority for two or more small modular reactor modules at the Clinch River Nuclear Site in Tennessee

## **Combined License — Construction and Operating License for New Reactors**

- Since June 2007, the NRC has received and docketed 18 combined license (COL) applications for 28 new, large light-water reactors. The NRC has received and docketed a COL application for the Oklo advanced reactor.
- The NRC suspended or canceled 10 COL application reviews at the request of the applicants for Bell Bend, PA; Bellefonte, AL; Callaway, MO; Calvert Cliffs, MD; Comanche Peak, TX; Grand Gulf, MS; Nine Mile Point, NY; River Bend, LA; Shearon Harris, NC; and Victoria County Station, TX.
- The NRC has issued COLs for 14 reactors at Fermi, MI; Levy County, FL; North Anna, VA; South Texas Project, TX; Turkey Point, FL; V.C. Summer, SC; Vogtle, GA; and W.S. Lee, SC.
- At the licensee's request, six COLs have been terminated at three sites: Levy County Units 1 and 2 (terminated on April 26, 2018); South Texas Project Units 3 and 4 (terminated on July 12, 2018); and V.C. Summer Units 2 and 3 (terminated on March 6, 2019).

## **Reactor Design Certification**

- Six reactor design certifications (DCs) have been issued:
  - General Electric-Hitachi Nuclear Energy's ABWR (Advanced Boiling-Water Reactor)
  - Westinghouse Electric Company's System 80+
  - Westinghouse Electric Company's AP600
  - Westinghouse Electric Company's AP1000
  - General Electric-Hitachi Nuclear Energy's ESBWR (Economic Simplified Boiling-Water Reactor)
  - Korean Electric Power Corporation APR1400 (Advanced Power Reactor)

- One DC application review was completed by NRC staff for the NuScale small modular reactor design and issued a final safety evaluation report. The NRC staff published the proposed NuScale small modular reactor design certification rule for public comment on July 1, 2021.
- The NRC completed review of one DC renewal application for the ABWR design. The final rule for the ABWR design is effective September 29, 2021.
- Two DC applications for the U.S. EPR (Evolutionary Pressurized-Water Reactor) and US-APWR (Advanced Pressurized-Water Reactor) are suspended at the request of the applicants.

### ***Nonpower Production and Utilization Facilities***

- *Research and Test Reactors*
  - 31 licensed research and test (nonpower) reactors operate in 21 States.
- *Medical Radioisotope Facilities*
  - Two construction permits have been issued to SHINE Medical Technologies, LLC, in Janesville, WI, and Northwest Medical Isotopes, LLC, in Columbia, MO.
  - One operating license application is under review (SHINE).

## **NUCLEAR MATERIALS**

### ***Materials Licensing***

- *The NRC and the Agreement States have more than 18,000 licensees for medical, academic, industrial, and general users of nuclear materials.*
  - *The NRC regulates nearly 2,200 licenses.*
  - *The 39 Agreement States regulate more than 16,000 licenses.*
- *Connecticut and Indiana have submitted letters of intent to become Agreement States, a process that takes about 5 years to complete, including legislative action within the States.*
- *The agency issues approximately 1,600 new licenses, renewals, or amendments for existing materials licenses annually. The NRC conducts approximately 600 to 800 safety, and security inspections of materials licensees each year.*

### ***Nuclear Fuel Cycle***

- *Three uranium recovery sites are licensed by the NRC.*
- *The NRC licenses nine active fuel cycle facilities:*
  - *One uranium hexafluoride conversion facility (“ready-idle” status)*
  - *Five uranium fuel fabrication facilities*
  - *Two gas centrifuge uranium enrichment facilities (one operating and one under construction)*
  - *One depleted uranium deconversion facility (construction decision pending)*
- *The NRC issues about 45 fuel cycle facility licensing actions per year, including amendments; renewals; new licenses; and safety, environmental, and safeguards reviews.*

### ***National Source Tracking System***

The National Source Tracking System, also known as NSTS, tracks more than 76,000 sources held by about 1,100 NRC and Agreement State licensees. Of those sources, about 52 percent are Category 1 sources and 48 percent are Category 2. The majority are cobalt-60, the most widely used isotope in large sources.

## ***Domestic Safeguards***

The NRC and the U.S. Department of Energy (DOE) use the Nuclear Materials Management and Safeguards System (NMMSS) to track transfers and inventories of source and special nuclear material. Licensees must report their inventories, transfers, purchases, and sales (including import and export) of these materials to the NMMSS. More than 300 licensees report to the NMMSS database, verifying their inventories at least annually by reconciling their transactions against the previous year's inventory. The database supports U.S. participation in the Treaty on the Non-Proliferation of Nuclear Weapons.

## **RADIOACTIVE WASTE**

### ***Low-Level Radioactive Waste***

- *10 regional compacts*
- *Four State-licensed disposal facilities*

## **HIGH-LEVEL RADIOACTIVE WASTE MANAGEMENT**

### ***Spent Nuclear Fuel Storage***

- *The NRC has issued 81 licenses for independent spent fuel storage installations in 35 States:*
  - *16 site-specific licenses (two of these facilities are licensed but were never built or operated) this includes the Interim Storage Partners CISF license that was issued September 13, 2021*
  - *65 general licenses*
- *An application is under review for consolidated interim storage facility for spent fuel in Lea County, NM.*

### ***Transportation—Principal Licensing and Inspection Activities***

- *Approximately 1,000 safety inspections of fuel, reactor, and materials licensees are conducted annually.*
- *Annually, 50–70 new, renewed, or amended container-design applications for the transport of nuclear materials are reviewed.*
- *Approximately 150 license applications for the import and export of nuclear materials from the United States are reviewed annually.*
- *More than 3 million packages of radioactive materials are shipped each year in the United States by road, rail, air, or water. This represents less than 1 percent of the Nation's yearly hazardous material shipments.*

### ***Decommissioning***

- *Approximately 100 materials licenses are terminated each year. The NRC's materials decommissioning program focuses on the termination of licenses that are not routine and that require complex activities.*
- *25 nuclear power reactors are in various stages of decommissioning (DECON or SAFSTOR).*
- *Three research and test reactors are permanently shut down and in various stages of decommissioning.*
- *11 complex materials sites are in various stages of decommissioning.*
- *Two fuel cycle facilities are in partial decommissioning, and one is undergoing decommissioning.*
- *Five NRC-licensed uranium recovery facilities are in various stages of decommissioning.*

## SECURITY AND EMERGENCY PREPAREDNESS

- *Every 2 years, each operating nuclear power plant performs a full-scale emergency preparedness exercise inspected by the NRC and evaluated by the Federal Emergency Management Agency.*
- *Plants conduct additional emergency drills between full-scale exercises to maintain their preparedness and proficiency in responding to emergencies.*
- *The NRC spends about 15,000 hours a year scrutinizing security at nuclear power plants, including 8,000 hours of force-on-force inspections. These inspections include mock combat drills, which are conducted at each site every 3 years.*
- *The NRC has implemented a comprehensive cybersecurity oversight program for power reactors, which includes routine inspections and requires licensees to isolate critical systems from the Internet.*



*The NRC Operations Center, located in the agency's Three White Flint North headquarters building, serves as the center when an emergency occurs or when the agency conducts exercises.*



# ACCOMPLISHMENTS AND HIGHLIGHTS 2020–2021

## COVID-19

In March 2020, the NRC formed a task force to lead a coordinated agencywide response to the COVID-19 pandemic. The primary goals were to maintain the agency's important safety and security mission while also protecting employees and mitigating the spread of the virus at NRC worksites. By April 2020, approximately 98 percent of the agency workforce, including its inspectors, were successfully working remotely.

The task force oversaw the implementation of Federal requirements in response to the pandemic; engaged with other Federal agencies on their COVID response; developed agencywide guidance and protocols; and communicated on related NRC activities with internal and external stakeholders through virtual meetings, collaboration tools, social media, and dedicated internal and external Web pages.

Key NRC actions related to COVID-19 include the following:

- *Developing COVID-19 guidance for nuclear power plant licensees and nuclear materials licensees*
- *Communicating regularly with nuclear facilities to discuss current activities and future plans, including staffing, reactor operator licensing, reductions in nonessential maintenance, fire brigade staff requirements, and other matters*
- *Providing the nuclear industry with information to facilitate the expedited review of requests for temporary exemptions, such as to work-hour limits, to allow flexibility in maintaining an appropriate workforce to meet the NRC's minimum reactor operator and security staffing requirements*
- *Deferring licensee invoicing for annual fees (10 CFR Part 171) and user fees (10 CFR Part 170) normally due in the third quarter of Fiscal Year (FY) 2020*
- *Informing licensees how to request extensions to requirements to account for special nuclear materials and request temporary relief from some agency requirements while maintaining safety*
- *Providing information to NRC licensees to facilitate expedited review of requests for temporary exemptions from some biennial emergency preparedness exercise requirements*
- *Completing "full implementation" inspections and engaging stakeholders during development of a draft baseline cyber inspection procedure that will be used in CY 2022.*
- *Approving more than 250 licensing actions seeking temporary flexibilities to maintain the safe and secure operation of reactor licensees during the pandemic*
- *Issuing general enforcement guidance on how the agency will examine potential violations of NRC regulations related to COVID-19*
- *Adjusting inspection plans and schedules to safeguard the health and safety of NRC and licensee staff while effectively implementing the Reactor Oversight Program*
- *Adjusting security and emergency preparedness inspections schedules related to COVID-19*
- *Performing a lessons-learned and best practices review, resulting in recommendations to address information technology and changes to remote oversight when site access may be restricted*
- *Extending public comment deadlines to afford additional opportunities for public involvement during the pandemic*
- *Creating a new NRC eLearning initiative to help parents with children attending school virtually and for adults who want to know more about science, nuclear technology, and the NRC*

## *Power Reactors*

- *Completed more than 1,350 licensing actions and other licensing tasks that support operating, new, and advanced reactors, including numerous actions related to the adoption of risk-informed initiatives, topical reports, and the safe transition of operating plants to decommissioning*
- *Provided a revision of NUREG-1409, “Backfitting Guidelines,” to the Commission*
- *Issued a memorandum to the Commission describing the status of the NRC’s review of construction tests and analysis, inspection, and licensing activities for Vogtle Unit 3*
- *Continued preparation for the end of Vogtle construction by risk-informing the baseline inspection program for AP1000 reactors and finalizing plans to transition Vogtle Units 3 and 4 from construction to the operating reactor oversight process*
- *Rolled out a new Web-based portal for licensee submission of proposed alternatives to codes and standards per 10 CFR 50.55a(z)*
- *Provided to the Commission several rulemakings such as the ABWR design certification (DC) renewal, NuScale small modular reactor DC, AP1000 DC extension*
- *Completed several key activities related to accident tolerant fuel (ATF) including issuance of a report by Energy Research, Inc. that covers the performance of the reactor during severe accidents for the current ATF concepts, higher burnup fuel, and fuel with enrichment above five weight percent; redesigning the ATF public Web site; and hosting two large workshops on licensing of higher burnup and increased enrichment fuel*
- *Granted subsequent license renewals for Surry Units 1 and 2, authorizing reactor operation from 60 to 80 years*
- *Accepted for review two subsequent license renewal applications for North Anna Units 1 and 2 and Point Beach Units 1 and 2*
- *Accepted for review the first digital instrumentation and control (DI&C) pilot application for Waterford using the new DI&C licensing process providing for an earlier licensing decision on the safety of the design*
- *Issued a revision to staff guidance regarding the evaluation of defense-in-depth and diversity to address a potential common-cause failure in digital safety systems*
- *Published technology-inclusive guidance for use by the NRC staff in reviewing the instrumentation and controls portions of non-light-water reactor applications*
- *Developed preliminary proposed rule language and held multiple public workshops regarding the safety and security requirements for the 10 CFR Part 53, “Licensing and regulation of advanced nuclear reactors,” rulemaking on a risk-informed, technology-inclusive regulatory framework for advanced reactors, with a publication target of October 2024*
- *Completed reviews of several topical reports and continued various other preapplication engagement activities with reactor vendors and applicants, including those selected by the Department of Energy, to construct and operate advanced nuclear power reactors under the Advanced Reactor Demonstration Program*
- *Issued several guidance and policy documents to support future licensing of advanced reactors on topics such as fuel qualification methodology; policy, licensing, and environmental considerations associated with micro-reactors; and instrumentation and controls systems*
- *Finalized guidance on a risk-informed process for evaluations to establish a more efficient means to review licensing actions that address issues of low safety significance within the licensing basis*
- *Issued revised guidance to enhance regulatory efficiencies by enabling licensee peer review of newly developed methods for use in probabilistic risk assessments*
- *Completed reviews on all seismic probabilistic risk assessments and external flooding submittals in response to the agency’s post-Fukushima actions resulting in safety enhancements and an improved ability to cope with the reevaluated hazards*

- *Approved multiple applications for the adoption of advanced risk management programs (such as 15 Risk-Informed Completion Times applications and the last National Fire Protection Agency 805 application)*
- *Completed 99 percent of calendar year 2020 required inspection and assessment activities of the Reactor Oversight Process, despite significant challenges due to COVID-19*
- *Issued a new Inspection Manual chapter to assist staff in reviewing licensee evaluations of changes to facility design, procedures, tests, or experiments in instances where a license amendment is not required to make the change*
- *Developed and began implementing an operating experience dashboard to provide staff with centralized access to information and ability to view, search, and use relevant operating experience data and trends*
- *Implemented various data analysis initiatives to enhance and modernize new and operating reactor workload and financial management across multiple business lines*
- *Prepared a rulemaking plan to update and transform the NRC's environmental review process*
- *Published an Advance Notice of Proposed Rulemaking for Alternatives to the Use of Credit Ratings*
- *Issued Interim Staff Guidance, "Micro-Reactor Applications, COL-ISG-029, Environmental Considerations Associated with Micro-Reactors"*
- *Published proposed rule for the NuScale small modular reactor DC*
- *Issued orders approving the transfers of Indian Point Units 1, 2, and 3 and Three Mile Island Unit 2 licenses for the purpose of decommissioning*
- *Provided technical expertise to the U.S. Navy for decommissioning of the Surface Ship Support Barge under an interagency agreement*
- *Completed 61 force-on-force inspections, testing licensees' abilities to protect against the Design Basis Threat during the COVID-19 public health emergency*
- *Reviewed and accepted three industry-proposed revisions to current cybersecurity guidance to enhance the identification and protection of the critical digital assets associated with the safety-related and emergency preparedness functions*
- *Conducted 154 baseline security inspections at operating power reactors and Category I fuel cycle facilities*
- *Issued Revision 6 of Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," which describes and endorses acceptable methods for implementing the emergency preparedness regulations*
- *Issued Revision 1 of NUREG/CR-7002, "Criteria for Development of Evacuation Time Estimate Studies," resulting in significant enhancements for use by licensees when analyzing 2020 decennial census data*
- *Continued to synchronize physical security inspections of Vogtle Units 1 and 2 with Unit 3, improving efficiency in the oversight program*
- *Signed a memorandum of understanding with Cooper Nuclear Station to participate in the RAPBack Program, which allows both parties to receive notification of activity on individuals who hold positions of trust or who are under criminal justice supervision or investigation*

## *Nonpower Reactors*

- *Granted SHINE Medical Technologies, LLC, an exemption that provides flexibility to procure facility-specific and other components for the construction of the SHINE medical isotope production facility*

## *Nuclear Materials and Waste*

- *Completed approximately 1,400 radioactive materials licensing actions*
- *Transitioned inspection activities, Integrated Materials Performance Evaluation Program (IMPEP) activities, and public meetings to a remote environment in response to the COVID-19 pandemic to minimize impact to the agency's oversight programs and stakeholder engagement*
- *Completed six IMPEP reviews, including the first consolidated IMPEP of NRC licensing and oversight programs*
- *Issued a revision to Management Directive 5.1, "Consultation and Coordination with Governments and Indian Tribes," in July 2020 to ensure that written communications are provided to Federally recognized Indian Tribes for providing input on NRC regulatory actions after the agency's final decision*
- *Completed the revisions of 13 State Agreement procedures to implement the revised Management Directive 5.6, "Integrated Materials Performance Evaluation Program"*
- *Issued revisions to five State Agreement and State Liaison procedures to support NRC Agreement States and enhance joint oversight of the National Materials Program*
- *Issued a technical evaluation report for Exubriion Therapeutics' proposed license application template for the use by the NRC and Agreement States' applicants and licensees for use of a tin-117m colloid to treat osteoarthritis in large dogs*
- *Issued five Approved Spent Fuel Storage Casks Certificates of Compliance*
- *Issued Centrus Energy Corp./American Centrifuge Operating's license amendment for the High-Assay Low-Enriched Uranium Demonstration Program*
- *Issued reports for the fuel cycle smarter inspection program and the independent spent fuel storage installation (ISFSI) oversight enhancement initiatives to ensure safety as well as provide for a comprehensive and consistent inspection program*
- *Issued NUREG-2224, "Dry Storage and Transportation of High Burnup Spent Nuclear Fuel," which includes approaches for enhancing the effectiveness and efficiency of licensing and certification of high burnup spent nuclear fuel in transportation and dry storage*
- *Endorsed the "ISFSI License and Cask CoC Format Content, and Selection Criteria" document to improve the dry storage licensing process by applying risk insights to clarify the information required in certificates of compliance and technical specifications and removing or relocating details that are not risk significant*
- *Renewed the license for the Honeywell International uranium conversion plant in Metropolis, IL, after concluding that renewing the license will not pose an undue risk to public health and safety and will not significantly affect the quality of the environment*
- *Renewed the license for the Humboldt Bay ISFSI for an additional 40 years; the renewed license includes implementation of an aging management program to ensure that important-to-safety structures, systems, and components will continue to perform their intended functions during the extended storage period authorized by the renewal*
- *Terminated the materials license for the General Atomics facility in San Diego, CA*
- *Submitted a report to Congress identifying best practices for establishing and operating local community decommissioning advisory boards, as required by the Nuclear Energy Innovation and Modernization Act*
- *Signed a memorandum of understanding with the Environmental Protection Agency to improve coordination and cooperation in the regulation of the in situ recovery process of uranium extraction*

- Used pre-recorded radio broadcasts both in English and the Navajo Diné language to communicate on NRC activities during the public comment period for the United Nuclear Corporation Church Rock Project Draft Environmental Impact Statement
- Issued a license on Sept. 13 to Interim Storage Partners LLC to construct and operate a consolidated interim storage facility for spent nuclear fuel in Andrews, Texas.

## Agencywide

- Continued to oversee the safe and secure operation of nuclear power plants and fuel cycle facilities, as well as the possession and use of radioactive materials
- Made significant progress toward the transformation vision of being a modern, risk-informed regulator, particularly in the areas of innovation; employee retention, recruitment, and development; use of risk insights; and technology adoption
- Launched the internal agencywide “innovation platform,” and collected more than 480 innovation success stories and hosted approximately 20 innovation challenge campaigns
- Established a framework to incorporate risk considerations across all business lines and platforms, which was used to help determine certain licensing actions in response to COVID-19 considerations
- Provided technology infrastructure and training to allow 98 percent of the NRC workforce to transition to mandatory telework within days due to the COVID-19 pandemic, and increased the use of dashboards to enhance the automated use of data for decisionmaking and data analysis
- Established two career development platforms for NRC employees
- Overall achievements that contributed to the agency’s desired culture efforts:
  - Administered three Culture and Climate Surveys to 1,200 employees in March 2020, which created a baseline for culture improvement efforts
  - Developed an Agencywide Improvement Strategy and Implementation Plan and delivered presentations to staff.
  - Administered the Federal Employee Viewpoint Survey to all employees in September 2020 with 83 percent participation. The results showed 4 percent increase in employee engagement index (78 percent positive) and 3 percent increase in global satisfaction (75 percent positive).
  - Conducted discussions with management and champions in 22 offices and regions to review office/region-level culture improvement plans and identify best practices to share more broadly
  - Administered a culture pulse survey to all employees in April 2021 with 57 percent participation. The culture pulse survey showed a slight increase in constructive behavior; a significant decrease in defensive behavior; and increases in perceptions of employee involvement, communication, and adaptability.
  - Held three Executive Director for Operations Town Hall meetings to create a dialogue between staff and senior management about emergent topics of wide interest
  - Held 17 Leader Behavior Check-In sessions with groups of senior managers in June 2021 to create forums for leadership to model constructive behaviors in the agency’s desired culture
- Continued implementing innovative solutions via EMBARK Venture Studio to enable and promote a risk-informed mindset within the nuclear reactor safety program and other business lines
- Pursued substantial rulemaking activities on topics including American Society of Mechanical Engineers codes and code cases; licensing of advanced reactors; categorical exclusions from environmental reviews; and petitions for rulemaking submitted by members of the public
- Implemented Fiscal Year (FY) 2020 eBilling, a public facing, Web-based application for use by NRC licensees, that provides immediate delivery of NRC invoices, customizable e-mail notifications, the capability to view and analyze invoice details, and the convenience to access U.S. Treasury systems to pay invoices

- Issued 61 escalated enforcement actions under traditional enforcement, the Reactor Oversight Process, and the Construction Reactor Oversight Process; processed 15 enforcement actions that involved civil penalties (14 proposed, 1 imposed) totaling \$1,586,413 proposed and \$606,942 imposed; 9 were enforcement orders without a proposed civil penalty, and 37 were escalated notices of violation without a proposed civil penalty
- Published research results on a variety of topics related to operating facility safety, safety analysis, severe accident analysis, improved methods for risk assessment, embedded digital devices, flood hazard assessment, advanced manufacturing, and fire modeling
- Continued collaboration with the DOE under the Nuclear Energy Innovation Capabilities Act through signing a technical addendum on light-water reactor sustainability and MELCOR source term evaluation, and through a separate agreement with DOE on operating experience and data analysis sharing
- Continued collaboration with the DOE under the Nuclear Energy Innovation Capabilities Act through signing technical addenda for the National Reactor Innovation Center, on light-water reactor sustainability, and MELCOR source term evaluation, and through a separate agreement with DOE on operating experience and data analysis sharing.
- Received 88 educational proposals and 160 research and development (R&D) proposals under the Integrated University Program Funding Opportunity Announcements, grants awarded included 45 educational grants and 15 R&D grants totaling \$17.9 million in grants to 33 academic institutions.

### *International Activities*

- Represented the NRC as part of U.S. delegations, negotiating agreements for civil nuclear cooperation (Section 123 Agreements) and participating in activities such as meetings of the Nuclear Suppliers Group, International Atomic Energy Agency (IAEA) Board of Governors, and Group of Seven Nuclear Safety and Security Group
- Issued 60 licenses to export nuclear materials and equipment
- Supported the development of enhanced regulatory infrastructure for radiological sources, research reactors, and nuclear power plant safety and security around the world through the provision of technical expertise and assistance funding thereby reinforcing U.S. Government national security and foreign policy objectives
- Participated in a U.S. Government delegation to international meetings addressing the implementation of treaties and conventions, including the Technical Meeting of Representatives to the Convention on the Physical Protection of Nuclear Materials (CPPNM) and its Amendment (A/CPPNM), and the meeting of the Preparatory Committee for the Conference of the Parties to the Amended CPPNM
- Participated in hundreds of virtual meetings with regulatory counterparts after international travel was suspended due to COVID-19
- Continued work under a first-of-a-kind memorandum of cooperation with the Canadian Nuclear Safety Commission to increase regulatory effectiveness through collaboration on the technical reviews of advanced reactors and small modular reactors
- Supported establishment of the Framework for Irradiation Experiments with the Organization for Economic Co-operation and Development/Nuclear Energy Agency to provide testing and examination capabilities for fuels and materials research to support new reactor technologies

## *Administration*

- *Processed 288 Freedom of Information Act (FOIA) requests and 24 appeals in FY 2020, with 81 FOIA requests and 3 FOIA appeals pending by the end of FY 2020*
- *Conducted 155 investigation cases by the Office of Investigations for FY 2020 including 110 investigations, 60 of which were carried over from FY 2019, and also 45 assists to staff, 5 of which were carried over from FY 2019*
- *Conducted agency outreach to audiences interested in NRC activities, including through the use of social media*
- *Awarded and administered the agency's acquisition portfolio with obligations estimated more over \$255 million in FY 2020*

## *Public Meetings and Involvement*

- *Revised the agency's public meeting policy and defined new public meeting categories to interact more effectively with stakeholders and the public*
- *During calendar year 2020 conducted approximately 639 open public meetings addressing a full range of NRC issues to support transparency with agency stakeholders and conducted 31 closed meetings*
- *Conducted 10 full committee meetings of the Advisory Committee on Reactor Safeguards and approximately 47 subcommittee meetings in fiscal year 2021; all of the ACRS meetings during the fiscal year were conducted virtually in response to COVID-19*
- *Held four public meetings of the Advisory Committee on the Medical Uses of Isotopes in calendar year 2020*
- *Hosted the first ever, all-virtual Regulatory Information Conference, which was also the highest attended to date with more than 4,300 people attending and 50 countries represented*
- *Created a new NRC eLearning initiative for children and adults who would like to know more about science, nuclear technology, and the NRC*

## *News and Information*

- *Maintained the NRC Web site and free listserv subscription services at <https://www.nrc.gov/public-involve/listserve.html> to post and distribute NRC news releases*
- *Shared information with the public using social media through platforms that address the major categories of social communication, with a focus on social networking and microblogging (Facebook, LinkedIn and Twitter, respectively)*
- *In calendar year 2020, gained 960 followers on Twitter and sent 470 tweets; gained more than 880 page likes and published approximately 280 posts on Facebook; gained more than 3,000 followers and published approximately 100 posts on LinkedIn.*
- *Issued 146 news releases in FY 2020*

For more information on the agency's accomplishments, go to <https://www.nrc.gov/reading-rm/doc-collections/congress-docs/>.

# CONTACT US

## **U.S. Nuclear Regulatory Commission**

800-368-5642

301-415-7000

Hearing Impaired Access TTY:

240-428-3217

<https://www.nrc.gov>

## **Public Affairs**

301-415-8200

fax: 301-415-3716

e-mail: [opa.resource@nrc.gov](mailto:opa.resource@nrc.gov)

## **Public Document Room**

800-397-4209

fax: 301-415-3548

## **Employment**

Human Resources: 301-415-7400

General Counsel Intern Program

Honor Law Graduate Program

or 2-Year Judicial Clerkship Program:

301-415-1515

## **Contracting Opportunities**

Small Business:

800-903-7227

## **License Fee Help Desk**

301-415-7554

e-mail: [fees.resource@nrc.gov](mailto:fees.resource@nrc.gov)

## **Mailing Address**

U.S. Nuclear Regulatory Commission

Washington, DC 20555-0001

## **Delivery Address**

NRC Storage and Distribution Facility

4934 Boiling Brook Parkway

Rockville, MD 20852

# REPORT A CONCERN

## *Emergency*

Report an emergency involving a nuclear facility or radioactive materials, including the following:

- *any accident involving a nuclear reactor, nuclear fuel facility, or radioactive materials*
- *lost or damaged radioactive materials*
- *any threat, theft, smuggling, vandalism, or terrorist activity involving a nuclear facility or radioactive materials*

Call the NRC's 24-Hour Headquarters Operations Center: 301-816-5100.

The NRC accepts collect calls. The agency records all calls to this number.

## *Non-Emergency*

This includes any concern involving a nuclear reactor, nuclear fuel facility, or radioactive materials. You may send an e-mail to [allegations@nrc.gov](mailto:allegations@nrc.gov). However, because e-mail transmission may not be completely secure, if you are concerned about protecting your identity, it is preferable that you contact us by telephone or in person. You may contact any NRC employee (including a resident inspector) or call:

*The NRC's Toll-Free Safety Hotline: 800-695-7403*

Calls to this number are not recorded between the hours of 7 a.m. and 5 p.m. eastern time. However, calls received outside these hours are answered by the Headquarters Operations Center on a recorded line.

Some materials and activities are regulated by Agreement States, and concerns should be directed to the appropriate State radiation control program, a list of which can be found at <https://scp.nrc.gov/allegations.html>.

## THE NRC'S OFFICE OF THE INSPECTOR GENERAL

The Office of the Inspector General (OIG) at the NRC established the OIG Hotline to provide NRC employees, other government employees, licensee and utility employees, contractor employees, and the public with a means of confidentially reporting suspicious activity to OIG concerning fraud, waste, abuse, and employee or management misconduct. Mismanagement of agency programs or danger to public health and safety may also be reported through the hotline.

It is not OIG policy to attempt to identify people contacting the OIG Hotline. People may contact OIG by telephone, through an online form, or by mail. There is no caller identification feature associated with the hotline or any other telephone line in the Inspector General's office. No identifying information is captured when you submit an online form. You may provide your name, address, or telephone number, if you wish.

*Call the OIG Hotline:*

**800-233-3497**

**7 a.m. – 4 p.m. (eastern time)**

**After hours, please leave a message.**



*NRC inspectors keep a close eye on construction activities to ensure NRC regulations are being met at Vogtle Units 3 and 4, in Georgia.*



*NRC Office of Nuclear Security and Incident Response Director Mirela Gavrilas observes new construction activities at Vogtle Units 3 and 4, in Georgia.*

## **PHOTOS: NRC ON THE JOB**



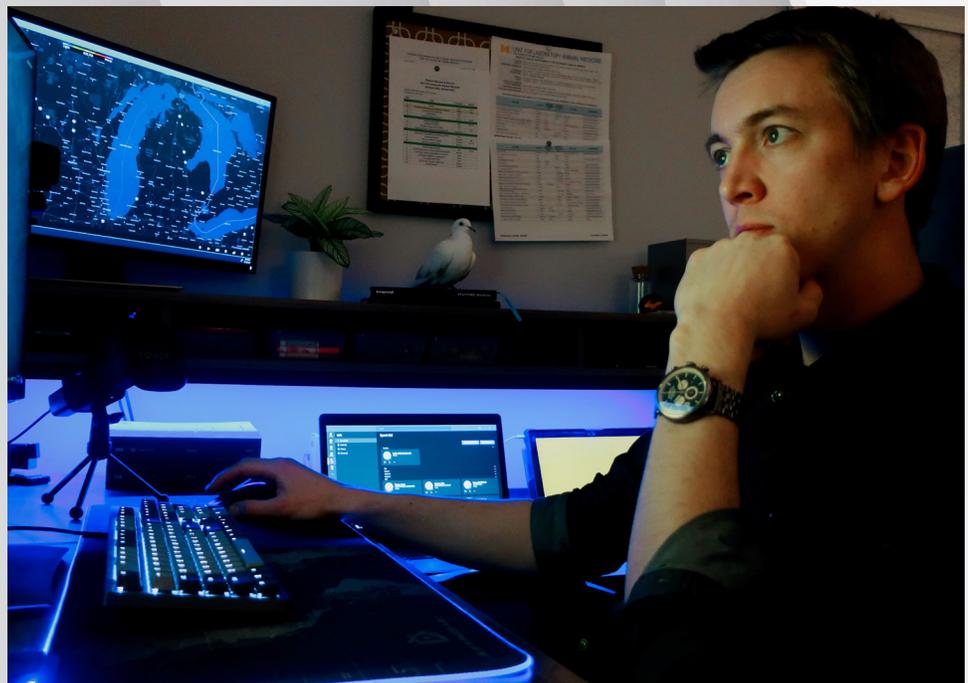
*NRC inspectors (left to right) Katherine Warner, Liz Andrews and Mark Henrion observe workers preparing and pouring concrete for a dry cask storage pad on the Three Mile Island plant site in Pennsylvania.*



*Region IV Health Physicist Linda Gersey (right) conducts radiological surveys and collects soil samples at the Sequoyah Fuels plant near Gore, Oklahoma. This site is undergoing decommissioning.*



*Jared Nadel, NRC senior resident inspector at the Oconee Nuclear Station in South Carolina, tracks outage work on a licensee-provided iPad, checks work email on his NRC tablet, reviews his latest inspection report on his home computer and keeps his NRC laptop ready for the next virtual meeting.*



*Using Microsoft Teams, Ryan Craffey, a Region III materials inspector, successfully conducts a virtual inspection, observing in real-time the licensee's preparations and assessing the effectiveness of their safety practices.*



*Chairman Christopher T. Hanson (left) observes plant operations, including a stop in the control room during his visit to the Salem and Hope Creek nuclear power plants in New Jersey.*



*NRC Senior Instructor Jeff Griffis teaches a virtual class from the agency's Technical Training Center in Chattanooga, Tennessee.*

*NRC Division Director Chris Miller observes new construction activities at Vogtle Units 3 and 4, in Georgia.*



*Nuclear Regulator Apprenticeship Network participant Hayden Page visits the plant's condenser containment system at the Sequoyah nuclear power plant in Tennessee.*





*NRC Commissioner David Wright (purple shirt) tours Arkansas Nuclear One in Russellville, Arkansas, with Entergy and NRC staff before observing a security exercise. Photo courtesy of Entergy.*



*NRC Region I Inspector Juan Ayala in Wilmington, Delaware, conducts an inspection to ensure a nuclear gauge is being properly handled and secured.*



*Region IV health physicist Rob Evans completes his inspection at the 600-acre site in Gore, Oklahoma, where the Sequoyah Fuels Corporation operated a uranium conversion facility.*



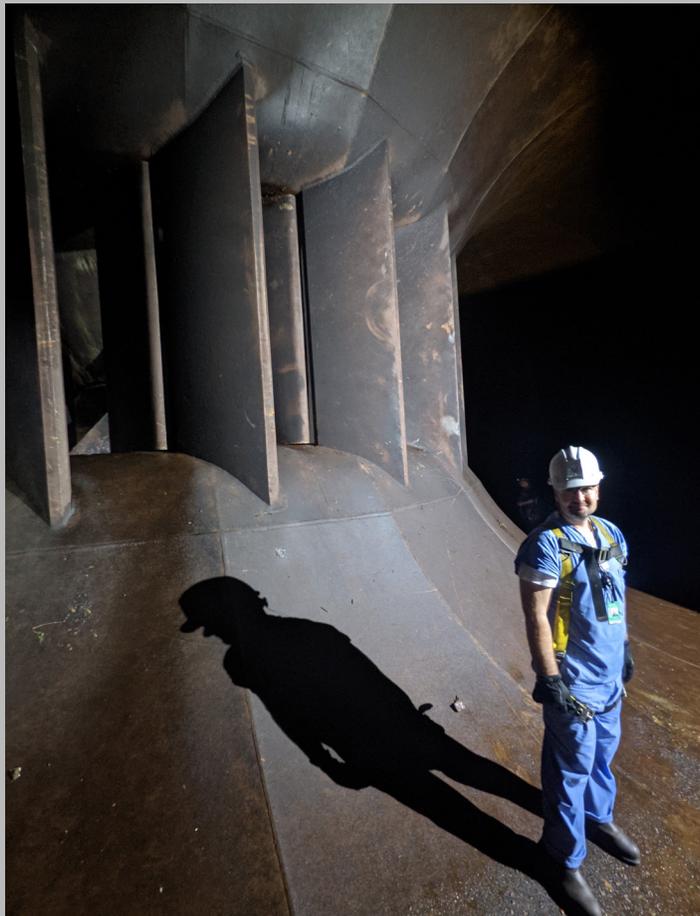
*Indian Point nuclear power plant control room operators prepare for the final insertion of control rods in the Unit 3 reactor, part of the permanent shutdown of the site in New York. Not pictured NRC inspectors watching operations.*



*The reactor vessel and vessel head arrive at the V.C. Summer site South Carolina. The parts traveled by rail from the Port of Charleston by rail and on a Schnabel car—a specialized freight car designed to carry heavy and oversized loads. Courtesy of SCANA/SCE&G.*



*NRC Office of Nuclear Reactor Regulation Director Andrea Veil observes new construction activities at Vogtle Units 3 and 4, in Georgia.*



*NRC Region II Inspector Nick Peterka pauses for a moment during an inspection of the Keowee Hydro Station near the Oconee Nuclear Station in South Carolina.*

*Edison Fernandez (left), a Region III specialist in refueling outage activities and welding, makes an unannounced inspection at the Palisades nuclear power plant to observe some emergent repair work and conduct final examinations on a nozzle weld during a refueling outage.*



*NRC staff participate in a “hybrid” incident response exercise with some staff online and others working from the Headquarters Operations Center in Rockville, Maryland.*