



**NOMINEE  
INTRODUCTORY  
INFORMATION  
November 2020**

# Table of Contents

<b>Foreword</b> .....	<b>iv</b>
<b>A. NRC Assistance to Commissioner Nominees</b> .....	<b>A-1</b>
<b>B. NRC Organizational Chart and Organizational Functions</b> .....	<b>B-1</b>
Offices Reporting Directly to the Chairman .....	B-1
Offices Reporting to the Commission .....	B-3
Advisory Committees .....	B-5
Offices Reporting to the Executive Director for Operations .....	B-7
Office of the Inspector General .....	B-14
<b>C. NRC Senior Leadership</b> .....	<b>C-1</b>
<b>D. NRC Budget and Human Resources</b> .....	<b>D-1</b>
Mission and Strategic Goals .....	D-1
Strategic Plan .....	D-1
Staffing and Resources .....	D-1
Budget Authority .....	D-2
High-Level Waste .....	D-4
Source of Funds .....	D-4
NRC No-Year Funding .....	D-4
Budget Control Points .....	D-5
Funding by Fees.....	D-5
Financial Management.....	D-6
Office of the Commission Budget .....	D-6
Commission Bi-Weekly Budget Report.....	D-6
Commission Awards.....	D-6
<b>E. Agency’s Responsibilities Under the Law – An Introduction for Nominees to the Commission</b> .....	<b>E-1</b>
Foreword .....	E-2
I. Introduction.....	E-3
A. History of the Agency.....	E-3
B. Adjudicatory Proceedings .....	E-4
II. The NRC Mission .....	E-5
A. Scope of Authority.....	E-5

B. International Responsibilities .....	E-7
C. Limits on NRC Authority .....	E-8
D. The NRC as an Independent Regulatory Agency.....	E-9
III. Organization and Functions of the Commission.....	E-10
IV. Relationship to Other Government Bodies.....	E-13
A. Executive Branch .....	E-13
1. The White House.....	E-13
2. Office of Management and Budget .....	E-13
3. Department of Energy .....	E-14
4. Department of State .....	E-16
5. Environmental Protection Agency.....	E-16
6. Department of Homeland Security.....	E-17
7. Occupational Safety & Health Administration.....	E-19
8. Department of Transportation .....	E-20
9. Department of Justice .....	E-20
a. Litigation .....	E-20
b. Criminal Investigations .....	E-21
c. Preemption Authority with Respect to Firearms .....	E-21
10. Federal Energy Regulatory Commission.....	E-22
11. Office of Government Ethics .....	E-23
12. Office of Personnel Management .....	E-24
13. Intelligence Community.....	E-24
B. State Governments .....	E-24
C. Tribal Governments .....	E-26
D. Congress.....	E-26
1. Senate Oversight Committees .....	E-27
2. House Oversight Committees .....	E-27
3. Other Relevant Committees.....	E-27
a. Appropriations .....	E-27
b. International Affairs .....	E-28
c. Research .....	E-28
d. General Government Operations.....	E-28
e. Special Subcommittees.....	E-28
<b>F. NRC's Major Recent Activities (Index on Page F1) .....</b>	<b>F-1</b>

G. Samples of Nominee Statements at Confirmation Hearings ..... G-1  
H. Samples of Responses to Post-Hearing Questions .....H-1

**Background Information**

1. [A Survivor’s Guide for Presidential Nominees \(2016\)](#)
2. [NRC Security Response, Reinforcement, and Regulation from 9/11 to Now](#)
3. [OGC Memorandum - Background Material on NRC Adjudications for the January 31, 2013, Commission Meeting on Public Participation in NRC Regulatory Decision-Making, dated 1/8/13](#)
4. [NRC Strategic Plan for Fiscal Years 2018-2022 \(NUREG-1614\)](#)
5. [NRC Agency Financial Report – FY 2019 \(NUREG-2220\)](#)
6. [Protecting Our Nation: A report of the U.S. Nuclear Regulatory Commission \(NUREG/BR-0314\)](#)
7. [NRC Independent Regulator of Nuclear Safety \(NUREG/BR-0164\)](#)
8. [NRC International Policy Statement \(79 FR 39415; July 10, 2014\)](#)
9. [Information Digest 2020-2021 Edition \(NUREG-1350\)](#)

# Foreword

This document has been compiled to provide a new nominee to the Nuclear Regulatory Commission (NRC) with introductory information on the NRC organization, resources, responsibilities, authority and powers of the Chairman and Commissioners, as well as legal constraints on those powers. This information will be kept current by the Office of the Secretary and presented to a new NRC Commission nominee upon his or her nomination as NRC Commissioner.

**Annette L. Vietti-Cook**  
**Secretary of the Commission**

# **NRC Assistance to Commissioner Nominees**

The Office of Congressional Affairs (OCA) will provide the nominee with a copy of this section upon his/her nomination to make clear the available NRC assistance that may be requested.

- During the confirmation process, OCA will, if requested by the nominee, arrange courtesy visits with appropriate Members of Congress. (See attached listing of NRC Oversight Committees).
- OCA, in coordination with the Office of the General Counsel (OGC) and the Executive Director for Operations (EDO) will arrange an overview of NRC's programs covering topics such as:
  - Current Issues of High Interest in Congress
  - Nuclear Reactor Safety
  - Nuclear Materials Safety
  - Nuclear Security
  - Nuclear Waste Safety
  - International Nuclear Safety Support
  - Corporate Management Strategies
- OCA will facilitate paperwork requested by the U.S. Senate.
- OCA will help, if requested by the nominee, with the Confirmation Hearing and review of the Nominee's prepared statement.
- OCA will coordinate, if requested by the nominee, responses to Post-Confirmation Hearing Questions.

Attachments:  
NRC Oversight Committees and Bios

# NRC Oversight Committees

## For the 116<sup>th</sup> Congress:

In the Senate, the Committee on Environment and Public Works exercises jurisdiction over domestic nuclear regulatory activities. Within the Committee, the Subcommittee on Clean Air and Nuclear Safety has been delegated responsibility for legislation and oversight related to the Nuclear Regulatory Commission.

In the House, the Committee on Energy and Commerce exercises jurisdiction over domestic nuclear regulatory activities. Within the Committee, there are two Subcommittees that have been delegated responsibility for legislation and oversight related to the NRC: the subcommittee on Energy, and the Subcommittee on Environment and Climate Change.

These Committees and their designated subcommittees have jurisdiction over authorizing legislation for the NRC and constitute the agency's principal oversight subcommittees. The Commission is obliged under the Atomic Energy Act of 1954 to keep these two subcommittees, as the successors to the Joint Committee on Atomic Energy, fully and currently informed of its activities. The Office of Congressional Affairs is the principal point of contact between the agency and Congress.

In addition to the NRC's authorizing committees, there are a number of other Congressional subcommittees having jurisdiction over some aspect of NRC activities. The most important of these are listed below by subject matter:

- (1) **Appropriations** -- The NRC's annual appropriations are included in the annual appropriations bill for energy and water development activities. This bill is prepared by the Subcommittee on Energy and Water Development of the House Appropriations Committee and the Subcommittee on Energy and Water Development of the Senate Appropriations Committee. Each year, the NRC presents its annual appropriations request to these subcommittees and, when requested, responds to specific inquiries from them. The NRC also is obliged to meet whatever reporting requirements are included in the annual appropriations bill or in the committee reports that accompany the bill. These two subcommittees are kept fully informed of major Commission actions and initiatives.
- (2) **International Affairs** -- Matters concerning the international aspects of atomic energy are under the jurisdiction of the Senate Committee on Foreign Relations and the House Committee on Foreign Affairs. In the Senate, the Committee on Homeland Security and Governmental Affairs shares responsibilities with the Committee on Foreign Relations for the organization and management of United States nuclear export policy. Accordingly, information and correspondence relating to nuclear exports and international safeguards are provided to the House Committee on Foreign Affairs and to the Senate Committees on Foreign Relations and on Homeland Security and Governmental Affairs.
- (3) **General Government Operations** -- Both the House and Senate have separate committees on government operations. These committees have limited legislative

authority (principally over government reorganizations and the creation of new government activities at all levels with a view of determining its economy and efficiency). They have the duty of receiving and examining all reports of the Government Accountability Office (GAO), as well as comments on the reports. All agency comments on GAO reports are to be transmitted to the Senate Committee on Homeland Security and Governmental Affairs and the House Committee on Oversight and Reform.

The following list reflects the memberships and addresses of the principal committees of Congress with which the NRC routinely communicates:

The Honorable John Barrasso  
Chairman, Committee on Environment and Public Works  
United States Senate  
Washington, DC 20510

cc: Senator Thomas R. Carper

The Honorable Mike Braun  
Chairman, Subcommittee on Clean Air  
and Nuclear Safety  
Committee on Environment and Public Works  
United States Senate  
Washington, DC 20510

cc: Senator Sheldon Whitehouse

The Honorable Frank Pallone, Jr.  
Chairman, Committee on Energy and Commerce  
United States House of Representatives  
Washington, DC 20515

cc: Representative Greg Walden

The Honorable Bobby L. Rush  
Chairman, Subcommittee on Energy  
Committee on Energy and Commerce  
United States House of Representatives  
Washington, DC 20515

cc: Representative Fred Upton

The Honorable Paul Tonko  
Chairman, Subcommittee on Environment  
and Climate Change  
Committee on Energy and Commerce

United States House of Representatives  
Washington, DC 20515

cc: Representative John Shimkus

The following subcommittees have frequent interface with NRC and, depending on the subject matter (appropriations, international affairs, research, etc.), should be kept informed of significant NRC actions and activities.

The Honorable Lamar Alexander  
Chairman, Subcommittee on Energy and  
Water Development  
Committee on Appropriations  
United States Senate  
Washington, DC 20510

cc: Senator Dianne Feinstein

The Honorable Marcy Kaptur  
Chairman, Subcommittee on Energy and Water Development  
Committee on Appropriations  
United States House of Representatives  
Washington, DC 20515

(Prefers to be addressed as Dear Madam Chairwoman)

cc: Representative Mike Simpson

The Honorable Lisa Murkowski  
Chairman, Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

(Prefers to be addressed as Dear Madam Chairwoman)

cc: Senator Joe Manchin

The Honorable James E. Risch  
Chairman, Committee on Foreign Relations  
United States Senate  
Washington, DC 20510

cc: Senator Robert Menendez

The Honorable Eliot Engel  
Chairman, Committee on Foreign Affairs  
United States House of Representatives  
Washington, DC 20515

cc: Representative Michael McCaul

The Honorable Ron Johnson  
Chairman, Committee on Homeland Security and  
Governmental Affairs  
United States Senate  
Washington, DC 20510

cc: Senator Gary C. Peters

The Honorable Bennie G. Thompson  
Chairman, Committee on Homeland Security  
United States House of Representatives  
Washington, DC 20515

cc: Representative Mike Rogers

The Honorable Carolyn B. Maloney  
Chairwoman, Committee on Oversight and Reform  
United States House of Representatives  
Washington, DC 20515

(Prefers to be addressed as Dear Madam Chairwoman)

cc: Representative James Comer

The Honorable Lizzie Fletcher  
Chairman, Subcommittee on Energy  
Committee on Science, Space and Technology  
United States House of Representatives  
Washington, DC 20515

cc: Representative Randy Weber

As with other official NRC communications with Congress, all correspondence with these committees is forwarded through the Office of Congressional Affairs, with the exception of matters under the purview of the Inspector General (IG). (The IG interacts directly with the committees.) NRC correspondence with these committees is signed by the Chairman, Executive Director for Operations, or the Director of Congressional Affairs.

# ENVIRONMENT & Public Works



116<sup>th</sup> Congress, 1<sup>st</sup> Session

Majority (11)

Minority (10)



# Chairman John Barrasso (R-WY)



**Plants in State:** None

**Uranium Recovery Facilities:** Ross; Willow Creek; Nichols Ranch; Moore Ranch; Lost Creek; Sweetwater; and *Smith Ranch*

**Facilities Undergoing Decommissioning:** American Nuclear Corporation; Bear Creek; Cogema Mining; ExxonMobil Highlands; Pathfinder - Lucky MC; Pathfinder - Shirley Basin; Umetco Minerals Corporation; Western Nuclear, Inc. - Split Rock

**Agreement State:** Yes (Sep 25, 2018 NRC's 38<sup>th</sup> Agreement St.)

**Committees:** Environment & Public Works – **Full Committee Chairman**; Energy & Natural Resources (National Parks; Public Lands, Forests and Mining; Water & Power); Foreign Relations; Indian Affairs

**Born:** July 21, 1952; Reading, PA

**First Elected:** 2008 (1st full term)

**Family:** Wife Bobbi; three children

**Education:** Georgetown U., B.S. 1974 (biology); M.D. 1978

**Career:** Surgeon

**Political Highlights:** Wyoming Senate 2003-07

## Notes:

- S. 512 – original sponsor of the “*Nuclear Energy Innovation and Modernization Act (NEIMA)*” which became public law on 1/14/2019

## Nuclear Topics of Interest:

- Seeks updates on NRC’s implementation of NEIMA
- Interested in the status of NRC’s MOU with the EPA
- Supports updating NRC’s fee recovery structure
- Supports completion of Yucca Mountain
- Believes the US should not be dependent on foreign imports of uranium
- Interested in the President’s nuclear fuel working group recommendations
- Supports implementing a flat fee structure for routine uranium recovery licensing actions
- Supports longer uranium recovery license durations
- Concerned that overregulation hinders nuclear innovation
- Concerned about cyber-attacks at nuclear facilities

## Letters to NRC:

- July 23, 2020 - co-signed a request to develop a broader more inclusive GEIS to establish a technology-inclusive, risk-informed, and performance-based regulatory framework for advanced reactors
- May 14, 2020 – Cosigned letter in support of efforts to develop a technology-inclusive regulatory framework for advanced nuclear reactors prior to the statutory deadline (Dec. 31, 2027) required by NEIMA
- Mar. 27, 2020 – Cosigned a request for consideration using existing authorities to temporarily defer collecting fees and charges from licensees
- Dec. 19, 2019 – Cosigned bipartisan request for a written update from NRC on the status of implementing NEIMA
- Nov. 21, 2019 – letter in support of risk-informed emergency preparedness requirements for advanced nuclear technologies
- Sept. 26, 2019 – letter requesting the NRC to update the format and content of the report on the status of NRC’s licensing activities and regulatory duties
- June 25, 2019 – co-authored a letter requesting the NRC initiate a process to develop a GEIS for the construction and operation of advanced nuclear reactors

## Sponsored legislation of Interest - 116<sup>th</sup> Congress:

- S.2917 – “*Nuclear Waste Policy Amendments Act of 2019*” (same as the Shimkus Bill in 2017). Legislation provides reforms to the nation’s nuclear waste management policy to ensure the federal government’s legal obligations to dispose of spent nuclear fuel and high-level waste are fulfilled.

# Senator James Inhofe (R-OK)



**Plants in State:** None

**Facilities Undergoing Decommissioning:** FMRI/Fansteel (Muskogee, OK); Kerr-McGee Cimarron (Oklahoma City); Sequoyah Fuels Corp. (Gore, OK) - former uranium recovery facility

**Agreement State:** Yes

**Committees:** Environment & Public Work, (Clean Air & Nuclear Safety; Superfund, Waste Management, and Regulatory Oversight; Transportation & Infrastructure); Small Business & Entrepreneurship; Intelligence; Armed Services - **Chairman**;

**Born:** Nov. 17, 1934; Des Moines, IA

**First Elected:** 1994 (4<sup>th</sup> full term)

**Family:** Wife, Kay; four children (one deceased)

**Education:** U. of Tulsa, B.A. 1973

**Military Service:** Army 1957-1958

**Career:** Real estate developer; Insurance executive, State legislator (1967-1977); Mayor of Tulsa (1978-1984); U.S. Congressman (1987-1994)

**Political Highlights:** Okla. House, 1967-69; Okla. Senate 1969-77; Republican nominee for governor 1974; Republican nominee for U.S. House 1976; Mayor of Tulsa 1978-84; defeated for re-election as Mayor of Tulsa 1984; U.S. House of Representatives 1987-94

## **Nuclear Topics of Interest:**

- Concerned with NRC's level of corporate support
- Concerned about NRC's decreasing workload and the results of Project Aim
- Concerned with reactor oversight spending despite a decline in operating reactors
- Concerned with NRC's fee recovery rule
- Opposes burden on industry from cumulative effects of regulatory actions
- Supports small modular reactor licensing
- Interested in post- 9/11 safety and security measures protecting against Fukushima related accidents
- Concerned with Cybersecurity and the foreign assignee program
- Supports NRC holding more stakeholder meetings with industry and the public
- Interested in NRC's NEIMA implementations

## **Letters:**

- Dec. 19, 2019 – co-signed bipartisan request for a written update from NRC on the status of implementing NEIMA
- Dec. 21, 2016 – joint letter requesting NRC report monthly to the Committee following the Commission's response to the stakeholder meeting recommendations
- Aug. 23, 2016 – Joint letter regarding NRC's 10 CFR Part 52; "ITAAC"
- Mar. 1, 2016 – joint letter to GAO requesting information regarding NRC's use of "Requests for Additional Information"

# Senator Shelley Moore Capito (R–WV)



**Plants in State:** None

**Agreement State:** No

**Committees:** Environment & Public Works (Clean Air & Nuclear Safety; Fisheries, Wildlife & Water; Transportation & Infrastructure - **Chairwoman**; Commerce, Science & Transportation; Appropriations (Homeland Security- **Chairwoman**; Commerce, Justice, Science, and Related Agencies; Interior, Environment, and Related Agencies; Labor, Health and Human Services, Education, and Related Agencies; Military Construction, Veterans Affairs, and Related Agencies; Transportation, Housing and Urban Development, and Related Agencies); Rules & Administration

**Born:** November 26, 1953; Glen Dale, WV

**First Elected:** 2014 (1st term)

**Family:** Husband, Charles Capito.; three children

**Education:** Duke U., B.S. 1975 (zoology); U. of Virginia, M.Ed. 1976 (counselor education)

**Career:** University system information center director; college career counselor;

**Political Highlights:** West Virginia House of Delegates (1996-2000); U.S. House of Representatives (2001-2015)

## **Nuclear topics of Interest:**

- Concerned about NRC’s existing regulations that were designed around one technology and are “not well suited for the innovations that are underway.”
- Corporate support costs appear excessive
- Interested in the status of Project Aim
- Concerned with how is the NRC working to reduce the licensing actions backlog
- Interested in how does the NRC prioritize the licensing actions it budgets for
- Concerned with NRC’s use of qualitative factors
- Interested in NRC’s use of requests for additional information, application of the Backfit Rule, and 10 CFR Part 52

## **Letters to NRC:**

- Dec. 19, 2019 – Cosigned bipartisan request for a written update from NRC on the status of implementing NEIMA
- Nov. 21, 2019 – Cosigned letter in support of risk-informed emergency preparedness requirements for advanced nuclear technologies
- Mar. 19, 2018 – Application by a Private Entity for a Nuclear Waste Disposal License

## **Legislation (116th Congress):**

- S.903 – cointroduced the “*Nuclear Energy Leadership Act*” (NELA) bi-partisan legislation to boost nuclear energy innovation

# Senator Kevin Cramer (R-ND)



**Plants in State:** None

**Agreement State:** Yes

**Committees:** Environment & Public Works (Clean Air & Nuclear Safety; Fisheries, Wildlife & Water; Transportation & Infrastructure); Veterans' Affairs; Budget; Banking, Housing and Urban Affairs; Armed Services

**Born:** Jan 21, 1961, Rolette, ND

**First Elected:** Nov 6, 2012 to serve in the House 2013 to 2019;

**Family:** Wife, Kris; 2 adult sons-Ian and Isaac; 2 adult daughters-Rachel and Annie; a nine year old son Abel

**Education:** BA Concordia College, MS in Management from University of Mary and was conferred the degree of Doctor of Leadership, honoris causa on May 4, 2013.

**Career:** University fundraiser; state economic development and finance director; state tourism director; state party official; campaign aide

**Political Highlights:** 1991 elected Chairman of the ND Republican National Committee; 1993 to 2000 served in Governor Ed Schafer's cabinet; 2000 to 2003 Executive Director of the Harold Schafer Leadership Foundation; Governor John Hoeven appointed him to Public Service Commission, and then won election to in 2004; Served again in 2010-2012

## Nuclear Topics of Interest:

- Supports an all-of-the-above energy policy
- Believes that nuclear power must remain viable to reduce carbon emissions
- Concerned about cyberattacks by foreign governments against U.S. nuclear power plants
- Supports efforts to restart Yucca Mountain
- Supports the development of advanced nuclear reactor technologies
- Believes that the lack of a long-term strategy for dealing with nuclear waste is untenable

## Cosponsored Nuclear Energy Legislation – 116<sup>th</sup> Congress:

- S.2917 – “Nuclear Waste Policy Amendments Act of 2019”
- S.903 – “Nuclear Energy Leadership Act”

## Sponsored Nuclear Energy Legislation:

- S.1134 – “Nuclear Powers America Act of 2019.” This bill would allow a tax credit for investments in qualified nuclear energy property placed in service before January 1, 2026. The credit applies to any amounts paid or incurred for refueling or other specified expenditures for a nuclear power plant for which an application for license renewal was or will be submitted to the Nuclear Regulatory Commission before January 1, 2026.

# Senator Mike Braun (R-IN)



**Plants in State:** None

**Agreement State:** No

**Complex Materials Sites Undergoing Decommissioning:**

Jefferson Proving Ground

**Committees:** Environment and Public Works (Clean Air and Nuclear Safety –*Chairman*); Budget; Agriculture, Nutrition and Forestry; Health, Education, Labor and Pensions; Special Committee on Aging

**Born:** March 24, 1954; Jasper, IN

**First Elected:** November 2018

**Family:** Wife, Maureen; four children

**Education:** Wabash College, B.A. 1976 (economics); Harvard, M.B.A. 1978

**Military Service:** None

**Career:** CEO and Founder of Meyer Distributing, 1985-2018

**Political Highlights:** Indiana House of Representatives 2014-2017

## **Nuclear Topics of Interest:**

- Supportive of nuclear power, particularly advanced reactor technologies, playing a part in the U.S.'s clean energy production goals.

## **Letters to NRC:**

- July 23, 2020 - co-signed a request to develop a broader more inclusive GEIS to establish a technology-inclusive, risk-informed, and performance-based regulatory framework for advanced reactors
- Mar. 2, 2020 – Joint Letter in support of NRC's efforts to assess and modernize the ROP Enhancement Initiative
- Dec. 19, 2019 – cosigned bipartisan request for a written update from NRC on the status of implementing NEIMA
- Sep. 26, 2019 – coauthored a letter with Chairman Barrasso requesting the NRC to update format and content of the report on the status of NRC's licensing activities and regulatory duties
- June 25, 2019 – coauthored a letter with Chairman Barrasso requesting the NRC initiate a process to develop GEIS for the construction and operation of advanced nuclear reactors

## **Recent District News:**

- Mar. 19, 2019 – Senator Braun and staff toured the research reactor at Purdue University.

## **Legislation (116<sup>th</sup> Congress):**

- S. 2315 – sponsor of the “*Whistleblower Act of 2019*”, to clarify the inclusion of federal subcontractors and subgrantees for whistleblower protection
- S.903 – cosponsor of Senator Murkowski's “*Nuclear Energy Leadership Act*”

# Senator Mike Rounds (R-SD)



**Plants in State:** None

**Uranium Recovery Facilities in State:**

Dewey-Burdock In Situ Recovery (Powertech)

**Decommissioned Facility:**

Pathfinder Nuclear Generating Station, Sioux Falls, SD

**Agreement State:** No

**Committees:** Environment & Public Works (Clean Air and Nuclear Safety; Superfund, Waste Management and Regulatory Oversight; Fisheries, Wildlife & Water; Transportation and Infrastructure); Armed Services (Cybersecurity – **Chairman**; Personnel and Strategic Forces); Banking, Housing & Urban Affairs; Veterans' Affairs

**Born:** Oct. 24, 1954; Huron, SD

**First Elected:** 2014 (1st term)

**Family:** Wife, Jean Rounds; four children

**Education:** S.D. State U., B.S. 1977 (political science)

**Career:** Insurance and Real Estate Executive; Insurance Agent; Campaign Aide

**Political Highlights:** S.D. Senate, 1991-00 (majority leader, 1995-2000); Governor, 2003-11

**Nuclear Topics of Interest:**

- Supports all forms of domestic energy
- Interested in post-Fukushima activities
- Supports cutting waste, fraud, abuse, and overregulation by federal agencies
- Concerned with trends in NRC staffing and budget
- Concerned that NRC savings and efficiencies are not fully reflected as actual decreases in the budget
- Concerned with NRC's fee recovery rule
- Concerned with cyber-hacking at nuclear facilities

# Senator Dan Sullivan (R-AK)



**Plants in State:** None

**Agreement State:** No

**Committees:** Environment & Public Works (Clean air and Nuclear Safety, Fisheries, Wildlife & Water; Transportation & Infrastructure); Veterans' Affairs; Armed Services (Airland; Readiness and Management Support – **Chairman**; Strategic Forces); Commerce, Science & Transportation (Security Subcommittee – **Chairman**; Science, Oceans, Fisheries and Weather)

**Born:** Nov. 13, 1964; Fairview Park, OH

**First Elected:** 2014 (1st term)

**Family:** Wife, Julie Fate Sullivan; three children n

**Education:** Harvard U., A.B. 1987 (economics); U. of Birmingham (England), M.A. 1988; Georgetown U., M.S.F.S. 1993, J.D. 1993

**Military Service:** Marine Corps 1993-1997; Marine Corps Reserve 1997-present

**Career:** White House aide; Lawyer; Author;

**Political Highlights:** U.S. State Dept. assistant secretary for economic and business affairs, 2006-09; Alaska AG, 2009-10; Alaska Dept. of Natural Resources Commissioner, 2010-13

## **Nuclear Topics of Interest:**

- Concerned with forcing current power reactors to pick up additional shortfalls in new reactor revenue
- Concerned about NRC's budget and FTE's despite reactor closures
- Supports continuing the highest levels of safety for new reactors

## **Cosponsored Nuclear Energy Legislation:**

- S. 903 (reintroduced) - the "*Nuclear Energy Leadership Act*" would direct the Secretary of Energy to establish advanced nuclear goals, provide for a versatile, reactor-based fast neutron source, make available high-assay, low-enriched uranium for research, development, and demonstration of advanced nuclear reactor concepts

# Senator John Boozman (R-AR)



**Facilities in State:** Arkansas Nuclear One, Units 1 & 2  
(Both in Col. 1)

**Agreement State:** Yes

**Committees:** Environment & Public Works (Clean Air & Nuclear Safety; Fisheries, Wildlife & Water; Transportation & Infrastructure); Veterans' Affairs; Appropriations (Military Construction, Veterans Affairs and Related Agencies – **Chairman**) Agriculture, Nutrition & Forestry (Commodities, Risk Management and Trade – **Chairman**); Commission on Security and Cooperation in Europe

**Born:** Dec. 10, 1950; Shreveport, LA

**Family:** Wife, Cathy; three children

**First Elected:** 2010 (2<sup>nd</sup> term)

**Education:** U. of Arkansas, attended 1969-1972; Southern College of Optometry, O.D. 1977

**Career:** Optometrist; Cattle farm owner

**Political Highlights:** Rogers Public Schools Board of Education, 1994-2001; U.S. House of Representatives, 2001-11

## **Nuclear Topics of Interest:**

- Interested in the current operating status of ANO
- Supports completion of the Yucca Mountain license application
- Interested in post-Fukushima activities
- Supports an all-of-the-above energy mix that includes nuclear
- Concerned with NRC corporate overhead costs
- Interested in how additional NRC savings can result in budget reductions
- Interested in NRC efforts to provide timely reviews and schedule transparency for licensees

## **Recent letters to NRC:**

- None

## **Note:**

- Apr. 22, 2016 – District staff to Sen. Boozman joined Former Commissioner Burns on a tour of ANO

# Senator Roger Wicker (R-MS)



**Plants in State:** Grand Gulf (Col. 1)

**Agreement State:** Yes

**Committees:** Environment & Public Works (Clean Air & Nuclear Safety; Fisheries, Wildlife & Water; Transportation & Infrastructure); Armed Services (Airland; Cyber Security; and Seapower); Commerce, Science & Transportation – **Chairman**; Commission on Security and Cooperation in Europe – **Co-chair**; Rules and Administration; Joint Committee on Printing

**Born:** July 5, 1951; Pontotoc, MS

**First Elected:** 2008 (1st term)

**Family:** Wife, Gayle Wicker; three children

**Education:** U. of Miss., B.A. 1973 (political science & journalism; J.D. 1975

**Military Service:** Air Force 1976-1980; Air Force Reserve, 1980-2004

**Career:** County public defender; Lawyer; Military prosecutor; Congressional aide

**Political Highlights:** Mississippi Senate 1988-94; U.S. House of Representatives 1995-2007

## **Nuclear Topics of Interest:**

- Interested in the operating status of Grand Gulf
- Supported the Grand Gulf license renewal (issued Dec. 1, 2016)
- Supports nuclear power as the future of clean energy
- Supports the construction of new nuclear power plants
- Concerned about cumulative impacts of existing NRC regulations
- Supports completion of Yucca Mountain
- Supports boosting the cybersecurity workforce in both the public and private sectors

## **Letters to NRC:**

- None

# Senator Richard Shelby (R-AL)



**Facilities in District:** Browns Ferry Unit 1, 2, & 3 (All Col. 1); Joseph M. Farley Unit 1 & 2 (All Col.1)

**Agreement State:** Yes

**Committees:** Environment and Public Works (Clean Air and Nuclear Safety; Fisheries, Water, and Wildlife; Transportation and Infrastructure); Appropriations – **Chairman**, (Commerce, Justice, Science and Related Agencies; Department of Defense – **Chairman**; Energy and Water Development; Homeland Security; Labor, Health and Human Services, Education and Related Agencies; Transportation, Housing and Urban Development and Related Agencies); Banking Housing and Urban Affairs (Securities, Insurance, and Investment; Financial Institutions and Consumer Protection; Housing, Transportation, and Community Development); Rules and Administration

**Born:** May 6, 1934; Birmingham, AL

**First Elected:** 1986 (6<sup>th</sup> term)

**Family:** Wife, Annette Nevin Shelby; 2 children

**Education:** U. of Alabama, A.B. 1957, LL.B. 1963

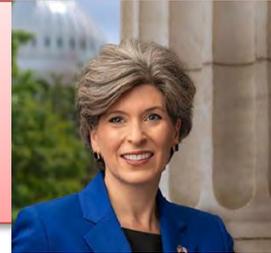
**Career:** Lawyer; city prosecutor

**Political Highlights:** Alabama Senate, 1971-79 (served as a Democrat); U.S. House of Representatives, 1979-87 (served as a Democrat)

## Specific Nuclear Topics of Interest:

- Interested in nuclear innovation
- Interested in the operating status of Browns Ferry and Farley plants
- Supports an “all-of-the-above” energy approach
- Supports energy independence and creation of more jobs
- Concerned with federal overregulation
- Interested in NRC’s NEIMA implementation

# Senator Joni Ernst (R-IA)



**Plants in State:** Duane Arnold (Col. 1)

**Agreement State:** Yes

**Committees:** Environment & Public Works (Clean Air and Nuclear Safety); Agriculture, Nutrition & Forestry; Armed Services (Emerging Threats and Capabilities – *Chairman*); Judiciary; Small Business and Entrepreneurship

**Born:** Jul. 1, 1970; Red Oak, IA

**First Elected:** 2014 (1<sup>st</sup> term)

**Family:** Husband, Gail Ernst; three children

**Education:** Iowa State U., B.A. 1992 (psychology); Columbus College, M.P.A. 1995

**Military Service:** Army Reserve 1992-2001; Iowa National Guard 2001-2015

**Career:** County emergency management office director; training program coordinator

**Political Highlights:** County auditor, 2005-11; Iowa Senate, 2011-14

## **Nuclear Topics of Interest:**

- None

## **Letters to NRC:**

- None

## **District News:**

- Apr. 4, 2019 – staff from Senator Ernst’s regional office attended the annual end of cycle open house for Duane Arnold. Staff attended last year as well
- Aug. 24, 2017 – Senator Ernst and staff toured the Duane Arnold Energy Center

## **Legislation (116<sup>th</sup> Congress):**

- S. 565 – sponsor of the “*Billion Dollar Boondoggle Act*” requiring an OMB annual report on federal projects that are over budget and behind schedule
- S. 2269 – sponsor of the “*Strategic Withdrawal of Agencies for Meaningful Placement (SWAMP) Act*”
- S. 92 – cosponsor of Sen. Paul’s “*Regulations from the Executive in Need of Scrutiny (REINS) Act*”

# Ranking Member Thomas Carper (D-DE)



**Plants in State:** None (but strong interest in Salem and Hope Creek because a large portion of EPZ is in Delaware)

**Agreement State:** No

**Committees:** Environment & Public Works – **Full Committee Ranking Member**; Finance; Homeland Security & Governmental Affairs (Permanent Subcommittee on Investigations – **Ranking Member**; Regulatory Affairs and Federal Management)

**Born:** Jan. 23, 1947; Beckley, WV

**First Elected:** 2000

**Family:** Wife, Martha Carper; two children

**Education:** Ohio State U., B.A. 1968 (economics); U. of Delaware, M.B.A. 1975

**Career:** State economic development official, 1975-1976

**Military Service:** U.S. Navy Reserve, 1973-1992; U.S. Navy, 1968-1973

**Political Highlights:** Delaware Treasurer; 1977-1983; U.S. House of Representatives, 1983-1993; Governor, 1993-2000

## Nuclear Topics of Interest:

- Questioned the proposal to reduce ISFSI inspections
- Concerned that NRC has adequate resources to recruit/retain a quality workforce
- Interested in accident tolerant fuel
- Supports nuclear energy to address climate change and replace existing fleet with advanced reactors
- Concerned about what is filling void for testing fuel since the closure of Halden Reactor
- Interested in cyber security for nuclear industry, particularly vulnerabilities of digital I&C
- Concerned that budget cuts could impact staff morale

## Letters to NRC:

- Mar. 27, 2020 – Cosigned a request for consideration using existing authorities to temporarily defer collecting fees and charges from licensees
- Dec. 19, 2019 – cosigned bipartisan request for a written update from NRC on the status of implementing NEIMA
- Apr. 1, 2019 – cosigned letter with Sen. Whitehouse concerning Commission's vote on changes to Mitigation of Beyond-Design-Basis Events rule

## Legislation (116th Congress):

- S. 1288 – cosponsor of Sen. Wyden's "*Clean Energy for America Act*" to make changes to the tax code and tax credits to make them more technology neutral

# Senator Benjamin Cardin (D-MD)



**Plants in State:** Calvert Cliffs 1 & 2 (both in Col. 1)

**Operating Research and Test Reactors:**

Armed Forces Radiobiology Research Institute;  
National Institute of Standards & Technology;  
University of Maryland

**Power Reactor Sites Undergoing Decommissioning:**

Nuclear Ship Savannah

**Agreement State:** Yes

**Committees:** **Environment & Public Works** (Clean Air & Nuclear Safety; Fisheries, Wildlife & Water; Transportation & Infrastructure – **Ranking Member**); Finance (Global Women’s Issues – **Ranking Member**); Foreign Relations; Small Business & Entrepreneurship – **Ranking Member**

**Born:** Oct. 5, 1943; Baltimore, MD

**First Elected:** 2006

**Family:** Wife, Myrna Edelman Cardin; two children (one deceased)

**Education:** U. of Pittsburgh, B.A. 1964 (economics); U. of Maryland, Baltimore, LL.B. 1967

**Career:** Lawyer

**Political Highlights:** Maryland House, 1967-1987 (speaker, 1979-1987); U.S. House of Representatives, 1987-2007

**Nuclear Topics of Interest:**

- Concerned about NRC’s ability to recruit and retain high-quality staff
- Concerned about NRC’s staffing/resources to maintain its core technical capabilities
- Wants to ensure safety takes priority over economics in regulating nuclear fleet
- Sponsored legislation providing investment tax credits to nuclear facilities to help “level the playing field” with other energy sources
- Supports nuclear energy and carbon-free electric generation

**Legislation (116th Congress):**

- S. 903 – cosponsor of Sen. Murkowski’s “*Nuclear Energy Leadership Act*”
- S. 262 – cosponsor of Sen. Van Hollen’s “*Federal Civilian Workforce Pay Raise Fairness Act of 2019*”
- S. 1288 – cosponsor of Sen. Wyden’s “*Clean Energy for America Act*” to make changes to the tax code and tax credits to make them more technology neutral

**Note:**

- Sep. 23, 2020 – Held a Town Hall for NRC employees

# Senator Bernie Sanders (I-VT)



## Facilities Undergoing Decommissioning:

Vermont Yankee

**Agreement State:** Yes

**Committees:** Environment & Public Works (Clean Air & Nuclear Safety; Fisheries, Water and Wildlife; Transportation and Infrastructure); Energy & Natural Resources (Energy; National Parks; Water and Power); Budget – **Full Committee Ranking Member**; Health, Education, Labor & Pensions (Children and Families, Primary Health and Retirement Security – **Ranking Member**); Veterans' Affairs

**Born:** Sept. 8, 1941; Brooklyn, NY

**First Elected:** 2006

**Family:** Wife, Jane O'Meara Sanders; four children  
Education: Brooklyn College, attended 1959-1960; U. of Chicago, A.B. 1964 (political science)

**Career:** College instructor, freelance writer; documentary filmmaker; carpenter

**Political Highlights:** Mayor of Burlington, 1981-1989; U.S. House of Representatives, 1991-2007, sought Democratic nomination for president in 2016 and currently running for 2020

## Nuclear Topics of Interest:

- Supports states and local communities having a “meaningful role” in decommissioning planning
- Concerned about high-density storage in spent fuel pools
- Believes the public should have a voice in license transfers of decommissioning plants

## Letters to NRC:

- Dec. 20, 2019 – Joint letter opposing staff proposal to reduce frequency and level of effort of spent fuel site inspections
- Aug. 3, 2018 – Joint letter concerning NRC’s proposed decommissioning rule and treatment of public participation, spent fuel storage, and financial and physical protections

## Cosponsored Nuclear Legislation (116<sup>th</sup>):

- S. 2854 – “*Dry Cask Storage Act*” (Sen. Markey)
- S. 1985 – “*STRANDED Act of 2019*” (Sen. Duckworth)
- S. 2236 – “*Environmental Justice Act of 2019*” (Sen. Booker)
- S. 649 – “*Nuclear Waste Informed Consent Act*” (Sen. Cortez Masto)
- S. 262 – “*Federal Civilian Workforce Pay Raise Fairness Act of 2019*” (Sen. Van Hollen)

# Senator Sheldon Whitehouse (D-RI)



**Plants in State:** None

**Operating Research and Test Reactors:**

Rhode Island Atomic Energy Commission

**Agreement State:** Yes

**Committees:** Environment & Public Works (Clean Air & Nuclear Safety – **Subcommittee Ranking Member**; Fisheries, Wildlife & Water; Transportation & Infrastructure); Budget; Judiciary (Crime and Terrorism – **Subcommittee Ranking Member**); Finance (Energy, Natural Resources, and Infrastructure)

**Born:** Oct. 20, 1955; Manhattan, NY

**First Elected:** 2006

**Family:** Wife, Sandra Whitehouse; two children

**Education:** Yale U., B.A. 1978 (architecture);  
U. of Virginia, J.D. 1982

**Career:** Lawyer

**Political Highlights:** Rhode Island Business Regulation Director, 1992-1994; U.S. attorney, 1994-1998; Rhode Island Attorney General, 1999-2003

## Nuclear Topics of Interest:

- Supports development of advanced reactors and wants NRC to have the resources required for licensing work
- Concerned about climate change/carbon pollution
- Believes financial incentives may induce solution to nuclear waste
- Fukushima lessons learned
- Concerned about cyber attacks and ways to involve private-sector companies to counter attacks

## Letters to NRC:

- May 14, 2020 – Cosigned letter in support of efforts to develop a technology-inclusive regulatory framework for advanced nuclear reactors prior to the statutory deadline (Dec. 31, 2027) required by NEIMA
- Dec. 19, 2019 – Co-signed bipartisan request for a written update from NRC on the status of implementing NEIMA
- Apr. 1, 2019 – Co-signed letter with Sen. Carper concerning Commission vote on changes to Mitigation of Beyond-Design-Basis Events rule that “backtracks” from critical safety measures on flooding and seismic hazards

## Legislation (116th Congress):

- S. 903 – cosponsor of Sen. Murkowski’s “Nuclear Energy Leadership Act”
- S. 1359 – cosponsor of Sen. Tina Smith’s “Clean Energy Standard Act of 2019”
- S. 1288 – cosponsor of Sen. Wyden’s “Clean Energy for America Act” to make changes to the tax code and tax credits to make them more

# Senator Jeff Merkley (D-OR)



**Plants in State:** None

**Operating Research and Test Reactors:**

Oregon State University; Reed College

**Complex Materials Sites Undergoing Decommissioning:**

PCC Structurals, Inc. (Milwaukie, OR); TDY Industries Inc. (Albany, OR)

**Agreement State:** Yes

**Committees:** Environment & Public Works (Clean Air & Nuclear Safety; Fisheries, Water & Wildlife;

Transportation & Infrastructure); Foreign Relations (Multilateral International Development, Multilateral Institutions, and International Economic, Energy, and Environmental Policy – **Ranking Member**); Budget; Appropriations (Energy and Water)

**Born:** Oct. 24, 1956; Myrtle Creek, OR

**First Elected:** 2008 (2<sup>nd</sup> term)

**Family:** Wife, Mary Sorteberg; two children

Education: Stanford U., B.A. 1979

(international relations); Princeton U., M.P.A. 1982

**Career:** Nonprofit executive; computer repair company owner; Congressional Budget Office Analyst;

**Political Highlights:** Oregon House 1999-2009 (minority leader, 2003-07; speaker 2007-09)

**Note:** NuScale Power is located in Corvallis, Oregon

**Nuclear Topics of Interest:**

- Supports Small Modular Reactors
- Interested in the status of NuScale's design certification application
- Believes that NuScale represents the power of American innovation
- Interested in NRC's NEIMA implementation on the advanced reactors licensing process
- Supports installation of engineered filtered venting systems to reduce the risk of radiation releases in the event of a severe accident
- Interested in implementation of post-Fukushima recommendations

**Sponsored Nuclear Energy Legislation:**

- S.Con.Res. 2 - Expressing the sense of Congress that any US-Saudi Arabia civilian nuclear cooperation agreement must prohibit the Kingdom of Saudi Arabia from enriching uranium or separating plutonium on its own territory, in keeping with the strongest possible nonproliferation "gold standard"

**Note:**

- District staff to Sen. Merkley, were tracking the *ATI Specialties Alloys & Components* – Export license application at the NRC.
  - April 17, 2018 – ATI withdrew their application to export zirconium tubes to China

# Senator Kirsten Gillibrand (D-NY)



**Plants in State:** FitzPatrick; Ginna; Indian Point Units 2 & 3; Nine Mile Point Units 1 & 2 (all in Col. 1)

**Operating Research and Test Reactors:** Rensselaer Polytechnic Institute

**Facilities Undergoing Decommissioning:** State University of New York at Buffalo; West Valley Demonstration Project; Indian Point Unit 1

**Agreement State:** Yes

**Committees:** Environment & Public Works (Clean Air & Nuclear Safety; Superfund, Waste Management & Regulatory Oversight; Transportation & Infrastructure); Armed Services (Cybersecurity; Personnel – **Ranking Member**); Special Committee on Aging; Agriculture, Nutrition & Forestry (Livestock, Marketing & Agriculture Security – **Ranking Member**)

**Born:** Dec. 9, 1966; Albany, NY

**First Elected:** 2012; Appointed 2009

**Family:** Husband, Jonathan Gillibrand; two children

**Education:** Dartmouth College, A.B. 1988 (Asian studies) U. of California, Los Angeles, J.D. 1991

**Career:** Lawyer; Special Counsel to U.S. Housing and Urban Development Department secretary

**Political Highlights:** U.S. House of Representatives, 2007-2009

## Nuclear Topics of Interest:

- Questions whether Holtec has the financial capacity to take on Indian Point in its growing decommissioning business
- Concerned about emergency planning for Indian Point
- Concerned about potential cyber attacks on nuclear plants

## Letters to NRC:

- Jan. 31, 2020 – Joint letter supporting a hearing on the license transfer application
- Jan. 21, 2020 – Joint letter requesting extension of public comment period on license transfer
- Dec. 20, 2019 – Joint letter opposing staff proposal to reduce frequency and level of effort of spent fuel site inspections
- Apr 16, 2019 – Letter requesting the NRC hold a public meeting on community advisory board best practices in Westchester, NY.
- Aug. 3, 2018 – Joint letter concerning NRC’s proposed decommissioning rule and treatment of public participation, spent fuel storage, and financial and physical protections

## Legislation (116th Congress):

- S. 2854 – cosponsor of Sen. Markey’s *“Dry Cask Storage Act”*
- S. 649 – cosponsor of Sen. Cortez Masto’s *“Nuclear Waste Informed Consent Act”*
- S. 262 – cosponsor of Sen. Van Hollen’s *“Federal Civilian Workforce Pay Raise Fairness Act of 2019”*

# Senator Cory Booker (D-NJ)



**Plants in State:** Hope Creek (Col. 1); Salem Units 1 & 2 (Col. 1)

**Facilities Undergoing Decommissioning:**

Oyster Creek; Dept. of the Army's Picatinny Arsenal

**Agreement State:** Yes

**Committees:** Environment & Public Works (Clean Air and Nuclear Safety; Superfund, Waste Management & Regulatory Oversight – **Ranking Member**; Transportation & Infrastructure); Foreign Relations; Judiciary; Small Business & Entrepreneurship

**Born:** April 27, 1969; Washington, D.C.

**First Elected:** 2013

**Family:** Single

**Education:** Stanford U., B.A. 1991 (political science), M.A. 1992 (sociology); Oxford U., B.A. 1994 (modern history; Rhodes scholar); Yale U., J.D. 1997

**Career:** Lawyer

**Political Highlights:** Newark City Council, 1998-2002; Mayor of Newark, 2006-2013

**Nuclear Topics of Interest:**

- Supports accelerating reviews of small modular/advanced reactors
- Concerned about future of NRC recruitment/staffing as nuclear plants shut down prematurely
- Concerned about NRC inspections of aging fleet

**Letters to NRC:**

- May 14, 2020 – Cosigned letter in support of efforts to develop a technology-inclusive regulatory framework for advanced nuclear reactors prior to the statutory deadline (Dec. 31, 2027) required by NEIMA
- Dec. 19, 2019 – cosigned bipartisan request for a written update from NRC on the status of implementing NEIMA

**Legislation (116<sup>th</sup> Congress):**

- S.2236 – sponsored the “*Environmental Justice Act of 2019*”
- S. 649 – cosponsor of Sen. Cortez Masto’s “*Nuclear Waste Informed Consent Act*”
- S.903 – cosponsor of Sen. Murkowski’s “*Nuclear Energy Leadership Act*”

# Senator Edward Markey (D-MA)



**Decommissioning Facilities in State:** Pilgrim

**Operating Research and Test Reactors:**

Massachusetts Institute of Technology;

University of Massachusetts/Lowell

**Agreement State:** Yes

**Committees:** **Environment & Public Works** (Clean Air & Nuclear Safety; Superfund, Waste Management & Regulatory Oversight; Transportation &

Infrastructure); Commerce, Science & Transportation (Communications, Technology, Innovation & the Internet; **Security - Ranking Member**) Foreign

Relations (East Asia, the Pacific, and International Cybersecurity Policy – **Ranking Member**); Small Business & Entrepreneurship

**Born:** July 11, 1946; Malden, MA

**First Elected:** 2013

**Family:** Wife, Susan Blumenthal

**Education:** Boston College, B.A. 1968, J.D. 1972

**Military Service:** Army Reserve (1968-1973)

**Career:** Lawyer; Mass. House, 1973-1977; U.S. House of Representatives, 1976-2013

**Political Highlights:** Massachusetts House, 1973-77; U.S. House of Representatives, 1976-2013

## **Nuclear Topics of Interest:**

- Mitigation of Beyond Design Basis Events rule
- Proposed reductions in ISFSI inspections
- U.S.- Saudi negotiations on a 123 Agreement
- Cyber threats/attacks on reactors
- Emergency planning and funding for decommissioning reactors

## **Letters to NRC:**

- Dec. 20, 2019 – Joint letter opposing NRC staff’s proposal to reduce frequency and level of effort of ISFSIs
- Aug. 21, 2019 – Joint letter urging the NRC staff to delay a decision on Pilgrim license transfer until the Commission rules on Massachusetts’ petition/motions
- Aug. 8, 2019 – Urges NRC to delay ruling on Pilgrim license transfer until Commission rules on hearing request
- July 24, 2019 – Concerns about TVA “chilled work environment”
- Mar. 4, 2019 – Joint letter on Pilgrim decommissioning funding
- Jan. 18, 2019 – Joint letter concerning NRC’s plans to issue the license amendment and renewal to Seabrook before a hearing

## **Legislation (116th Congress):**

- S. 2854 – reintroduced the “*Dry Cask Storage Act*”
- S. 3014 – a bill requiring congressional approval for civilian nuclear cooperation under certain circumstances
- S. 612 – “*Saudi Nuclear Nonproliferation Act of 2019*”
- S. 1127 – bill to ensure Congress reviews “Part 810” authorizations
- S. 1985 – cosponsor of Sen. Duckworth’s “*STRANDED Act of 2019*”

# Senator Tammy Duckworth (D-IL)



**Plants in State:** Braidwood Unit 1 & 2 (both Col. 1); Byron Unit 1 & 2 (both Col. 1); Clinton (Col. 1); Dresden Unit 2 & 3 (Col.1); La Salle County Unit 1 & 2 (both Col. 1); Quad Cities Unit 1 & 2 (both Col. 1)

**Fuel Cycle Facilities:** Honeywell Metropolis

**Facilities Undergoing Decommissioning:** ADCO Services, Inc.; Dresden (Unit 1); Honeywell; Weston Solutions (Kerr-McGee); Zion (Units 1 & 2)

**Agreement State:** Yes

**Committees:** Environment & Public Works (Clean Air & Nuclear Safety; Fisheries, Wildlife & Water –**Ranking Member**); Armed Services; Commerce, Science and Transportation; Small Business & Entrepreneurship

**Born:** Mar. 12, 1968; Bangkok, Thailand

**First Elected:** 2016 (1<sup>st</sup> term)

**Family:** Husband, Bryan Bowlsbey; two children

**Education:** U. of Hawaii, B.A. 1989 (political science); George Washington, U., M.A. 1992 (international affairs); Northern Illinois U., Ph.D program

1992-2004; Capella U., Ph.D 2015 (human services)

**Military Service:** Army Reserve 1991-1996; Illinois National Guard 1996-2014 (awarded Purple Heart)

**Career:** State veterans affairs department director

**Political Highlights:** Democratic nominee for U.S. House 2006; U.S. Veterans Affairs Department assistant secretary, 2009-11; U.S. House of Representatives, 2013-17

## **Nuclear Topics of Interest:**

- Concerned with the effectiveness of the force-on-force inspection program
- Concerned with NRC whistleblower protections, introduced legislation to amend ERA section 211
- Introduced legislation for tax credits and grants for the communities surrounding Zion for the economic loss of storing nuclear waste
- Supports development of SMRs and other advanced nuclear technologies to grow manufacturing jobs in U.S. and overcome economic challenges that current Illinois nuclear power plants face
- Interested in ensuring Argonne National Laboratory receives requested funding from Congress for development of fast reactor and fuel cycle technologies

## **Letters to NRC:**

- Dec. 19, 2019 – Cosigned bipartisan request for a written update from NRC on the status of implementing NEIMA
- Aug. 21, 2018 – ERA Section 211 NRC whistle blower protections modified by the NRC in 2017

## **Recent District News:**

- Staff recently attended and read a statement on behalf of Senator Duckworth at the NEIMA CABs lessons learned meeting held near Zion, IL

## **Legislation (116<sup>th</sup> Congress):**

- S.1985 – sponsor of the “*Sensible, Timely Relief for America’s Nuclear Districts’ Economic Development (STRANDED) Act*”
- S. 1330 – sponsor of the “*DOE and NRC Whistleblower Protection Act*”
- S. 903 – cosponsor of Senator Murkowski’s “*Nuclear Energy Leadership Act*”

# Senator Chris Van Hollen (D-MD)



**Plants in State:** Calvert Cliffs 1 & 2 (both Col. 1)

**Operating Research and Test Reactors:**

Armed Forces Radiobiology Research Institute;  
National Institute of Standards & Technology;  
University of Maryland

**Power Reactor Sites Undergoing Decommissioning:**

Nuclear Ship Savannah

**Agreement State:** Yes

**Committees:** Environment & Public Works (Fisheries, Water, and Wildlife; Transportation and Infrastructure); Appropriations; Banking, Housing, and Urban Affairs; Budget

**Born:** Jan. 10, 1959; Karachi, Pakistan

**First Elected:** 2016

**Family:** Wife, Katherine Wilkens Van Hollen; three children

**Education:** Swarthmore College, B.A. 1983 (philosophy); Harvard U., M.P.P. 1985; Georgetown U., J.D. 1990

**Political Highlights:** Md. House, 1991-95; Maryland Senate, 1995-2003; U.S. House of Representatives 2003-17

**Nuclear Topics of Interest:**

- Concerned about international safeguards for new/advanced reactors
- Proliferation risks of fuel enriched to higher levels
- Concerned about impacts of climate change
- Interested in NRC's role in 123 agreements, particularly with Saudi Arabia

**Legislation (116th Congress):**

- S. 262 – sponsor *“Federal Civilian Workforce Pay Raise Fairness Act of 2019”*
- S. 2338 – sponsor *“Preventing Nuclear Proliferation in Saudi Arabia Act of 2019”*
- S. 2714 – sponsor *“ARPA-E Reauthorization Act of 2019”*
- S. 2877 – cosponsor of Sen. Tillis’ *“Terrorism Risk Insurance Program Reauthorization Act of 2019”*
- S. 2236 – cosponsor of Sen. Booker’s *“Environmental Justice Act of 2019”*
- S. 1288 – cosponsor of Sen. Wyden’s *“Clean Energy for America Act”* to make changes to the tax code and tax credits to make them more technology neutral

# U.S. Nuclear Regulatory Commission

## The Commission

**Commissioner**



David A. Wright

**Commissioner**



Jeff Baran

**Chairman**



Kristine L. Svinicki

**Commissioner**



Annie Caputo

**Commissioner**



Christopher T. Hanson

**Executive Director,  
Advisory Committee on  
Reactor Safeguards**



Scott Moore

**Chief Administrative Judge  
(Chairman) Atomic Safety  
and Licensing Board**



E. Roy Hawkins

**Director, Office of  
Commission Appellate  
Adjudication**



Jody C. Martin

**Director, Office of  
Congressional Affairs**



Eugene Dacus

**Director, Office of  
Public Affairs**



David Castelveter

**Executive Director  
for Operations**



Margaret M. Doane

**Chief Financial  
Officer**



Cherish K. Johnson

**Inspector  
General**



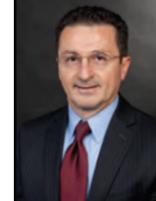
Robert J. Feitel

**General  
Counsel**



Marian Zobler

**Director, Office of  
International Programs**



Nader L. Mamish

**Secretary of the  
Commission**



Annette L. Vietti-Cook

**Director, Office of  
Small Business and  
Civil Rights**



Vonna Ordaz

**Chief Information  
Officer**



David Nelson

**Assistant for  
Operations**



Catherine Haney

**Deputy Executive Director for  
Reactor and Preparedness Programs**



Daniel H. Dorman

**Deputy Executive Director for Materials, Waste,  
Research, State, tribal, Compliance, Administration and  
Human Capital Programs**



Darrell Roberts

**Regional  
Administrator  
Region I**



David C. Lew

**Regional  
Administrator  
Region II**



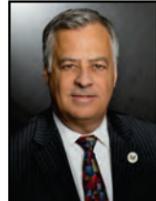
Laura Dudes

**Regional  
Administrator  
Region III**



Jack Giessner

**Regional  
Administrator  
Region IV**



Scott Morris

**Director, Office of  
Nuclear Security and  
Incident Response**



Brian E. Holian

**Director, Office of  
Nuclear Reactor  
Regulation**



Ho Nieh

**Director, Office of  
Nuclear Regulatory  
Research**



Raymond Furstenau

**Director, Office of  
Enforcement**



George A. Wilson

**Director, Office of  
Nuclear Materials  
Safety and Safeguards**



John Lubinski

**Director, Office of  
Investigations**



Andy Shuttleworth

**Director, Office of  
Administration**



Jennifer Golder

**Chief Human  
Capital Officer**



Mary Lamary

# NRC Organizational Functions

## THE FOLLOWING OFFICES REPORT DIRECTLY TO THE CHAIRMAN:

### **Executive Director for Operations (EDO)**

The position of the Executive Director for Operations (EDO) is established by statute. As the head of the NRC staff, the EDO reports to the Chairman and is subject to the Chairman's supervision and direction, as provided in Reorganization Plan No. 1 of 1980. The EDO is the chief operational and administrative officer of the Commission, and is authorized and directed to discharge such licensing, regulatory, and administrative functions of the NRC and to take actions as are necessary for day-to-day operations of the agency. The EDO supervises and coordinates policy development and operational activities of the NRC's three major statutory program offices (Nuclear Reactor Regulation, Nuclear Material Safety and Safeguards, and Nuclear Regulatory Research), as well as the NRC regional offices and Offices of Nuclear Security and Incident Response, New Reactors, Enforcement, Investigations, Human Capital, Small Business and Civil Rights, Information, and Administration.

### **Office of the Chief Financial Officer (OCFO)**

The Chief Financial Officer (CFO) position is established by the Chief Financial Officers Act of 1990, which requires the CFO to report directly to the Chairman, as head of the agency. The NRC is one of the twenty-four CFO Act agencies.

The CFO oversees all financial management activities of the NRC except for financial management activities under the control of the Inspector General. The CFO is responsible for the agency's planning, budgeting, financial management, accounting and enterprise risk management. The CFO establishes planning, budgeting, financial management, accounting, internal control and reasonable assurance policy for the agency and advises the Chairman, Commission, EDO, and agency senior management and staff on these matters.

The CFO is responsible for the development and maintenance of the agency's integrated financial management systems; provides oversight of agency financial management and internal control personnel, activities, and operations; coordinates with the agency's program managers and formulates the annual agency budget as well as the enacted appropriation annual implementation plan; prepares the agency's audited financial statements and coordinates the publication of these statements and other financial information in the Annual Financial Report (AFR) to Congress and the President; prepares and submits monthly trial balance and budget execution data to the U.S. Treasury and office of Management and Budget (OMB); submits quarterly spending data to the OMB Data Broker for public access in accordance with the Digital Accountability and Transparency Act of 2014; controls and monitors the execution of NRC's budget; provide various financial services such as payments, payroll, travel, relocation, etc.; controls and monitors the use of agency funds to ensure that they are expended in accordance with applicable laws and standards; oversees preparation and submission of the agency's quarterly budget execution reports to the Chairman and Commission; serves as the owner of the Financial Management Product Line; and conducts biennial reviews of fees and other charges imposed by the NRC for services rendered to licensees and vendors, and makes recommendations for revising those charges as appropriate. The CFO prepares and publishes through the Federal Register rulemaking process the

agency's annual fee rule, which includes a schedule of fees for annual licensing fees and fees for services to recover approximately ninety percent of NRC's budget. The OCFO prepares all financial reports of the agency.

The CFO establishes and maintains the NRC's programmatic internal control program in accordance with the Federal Managers' Financial Integrity Act of 1982 and oversees the agency's internal control over financial reporting in accordance with OMB Circular A-123, Appendix A guidelines. The OCFO works with the Office of the Executive Director for Operations in implementing the Government Performance and Results Modernization Act (GPRMA) of 2010, especially in the areas of strategic planning and performance reporting. The CFO represents the agency on the Federal CFO Council.

### **Office of Congressional Affairs (OCA)**

The Office of Congressional Affairs (OCA), which reports to the Chairman, serves as the primary contact point for all NRC communications with Congress. OCA provides advice and assistance to the Chairman, Commission, and NRC staff on all NRC relations with Congress and views of Congress toward NRC policies, plans, and activities; maintains liaison with Congressional committees and Members of Congress on matters of interest to NRC; serves as primary contact point for all NRC communications with Congress, reviews and concurs on all outgoing correspondence to Members of Congress; coordinates NRC internal activities with Congress; and monitors legislative proposals, bills, and hearings.

OCA's responsibilities also include serving as an initial point of contact for Commission interactions with other Federal agencies and external organizations, including those which represent the nuclear industry, public interest groups, and non-governmental organizations.

In addition, the NRC Protocol Office (which resides in OCA) extends hospitality to members of Congress, distinguished visitors, and other dignitaries. The office serves as a liaison between dignitaries and the Commission with respect to official visits and events.

### **Office of Public Affairs (OPA)**

The Office of Public Affairs (OPA) reports directly to the NRC Chairman. The office includes a director and senior level advisor, four headquarters-based public affairs officers and six regional public affairs officers.

The office is responsible for external communications, engaging primarily with the media in proactive outreach activities. OPA also serves as the main point of contact for media inquiries and requests for interviews. Staffers support program and regional offices by attending meetings, serving on communication plan teams, providing public affairs guidance and identifying potential media issues before they occur.

An OPA contractor provides daily media monitoring, and news clip summaries. Full texts are available each morning by 7 a.m. Eastern through the NRC intranet site and transmitted via email to select executives and employees by request. OPA staff review the media coverage for accuracy and, when appropriate, ask news organizations for corrections. OPA also, at times, submits letters to the editor or op-eds to correct or clarify news reports.

OPA staffers write, edit, and disseminate a variety of communication products intended to educate the public or media. Written products may include speeches, fact sheets and

backgrounders, and brochures. The office produces the annual Information Digest. OPA maintains and executes the agency's crisis communication strategy and tests it regularly based on exercises and "lessons learned" from real events. OPA has developed a variety of tools to employ during a crisis, including a "dark web site," a rumor control web page, an adjunct public affairs roster and pre-produced public service announcements. OPA also maintains a COOP crisis communication plan. OPA works closely with the Department of Homeland Security/FEMA on domestic incidents and with the IAEA and communication counterparts at international regulators for international events.

OPA manages the agency's social media portfolio, which includes a Twitter feed, YouTube channel, Facebook page, and Flickr photo gallery. OPA also contributes content to the agency's LinkedIn platform, which is managed by the Office of the Human Capital Officer. OPA continually assesses other social media platforms for their value to future NRC communication efforts. OPA serves as the social media expert in the agency, provides advice and guidance to offices and regions, and serves as the liaison for social media to other Federal agencies and other countries, through its leadership on the NEA's Working Group for Public Communication.

## **THE FOLLOWING OFFICES REPORT TO THE COMMISSION:**

### **Office of the General Counsel (OGC)**

The Office of the General Counsel (OGC) reports directly to the Commission. OGC advises the NRC on matters of law and legal policy, providing opinions, advice, and assistance to the agency with respect to all of its activities. Among other duties, OGC:

- interprets laws, regulations, and other sources of authority, as well as the legal form and content of proposed official actions;
- represents and advises staff offices in all programmatic activities and in administrative litigation related to licensing and enforcement;
- prepares or concurs in contractual documents, interagency agreements, delegations of authority, regulations, orders, licenses, and other legal documents, and prepares legal interpretations thereof;
- represents the NRC in administrative proceedings related to matters such as personnel, procurement, and EEO actions;
- represents the NRC in legal matters, in court proceedings, and in relation to other government agencies, administrative bodies, committees of Congress, foreign governments, and members of the public;
- monitors adjudicatory proceedings, and reviews draft Commission adjudicatory decisions in certain proceedings;
- provides legal advice to the Commission, including Commission staff, and represents the NRC in court proceedings involving the review of agency orders and rules; and
- drafts legislation proposed by the Commission and serves as the liaison with the Office of Management and Budget on legislative matters;
- reviews draft agency decisions on public petitions seeking the issuance of NRC orders or rulemaking actions.

### **Office of the Secretary of the Commission (SECY)**

The Office of the Secretary of the Commission (SECY) provides executive management services to support the Commission and to implement Commission decisions. This includes the planning and scheduling of Commission business by preparing the Commission's meeting agenda and managing the Commission's decision-making process (SECY Papers, COMs and COMSECYs); codifying Commission decisions in memoranda directing staff actions; monitoring staff compliance of pending issues and commitments; processing and control of Commission correspondence; maintaining the Commission's historical records collection; and administration of the NRC history program. SECY maintains the official adjudicatory and rulemaking dockets of the Commission and integrates automated data processing and office automation initiatives into the Commission's administrative systems. Finally, it is responsible for the implementation of the Federal Advisory Committee Act and maintains liaison with certain boards and advisory committees.

### **Office of International Programs (OIP)**

The NRC's legislatively mandated international responsibilities include adopting regulatory requirements to ensure U.S. compliance with obligations in international treaties and agreements and licensing the export and import of nuclear materials and equipment. The NRC is the U.S. licensing authority for exports and imports of nuclear materials and equipment, authorizing exports of nuclear fuel, reactor components, and radioactive sources to countries that meet statutory criteria and regulatory requirements in 10 CFR Part 110. OIP maintains close working relationships with the Executive Branch, including the Department of State, Energy, Commerce, and the National Security Council. OIP participates in meetings of the international Nuclear Suppliers Group to update mechanisms used to promote global adherence to treaties governing the safe, secure and peaceful uses of nuclear energy. NRC also engages in bilateral nuclear safety cooperation programs and assistance activities with 45 countries, the European Atomic Energy Community (Euratom), and Taiwan. The NRC actively participates in and contributes technical and regulatory expertise to multilateral fora such as the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA) and has a robust international cooperative regulatory research program.

OIP provides assistance and recommendations to the Chairman, the Commission, and NRC management and staff on international issues of significance to the NRC's mission and U.S. Government foreign policy. OIP staff monitor nuclear-related political and technical developments in the international arena and in individual countries, and coordinates NRC's technical and regulatory information exchanges. OIP provides direction and staff support to U.S. Government negotiations on nuclear treaties, conventions and cooperation agreements and other international nuclear safety, safeguards and security activities. OIP plans and develops programs, in concert with other NRC offices, to implement U.S. Government and Commission policy issues associated with NRC's bilateral and multilateral safety, safeguards, and security cooperation and regulatory assistance activities, and provides support for the NRC's program of cooperative international research. OIP obtains, evaluates, and uses pertinent information from other NRC offices and U.S. Government agencies in carrying out assigned responsibilities. It establishes and maintains working relationships with regulatory and other relevant foreign counterpart agencies and with international nuclear organizations. The Office also ensures that all international activities carried out by the Commission and staff are well coordinated internally and government wide to maintain consistency with NRC and U.S. foreign policies.

## **Office of Commission Appellate Adjudication (OCAA)**

The Office of Commission Appellate Adjudication (OCAA) is responsible for assisting the Commission in the exercise of its quasi-judicial functions, including the resolution of appeals from decisions of the Atomic Safety and Licensing Boards. OCAA is responsible for providing the Commission analyses of adjudicatory matters that may merit a Commission decision (e.g., appeals, petitions for review of initial licensing board decisions, certified questions, referred rulings, stay requests, sua sponte reviews). Such an analysis includes a discussion of options available to the Commission, and preparation of any necessary adjudicatory decisions (“CLIs”) consistent with Commission policy and guidance. OCAA consults with the Office of the General Counsel in identifying options to be presented to the Commission, as appropriate (and particularly in cases involving significant or novel legal issues), and in drafting the final decision to be proposed to the Commission. OCAA also provides adjudicatory support to the Commission when it conducts mandatory hearings.

In the performance of its duties, OCAA may request, as needed, advice from Commission adjudicatory employees (AEs). AEs support the Commission by providing additional expertise in cases involving complex scientific and technical issues. OCAA also is responsible for monitoring cases pending before the Atomic Safety and Licensing Board Panel and brings matters to the Commission’s attention, as appropriate.

## **Atomic Safety and Licensing Board Panel (ASLBP)**

The Atomic Safety and Licensing Board Panel (ASLBP) is the independent trial-level adjudicatory body of the NRC. Acting on behalf of the Commission, individual Licensing Boards conduct hearings concerning contested issues that arise in the course of licensing and enforcement proceedings regarding nuclear facilities, materials, and waste in the United States. In addition, the ASLBP conducts uncontested hearings (also known as “mandatory hearings”) when designated by the Commission. The ASLBP thus implements the NRC’s obligation to afford interested persons and those subject to agency enforcement actions with an opportunity to challenge proposed licensing and enforcement activities as required by Section 189a. of the Atomic Energy Act (AEA). These hearings, which generally are public, are conducted in accordance with the Administrative Procedure Act and the Commission’s implementing regulations, set forth at 10 C.F.R. Part 2.

A unique feature of the ASLBP is that Licensing Boards are comprised of three administrative judges consisting generally of one attorney skilled in the conduct of administrative hearings and two scientific experts in technical areas relevant to the subject matter of the dispute. This science-informed tribunal is authorized under Section 191 of the AEA. At the present time, the ASLBP is comprised of 9 full-time judges and 12 part-time judges.

## **ADVISORY COMMITTEES**

The Commission currently has several advisory committees chartered under the Federal Advisory Committee Act (FACA). This statute imposes certain requirements on advisory committees providing for advance notice of their meetings, and, unless certain exemptions under the Government in the Sunshine Act apply, holding them open to the public. The Agency implements FACA for advisory committees via its regulations in Title 10 of the Code of Federal Regulations (10 CFR) Part 7, “Advisory Committees.”

### **Advisory Committee on Reactor Safeguards (ACRS)**

The Advisory Committee on Reactor Safeguards (ACRS), NRC's only statutory committee, was established by Section 29 of the Atomic Energy Act of 1954, as amended. The Act authorizes up to fifteen members for terms of four years each and specifies that "the Committee shall review safety studies and facility license applications referred to it and shall make reports thereon, shall advise the Commission with regard to the hazards of proposed or existing reactor facilities and the adequacy of proposed reactor safety standards, and shall perform such other duties as the Commission may request."

The Commission appoints ACRS members with expertise in a range of scientific and engineering disciplines including some with reactor operational experience, and are generally drawn from academic institutions, the national laboratories, and the nuclear industry to address the safety issues of importance to the Commission. Members are sought who can provide an independent perspective on nuclear safety issues, outstanding scientific and technical ability, balanced and mature judgement, and a willingness to devote the time required to the demanding work involved. Members serve for a term of 4 years and may be reappointed to additional terms. In accordance with FACA and the requirements of 10 CFR Part 7, the Commission reviews and renews the ACRS charter every two years. The ACRS staff are led by an Executive Director.

The Committee forms issue- and topic-specific Subcommittees to provide independent safety advice to the Commission. The ACRS and NRC staff interact in accordance with the ACRS/EDO memorandum of understanding. Every year, in accordance with its bylaws, the Committee elects a Chairman, Vice-Chairman, and Member-at-large as the leadership of the ACRS. Also, the Commission conducts periodic meetings with the ACRS to discuss important issues and to exchange information.

In 1988, in order to provide focused advice on nuclear waste issues, the Commission agreed to utilize up to five of the ACRS member positions to form the Advisory Committee on Nuclear Waste (ACNW). Two of the then current ACRS members were asked to switch to the new Committee which (with additional members) provided advice to the Commission for the next twenty years. In 2008 the Commission merged the ACNW functions back into the ACRS and amended the ACRS Charter to explicitly provide for review responsibilities in radiation protection and nuclear waste and materials.

### **Advisory Committee on the Medical Uses of Isotopes (ACMUI)**

The Advisory Committee on the Medical Uses of Isotopes (ACMUI) consists of up to thirteen members of qualified physicians and scientists and other representatives of the medical community, including a patients' rights advocate representative. The ACMUI advises the Director, Division of Material Safety, Security, State, and Tribal Programs (MSST), Office of Nuclear Material Safety and Safeguards (NMSS), on policy and technical issues that arise in regulating the medical use of radioactive material for diagnosis and therapy.

### **Licensing Support Network Advisory Review Panel (LSNARP)**

NRC Rules (10 CFR Part 2, Subpart J) established procedures for the submission and management of records and documents related to the licensing of a geologic repository for the disposal of high-level radioactive waste (HLW). Included in the rule is the use of an electronic

information management system known as the Licensing Support Network (LSN) to contain all of the documents subject to discovery. The Licensing Support Network Advisory Review Panel (LSNARP), consisting of representatives of parties to the licensing of a HLW disposal facility and other interested stakeholders, provides advice to (1) the NRC on the fundamental issue of the configuration of the LSN; (2) the Secretary of the Commission on the operation and maintenance of the electronic docket established for the HLW licensing proceeding; and (3) the LSN Administrator on solutions to improve the functioning of the LSN.

When the Yucca Mountain HLW proceeding was suspended in 2011 the Atomic Safety Licensing Board directed parties to provide copies of their LSN document collections to the Office of the Secretary and the LSN was decommissioned. In 2016 the LSN document collection was loaded into an electronic library that is publicly accessible in a separate library in the agency's document management system (ADAMS).

At the most recent meeting of the LSNARP in February 2018 (a virtual meeting held at agency headquarters that included onsite and remote participation by LSNARP members and the public), the agency sought input regarding possible system configurations should the Yucca Mountain HLW proceeding be restarted. The Commission has periodically renewed the LSNARP charter, most recently in December 2018, in case the LSNARP is needed to support a reactivated HLW adjudicatory proceeding that would need to provide recommendations regarding a reconstituted LSN or other discovery database under the current or a modified Part 2 rule.

#### **THE FOLLOWING OFFICES REPORT TO THE EDO:**

##### **Office of Nuclear Reactor Regulation (NRR)**

In September 2016, the NRC Commission approved the merger of the Office of Nuclear Reactor Regulation (NRR) and the Office of New Reactors (NRO)<sup>1</sup>. The purpose of the merger was to improve internal coordination, balance workload, and provide greater flexibility to respond to a dynamic work environment. The merger officially occurred on October 13, 2019, and the resulting single office retains the name *The Office of Nuclear Reactor Regulation*.

NRR is one of the NRC's three major statutory program offices. NRR is responsible for accomplishing key components of the NRC's nuclear reactor safety mission and conducts a broad range of regulatory activities in support of the Commission's safety and security strategic goals. These activities encompass licensing, oversight, siting, rulemaking, and incident response for operating commercial nuclear power reactors, new commercial nuclear power reactors, advanced reactor technologies, and non-power production and utilization facilities. NRR collaborates with other headquarters and regional offices to accomplish the NRC mission.

There are eight divisions in NRR that cover the areas of engineering and external hazards; advanced reactors and non-power utilization facilities; risk assessment; safety systems; new and renewed licenses; reactor oversight; operating reactor licensing; and resource management and administration. Additionally, there are two other entities in the organization including the Vogtle Project Office and EMBARK Venture Studio. The Vogtle Project Office is responsible for

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<sup>1</sup> In 2006, NRC reorganized NRR to create an Office of New Reactors (NRO) to ensure effective oversight of operating nuclear power plants and prepare for the industry's interest in licensing and building new nuclear power plants in the near term.

the licensing, project management, and inspection, test, analysis, and acceptance criteria resources to support activities related to construction and startup of Vogtle Units 3 and 4. The EMBARK Venture Studio is responsible for the leadership and resource management of core teams dedicated to implementing innovation projects and activities benefiting associated NRC's Transformation Initiative that will benefit the nuclear reactor safety program as well as other business lines in the agency.

### **Office of Nuclear Material Safety and Safeguards (NMSS)**

The Office of Nuclear Material Safety and Safeguards (NMSS) is one of the NRC's three statutory program offices. It covers several programs, including the nuclear fuel cycle from uranium recovery through uranium conversion and enrichment, fuel fabrication, and ultimately the storage, transportation and disposal of spent fuel and other high-level wastes. NMSS also regulates the decommissioning of power reactors and complex materials facilities, the transportation of radioactive materials, and the disposal of low-level radioactive waste.

NMSS licenses and regulates the use of radioactive materials ("byproduct material") in industry, medicine and research. It does this in cooperation with the NRC's 39 Agreement States, which regulate these materials through agreements with the NRC under the Atomic Energy Act. NMSS reviews Agreement State programs to ensure their regulatory activities meet NRC requirements.

NMSS' regulatory program includes licensing, inspection, assessment of licensee performance, analysis of events, enforcement, and identification and resolution of generic issues, as well as material control and accountability, international safeguards, and safeguards for export/import of special nuclear material.

NMSS leads, manages, and facilitates rulemaking, environmental, and financial assessment activities for: a) new, advanced, and operating power reactors, as well as non-power utilization facilities; b) nuclear materials, including production of nuclear fuel used in commercial nuclear reactors, as well as storage, transportation, and disposal of high-level radioactive waste and spent nuclear fuel; c) facilities (reactor and materials) undergoing decommissioning; and (d) transportation of radioactive materials. The division also develops and implements agency-wide policies, procedures, and program management for the NRC's rulemaking and petition for rulemaking activities, and provides support for all technical, financial, legal, and administrative rules.

NMSS conducts environmental reviews under the National Environmental Policy Act, the Endangered Species Act, the National Historic Preservation Act, as well as various other related acts in support of its licensing and regulatory functions. NMSS implements 10 CFR Part 51 and other applicable laws and policies; and coordinates with other Federal, State, and Tribal agencies in developing and finalizing Environmental Impact Statements and Environmental Assessments.

NMSS also leads, manages, and performs financial assurance reviews of agency licensing actions, and has responsibility for four financial areas: (1) financial qualifications, (2) indemnity insurance requirements, (3) change of control reviews, and (4) decommissioning funding evaluations. Including providing support to the Regional material licensing organizations, which perform their own financial reviews.

NMSS oversees safety and security liaison activities between NRC and the Agreement States, coordinating with NSIR on the necessary contingency planning and emergency response operations associated with source, byproduct, and special nuclear material.

The office also conducts performance analyses and reviews using risk informed approaches for non-routine and complex cases to demonstrate compliance with regulatory standards for the Decommissioning and Low Level Waste programs, as well as DOE incidental waste determinations and other programs as practicable.

### **Office of Nuclear Regulatory Research (RES)**

The Office of Nuclear Regulatory Research (RES) is one of the NRC's three statutory program offices. RES staff recommend and implement confirmatory research programs to aid the agency in responding to existing or near-term nuclear safety and security issues. RES also conducts forward-looking research to develop a better understanding of evolving technologies or issues that may become future regulatory concerns. It coordinates research activities with the regulatory program offices and coordinates the development of consensus and voluntary standards for agency use, including appointment of staff to committees and conferences.

Based on research results and experience gained, the office resolves ongoing and potential safety, security and radiation protection issues for nuclear power plants and other facilities regulated by the NRC. It conducts research to reduce uncertainties in areas of potentially high safety or security significance. The office leads the agency initiative for cooperative research with DOE and other Federal agencies, the domestic nuclear industry, U.S. universities, and international partners. The office manages research activities contracted to DOE laboratories, commercial firms and universities. It maintains technical capabilities for developing information for resolution of nuclear safety and security issues and provides technical support and consultation to the program offices in specialized disciplines.

RES coordinates and develops the issuance of regulatory guidance in conjunction with rulemaking and standards development. The regulatory guidance is for public use and provides approaches that the staff consider acceptable for use in implementing the agency's regulations. The guidance is used by the NRC staff and the nuclear industry to assist in reaching a common understanding of the staff's expectations.

### **Office of Nuclear Security and Incident Response (NSIR)**

The Office of Nuclear Security and Incident Response (NSIR) was established on April 7, 2002, to improve communications and coordination both within and external to the NRC on security, safeguards, emergency preparedness, and incident response. NSIR develops overall agency policy and provides management direction for evaluating and assessing technical issues involving security and emergency preparedness at domestic commercial nuclear material and waste facilities and for radioactive material in transit. The office conducts and directs the agency's program for response to incidents.

NSIR plans, coordinates, and manages agency-wide activities related to cyber security at NRC-licensed facilities, including rulemaking, licensing, policy analysis, and provision of guidance and oversight related to cyber security requirements for power reactors. NSIR staff conduct technical reviews of licensee cyber security plans and adherence to regulations and develop review plans to establish standards and ensure consistency in the review of licensing

applications. The office works closely with other federal agencies, including other independent regulatory agencies and nongovernmental entities, to investigate cyber incidents, share best practices, reduce burdens, and address potential issues in this rapidly-evolving field.

The office directs implementation of programs for security of NRC-licensed nuclear facilities and material. The NSIR staff perform a number of related functions, including liaison with intelligence and law enforcement agencies on threat issues, evaluation of the effectiveness of licensee security programs, and ensuring the protection of classified and sensitive unclassified information at NRC facilities, NRC contractors, licensees, and certificate holders. The office oversees the implementation of programs related to trustworthiness and reliability (including access authorization and fitness for duty at licensed facilities), and enforcement and allegations programs for security, and oversees the development of security policy, guidance, and licensing activities for NRC licensees.

NSIR develops and oversees the NRC program for performance-based evaluations of licensee security programs to assess the effectiveness of such programs, including force-on-force (FOF) exercises and tabletop drills. NSIR acquires and manages resources to maximize, to the extent practicable, the effective simulation of security threats in FOF exercises. The office also incorporates lessons learned into ongoing programs to identify needed improvements to ensure licensee security programs are effective.

The NSIR staff develop emergency preparedness policies, regulations, programs, and guidelines for both currently licensed nuclear reactors and potential new nuclear reactors. The staff provide technical expertise regarding emergency preparedness issues and interpretations, conduct technical and regulatory reviews of emergency preparedness license activities and maintain liaison with Federal response and law enforcement agencies.

The staff maintain around-the-clock operations of the NRC Headquarters Operations Center, ensuring that a cadre of experts is on call to respond to emergencies, oversee licensee incident response activities, and provide support to State and local response under the National Response Plan. The Incident Response Program provides communication capability among Incident Response Centers in the regional offices, and coordination with other Federal agencies. The Commission plays a critical role in incident response activities through oversight and implementation of statutory actions for protection of public health and safety, and protection of the environment.

The office is the NRC's primary interface on security, emergency preparedness and incident response with the National Security Council, the Federal Bureau of Investigation, the Department of Energy, and the Federal Emergency Management Agency. The NSIR staff contribute to international security and emergency response efforts, through bilateral and multilateral exchanges, such as training courses, participation in development of International Atomic Energy Agency guidance, and discussions with other countries' nuclear regulatory authorities.

### **Office of the Chief Information Officer (OCIO)**

The Office of the Chief Information Officer (OCIO) provides the agency's information technology (IT) infrastructure; support of IT investments and applications; and services related to the storage, retrieval, protection and preservation of NRC information in paper and electronic media. The Chief Information Officer (Director for OCIO) reports directly to the Executive

Director for Operations. OCIO is responsible for developing IT and information management policy for the Commission. This includes responsibility for the policy and handling of Sensitive Unclassified Non-Safeguards Information (SUNSI) and NRC's implementation of the Controlled Unclassified Information (CUI) program. The office provides oversight, advice, and support in the areas of information and records management, business process improvement, systems development, and enterprise architecture. The office also provides electronic information-sharing through the web, internal networks, mobile devices, workstations, network printers, and e-mail. The office oversees the agencywide IT/IM budget planning, governance structure, portfolio risk management, data center consolidation planning and execution, and reporting progress and metrics to OMB. OCIO advances the achievement of NRC's mission by understanding how technology can improve performance and facilitate process transmission.

The Chief Information Security Officer (CISO) serves as the focal point for agency-wide IT security efforts. The CISO reports to the CIO and fulfills the Federal Information Security Management Act's requirement for a Senior Agency Information Security Officer. The CISO is responsible for implementing the NRC computer security program, while ensuring appropriate, effective, and efficient NRC-wide integration, direction, and coordination of IT security planning and performance relative to the IT security program and with related IT activities. The CISO serves as an agency liaison with external entities on mutual IT security interests and proposes and successfully advocates appropriate agency-level IT security guidelines. The CISO guides IT security process maturity within the NRC and advocates these concepts to NRC organizations, while adjusting as appropriate in response to the evolving threat environment.

### **Office of Enforcement (OE)**

The Office of Enforcement (OE) is responsible for managing the Commission's Enforcement Program, the Center of Expertise (COE) for the Allegation Program, as well as the Differing Views Program and safety culture-related activities. The Director of OE reports directly to the Deputy Executive Director for Materials, Waste, Research, State, Tribal, Compliance, Administration, and Human Capital Programs. The NRC's Enforcement Program was developed to support the NRC's overall safety mission. Consistent with that mission, enforcement actions are intended to emphasize the importance of compliance with regulatory requirements and to encourage prompt identification and prompt, comprehensive correction of violations. A significant element of the enforcement program is OE's Alternative Dispute Resolution (ADR) Program, which uses mediation. ADR emphasizes creative, cooperative approaches to handling enforcement issues involving discrimination, willfulness, and civil penalties, potentially in lieu of the more traditional enforcement process, which may include litigation.

The agency's Allegation Program administers the assessment of safety concerns received by the NRC from outside sources. The NRC encourages licensees to create an environment for raising concerns without fear of retaliation and workers at regulated nuclear facilities to take technical safety concerns to their own management first. However, workers can bring safety concerns directly to the NRC at any time, and the agency is responsible for responding to those concerns in a timely and effective manner. The Allegation COE in OE includes the Agency Allegation Advisor who develops policies related to licensees' environments for raising concerns and NRC staff allegation assessment, oversees the implementation of the Allegation Program, and provides guidance to the regional and headquarters offices, as well as a team of allegation coordinators who serves as the administrative points of contact for processing and tracking allegations assigned to headquarters offices.

OE is responsible for the Safety Culture Policy Statement, which sets forth the Commission's expectation that all licensees establish and maintain a positive safety culture. The Commission directed staff to provide outreach and education to our licensees on the policy statement. This includes providing safety culture presentations at a variety of industry conferences and meetings and developing educational tools and customizable safety culture materials. OE coordinates all safety culture oversight activities for the program offices, including supporting their safety culture activities as well as participating in safety culture inspections and assessments. OE also participates in expert, technical and consultancy meetings at IAEA and other international organizations to develop documents and share information on safety culture. The Differing Views Program develops, implements, and assesses the agency's Non-Concurrence Process (NCP) and Differing Professional Opinion (DPO) Program. The differing views team provides authoritative consultation, guidance, and assistance to all NRC employees on these processes and other ways to raise concerns to foster a healthy environment for raising concerns that supports informed decision-making across all offices.

### **Office of Investigations (OI)**

The Office of Investigations (OI) was created in 1982 as a Commission-level office independent of the EDO and the NRC staff. In 1988, pursuant to a Congressional directive, the Commission placed OI under the EDO in order to "consolidate its inspection and examinations organizations under the Executive Director in order to assure more efficient and cost-effective utilizations of staff resources."

The Director of OI reports directly to the Deputy Executive Director for Materials, Waste, Research, State, Tribal, Compliance, Administration, and Human Capital Programs. OI has a field office in each region. OI staff develop policy, procedures, and quality control standards for investigations of licensees or certificate holders, applicants, their contractors or vendors, including conducting independent investigations of all allegations of wrongdoing by other than NRC employees and contractors. In accordance with a Memorandum of Understanding between the NRC and the Department of Justice (DOJ), OI makes referrals of substantiated criminal cases to the DOJ for prosecution consideration. OI staff plan, coordinate, direct, and execute administrative affairs of the office, including the development and maintenance of a management information system. The office maintains current awareness of inquiries and formal investigations; keeps Commission principals currently informed of matters under investigation as they affect public health and safety as well as security matters; and coordinates liaison with other agencies and organizations to ensure the timely exchange of information of mutual interest

### **Office of the Chief Human Capital Officer (OCHCO)**

The Office of the Chief Human Capital Officer (OCHCO) provides leadership, guidance, and support to NRC staff and management in attracting, developing, and retaining a high-performing, diverse, and agile workforce in support of the agency's mission. OCHCO leads in the development and execution of the agency's strategic human capital initiatives and develops and implements the Human Capital Operating Plan and its performance plans consistent with agency-wide programmatic goals and objectives. OCHCO also assists and advises NRC management in the planning and implementation of human capital goals consistent with agency policies and mission. OCHCO oversees and implements NRC policies, programs, and services to provide employment services, training, employee and labor relations, organizational development, and workforce analytics. OCHCO administers the NRC work life services and

programs, including oversight of the workers' compensation and employee assistance program, the health unit, and fitness center. OCHCO provides advice and support for the planning, development, implementation, oversight, and evaluation of HR information systems. Lastly OCHCO conducts formulation, justification, and execution activities for the agency human capital management and training budgets.

The NRC maintains two state-of-the-art training facilities: The Professional Development Center (PDC) within Headquarters and the Technical Training Center in Chattanooga, TN (TTC). Most training courses in management, leadership, program development, computer skills, business skills, and technical training courses not requiring specialized equipment (e.g. reactor control room simulators) are conducted at the PDC. The TTC provides training in the areas of reactor technology, probabilistic risk assessment, radiation protection, engineering support, safeguards, fuel cycle, and regulatory skills to provide the necessary technical and regulatory foundation to support staff activities and decisions. Training is provided for inspectors, license reviewers, operations center duty officers, licensing project managers, technical reviewers, reactor technology instructors, and other NRC staff. Lessons learned from the Three Mile Island accident made the full-scope simulators an integral part of the infrastructure at the TTC. These learning tools continue to be of great value today.

### **Office of Small Business and Civil Rights (SBCR)**

The Office of Small Business and Civil Rights (SBCR) generates and oversees an on-going affirmative employment and diversity management process designed to ensure equal employment opportunity for all NRC employees and applicants for employment. SBCR also provides prompt, fair and impartial processing of discrimination complaints filed under applicable civil rights statutes and changes procedures or practices that give rise to valid complaints. In addition, SBCR oversees the NRC's Small Business Program to ensure small businesses have a full and fair opportunity to participate in NRC procurement.

SBCR comprises several programs that: implement civil rights provisions to provide for prompt, fair and impartial processing of discrimination complaints; provides affirmative employment and diversity management monitoring and implement strategies to support equal opportunity and a positive work environment; implements compliance coordination to regulate and enforce civil rights statutes and NRC regulations ensuring no one is excluded from participation in, denied benefits of, otherwise subjected to discrimination under all NRC programs and activities; implements the White House education initiatives and provisions of the Energy Policy Act of 2005, so that Minority Serving Institutions (MSIs) such as Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions and Tribal Colleges and Universities, and students and faculty of MSIs have meaningful and equal access to appropriate NRC conducted and financially assisted programs and activities; provides limited English proficiency (LEP) domestic translation services that include written translations, on-site and telephone interpretations, and reproduction of various forms of media; ensures small, disadvantaged, 8(a), women-owned, HUBZone, and service-disabled veteran-owned small business participation in NRC procurement activities.

### **Office of Administration (ADM)**

The Office of Administration (ADM) reports to the Deputy Executive Director for Materials, Waste, Research, State, Tribal, Compliance, Administration, and Human Capital Programs. ADM provides centralized services in the areas of procurement, strategic acquisition planning,

facilities management, personnel and physical-security, space planning, and a wide range of administrative services, including agency management directives support, agency-wide announcements, transportation, parking, , audiovisual, graphic design, technical editing, printing and duplicating services, food services, mail distribution, purchase cards, recycling program, and property management.

### **Regional Offices**

NRC's four Regional Offices are located in the Philadelphia (Region I), Atlanta (Region II), Chicago (Region III), and Dallas (Region IV) areas. Approximately 27% of the agency's personnel are stationed in the Regions and at resident/remote sites. Each Regional Office is headed by a Regional Administrator, appointed by the Executive Director for Operations, who is responsible for executing established NRC policies and assigned programs relating to inspection, enforcement, licensing, State agreements reviews, State liaison, and emergency response within the Region's boundaries.

For regionalized programs, the Regional offices perform an implementation function for a corresponding Headquarters program office. Included among the responsibilities of Regional Offices are the inspection and evaluation of engineering, construction, and operational activities of power reactors; implementation of nuclear material safety, licensing and inspection, emergency preparedness, and safeguards licensing functions assigned to the Region; coordination of the NRC's Incident Response Program for activities within the Region; testing and provision of licenses to operators; issuance of notices of violation and proposed civil penalties (subject to further approval of Headquarters, depending on severity); review of Agreement State regulatory programs; and provision of technical assistance to Agreement States in carrying out their regulatory programs. The regional offices also provide alternate infrastructure capability for certain types of disruptions in the National Capital Area.

The NRC has an organizational unit in its Region II office in Atlanta, headed by the Deputy Regional Administrator for Construction, to focus on the Construction Inspection Program. The Commission has assigned to this program responsibility for all new nuclear plant construction inspection activities from early site preparation and quality assurance work through construction. All construction and operational safety inspection activities for the fuel cycle facilities, nationwide, are also currently assigned to Region II.

### **THE FOLLOWING OFFICE IS UNDER THE GENERAL SUPERVISION OF THE CHAIRMAN**

#### **Office of the Inspector General (OIG)**

The U.S. Nuclear Regulatory Commission (NRC), Office of the Inspector General (OIG), was established in 1989 pursuant to the 1988 amendments to the Inspector General Act of 1978, (IG Act), 5 U.S.C. App 3, as an independent and objective entity within the agency. The NRC Inspector General (IG) is appointed by the President, by and with the advice and consent of the Senate and without regard to political affiliation.

#### **Supervision**

The IG supervises the OIG, and, though the IG reports to and is under the general supervision of the NRC Chairman, the IG retains independent personnel, contracting, and budget authority.

The IG also has independent authority to direct and conduct audits, investigations, and evaluations.

## **Functions**

The NRC's OIG was established as an independent and objective unit to:

- conduct and supervise audits and investigations relating to agency programs and operations;
- recommend policies for agency programs and operations that are designed to promote economy, efficiency, and effectiveness in their administration and to prevent and detect fraud, waste, and abuse; and
- keep the Chairman and Congress fully and currently informed about agency problems and deficiencies relating to the administration of such programs and operations and the necessity for and progress of corrective actions.

In addition, the Consolidated Appropriations Act, 2014 (P.L. 113-76) permanently authorizes the NRC IG to execute the duties and responsibilities in the Inspector General Act of 1978 with respect to the Defense Nuclear Facilities Safety Board (DNFSB). Funds for DNFSB-related activities are separately appropriated to OIG annually.

## **Authority of the Inspector General**

Pursuant to the IG Act, the IG is required to keep the NRC Chairman and Congress fully and currently informed about problems and deficiencies relating to the administration of these programs and operations. This is done primarily through the preparation of reports of individual audits and investigations, as well as periodic reports of activities, the most important of which is the Semi-annual Report to Congress from the IG as required by the IG Act. The IG regularly updates the Chairman and Commissioners on activities and will meet with individual members of Congress and provide testimony before Congressional Committees as requested. The IG also prepares an Annual Plan to inform the Commission and Congress about audit and investigative strategies and associated summaries of the specific work planned for the coming fiscal year.

In carrying out its activities, the OIG is authorized by the IG Act and other legislation to:

- Access all records, reports, audits, reviews, documents, papers, electronic media, recommendations, or other material available to NRC that relate to programs and operations.
- Receive and investigate complaints or information concerning the existence of an activity constituting a violation of law, rules, regulations, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to the public health and safety.
- Request information or assistance as necessary from Federal, State, or local government agencies to carry out the duties of OIG.
- Select and appoint investigators, auditors, technical experts, and other support employees as necessary to carry out OIG functions, powers, and duties.
- Enter into contracts and other arrangements for audits, evaluations, studies, analyses, and other services with public agencies and with private persons or corporations, and to make payments as necessary to carry out the duties of the IG Act.

Two main work units carry out the day-to-day general functions of the OIG—Audits and Investigations. The staff of each unit is headed by an Assistant Inspector General, each of whom is a member of the Senior Executive Service.

Major audit functions carried out by the OIG include:

- Financial audits, including the financial statement audit required by the Chief Financial Officers Act of 1990 (P. L. 101-576), that attest to the reasonableness of NRC's financial statements and report on financial programs.
- Performance audits that focus on NRC administrative and program operations and evaluates the effectiveness and efficiency with which managerial responsibilities are carried out, including whether the programs achieve intended results.
- Contract audits to evaluate the costs of goods and services procured by NRC from commercial enterprises.
- Evaluation reports that present OIG perspectives or information on a specific topic.
- An annual report on the most serious management and performance challenges facing the agency in accordance with the Reports Consolidation Act of 2000 (P.L. 106-531).

Audits monitors specific issue areas by assigning staff to maintain current knowledge about the agency's mission and the programs and activities used to carry out that mission as part of its audit planning activities. It also maintains an audit follow-up system that monitors NRC progress in carrying out corrective actions recommended in audit and evaluation reports.

Major investigative functions carried out by the OIG include:

- Matters relating to NRC programs and operations, including allegations of fraud, waste, and abuse.
- Review of information required by subpoena, including documents, reports, answers, records, accounts, papers, and other data and documentary evidence necessary to perform duties under the IG Act and in the possession of any entity or individual other than a Federal government agency.
- Administering or taking from any person an oath, affirmation, or affidavit when necessary to perform the functions of the OIG.
- Appointment and supervision of 1811-series criminal investigators who are authorized to carry a firearm, make an arrest without a warrant, and seek and execute warrants for arrest, search, or seizure of evidence.
- Investigation of alleged misconduct by NRC employees, management, and contractors; alleged violations of law, rules or regulations; mismanagement; or a substantial and specific danger to the public health and safety.
- Event inquiries that examine events or agency regulatory actions and identifies staff actions that may have contributed to the occurrence of an event.
- Management Implication Reports that provide "root cause" analyses about how particular problems developed.

Investigations also administers a Hotline Program on 1-800-233-3497, TDD/TTY 711 or 1-800-201-7165, or online at <https://www.nrc.gov/insp-gen/oighotline.html>, so NRC employees, contractors, and members of the public may report suspicious activity concerning fraud, waste, abuse; contractor, employee, or management misconduct; mismanagement of agency programs; or danger to public health and safety. Investigations works cooperatively with the Department of Justice (DOJ) by sharing evidence of suspected criminal violations resulting from OIG investigations and assisting DOJ in criminal prosecutions resulting from OIG investigations.

Other functions carried out by the OIG include:

- Reviewing existing and proposed legislation, regulations, directives, and policy issues for their impact on the economy, efficiency and effectiveness, or the prevention and detection of fraud, waste, and abuse in the administration of NRC programs and operations.
- Maintaining liaison with other IG organizations, law enforcement agencies, NRC Headquarters and regional offices and sites, other Federal and local officials, and the public on all matters relating to the promotion of the economy, efficiency, and effectiveness, and the detection of fraud, waste, and abuse in NRC programs and operations.
- Exercising independent authority to release or withhold documents requested under the Freedom of Information Act and Privacy Act.
- Designating, pursuant to the Whistleblower Protection Enhancement Act of 2012, (P.L. 112-199) (WPEA), as amended, a Whistleblower Protection Coordinator (WPC) to educate agency employees about prohibitions on retaliation for protected disclosures and rights and remedies against such retaliation. The NRC IG has designated the General Counsel to the IG, as the NRC WPC. The WPC can be reached at [whistleblower\\_coordinator@nrc.gov](mailto:whistleblower_coordinator@nrc.gov) or 301-415-1146.
- Performing other functions under the IG Act of 1978, as amended.

# NRC Senior Leadership

## Commissioners

Kristine L. Svinicki, Chairman  
Jeff Baran, Commissioner  
Annie Caputo, Commissioner  
David A. Wright, Commissioner  
Christopher T. Hanson, Commissioner

## Office Directors

Marian Zobler, General Counsel (OGC)

Margaret Doane, Executive Director for Operations (EDO)

Cherish Johnson, Chief Financial Officer (CFO)

Eugene Dacus, Director, Office of Congressional Affairs (OCA)

David Castelveter, Director, Office of Public Affairs (OPA)

Annette Vietti-Cook, Secretary of the Commission (SECY)

Nader Mamish, Director of International Programs (OIP)

Jody Martin, Director, Office of Commission Appellate Adjudication (OCAA)

Roy Hawkens, Chief Administrative Judge, Atomic Safety and Licensing Board Panel (ASLBP)

Scott Moore, Executive Director, Advisory Committee on Reactor Safeguards (ACRS)

Dan Dorman, Deputy Executive Director for Reactor and Preparedness Programs (DEDR)

Darrell Roberts, Deputy Executive Director for Materials, Waste, Research, State, Tribal, Compliance, Administration, and Human Capital Programs (DEDM)

Catherine Haney, Assistant for Operations

Ho Nieh, Director, Office of Nuclear Reactor Regulation (NRR)

John Lubinski, Director, Office of Nuclear Material Safety and Safeguards (NMSS)

Raymond Furstenau, Director Office of Nuclear Regulatory Research (RES)

Brian Holian, Director, Office of Nuclear Security and Incident Response (NSIR)

George Wilson, Director, Office of Enforcement (OE)

Edward (Andy) Shuttleworth, Director, Office of Investigations (OI)

Mary Lamary, Chief Human Capital Officer (OCHCO)

David Nelson, Chief Information Officer (CIO)

Jennifer Golder, Director, Office of Administration (ADM)

Vonna Ordaz, Director, Office of Small Business and Civil Rights (SBCR)

Regional Administrators:

David Lew, Administrator, Region I

Laura Dudes, Administrator, Region II

Robert Giessner, Administrator, Region III

Scott Morris, Administrator, Region IV

Robert Feitel, Deputy Inspector General (OIG)

# NRC Budget and Human Resources

## Mission and Strategic Goals

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

Agency strategic goals:

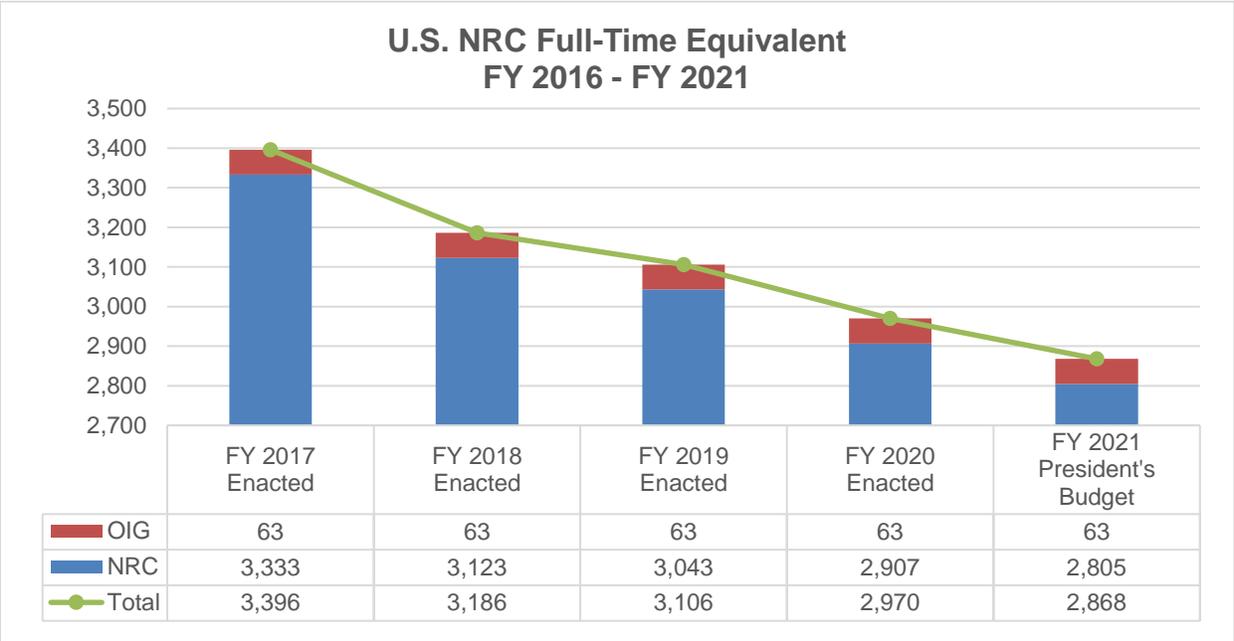
- **Safety:** Ensure the safe use of radioactive materials.
- **Security:** Ensure the secure use of radioactive materials.

## Strategic Plan

The GPRA Modernization Act of 2010 (GPRAMA) changed the strategic plan requirements for Federal agencies. The GPRAMA aligns the Strategic Plan schedule with presidential terms. All Federal agencies are now required to develop and submit to Congress a strategic plan in February of the year following the Presidential inauguration. The plan will cover a period no less than four years, but agencies can adjust the plans that reflect significant changes in the operating environment. Agencies are also required to consult with Congress every two years to ensure that the strategic plan is in alignment with Congressional objectives. The strategic plan sets the overall direction for the agency. The NRC's existing FY 2018–FY 2022 Strategic Plan (NUREG-1614, Vol. 7) was published in February 2018. The Office of the Executive Director for Operations along with the Office of the Chief Financial Officer (OCFO) will update the strategic plan for FY 2022–FY 2026. The OCFO will submit the plan to Congress in early calendar year 2022.

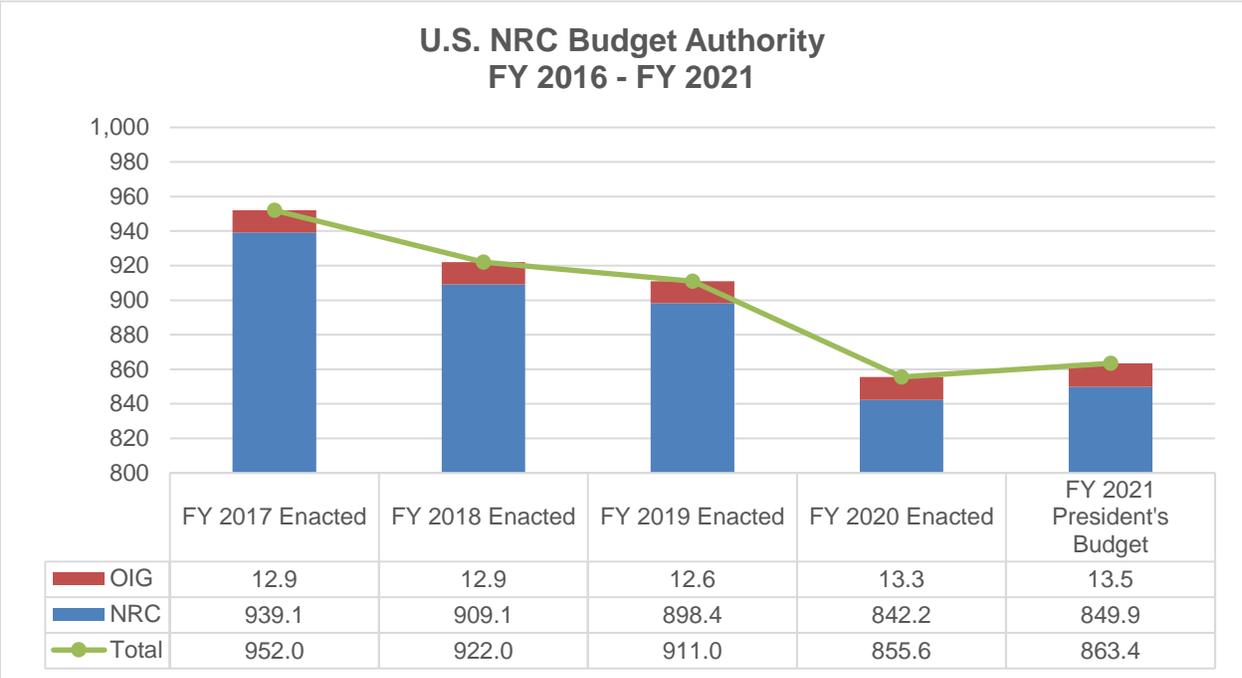
## Staffing and Resources

To perform its various functions, the NRC's FY 2021 Congressional Budget Justification (CBJ) contains 2,868 full-time equivalents (FTEs) staff, including the Office of the Inspector General (OIG). Approximately 74 percent of the staff work in Rockville, Maryland, and 26 percent work amongst four regional offices, located in King of Prussia, Pennsylvania (Region I); Atlanta, Georgia (Region II); Lisle, Illinois (Region III); and Arlington, Texas (Region IV), including the Resident Inspectors assigned to nuclear power plants and staff at the Technical Training Center in Chattanooga, Tennessee.



**Budget Authority**

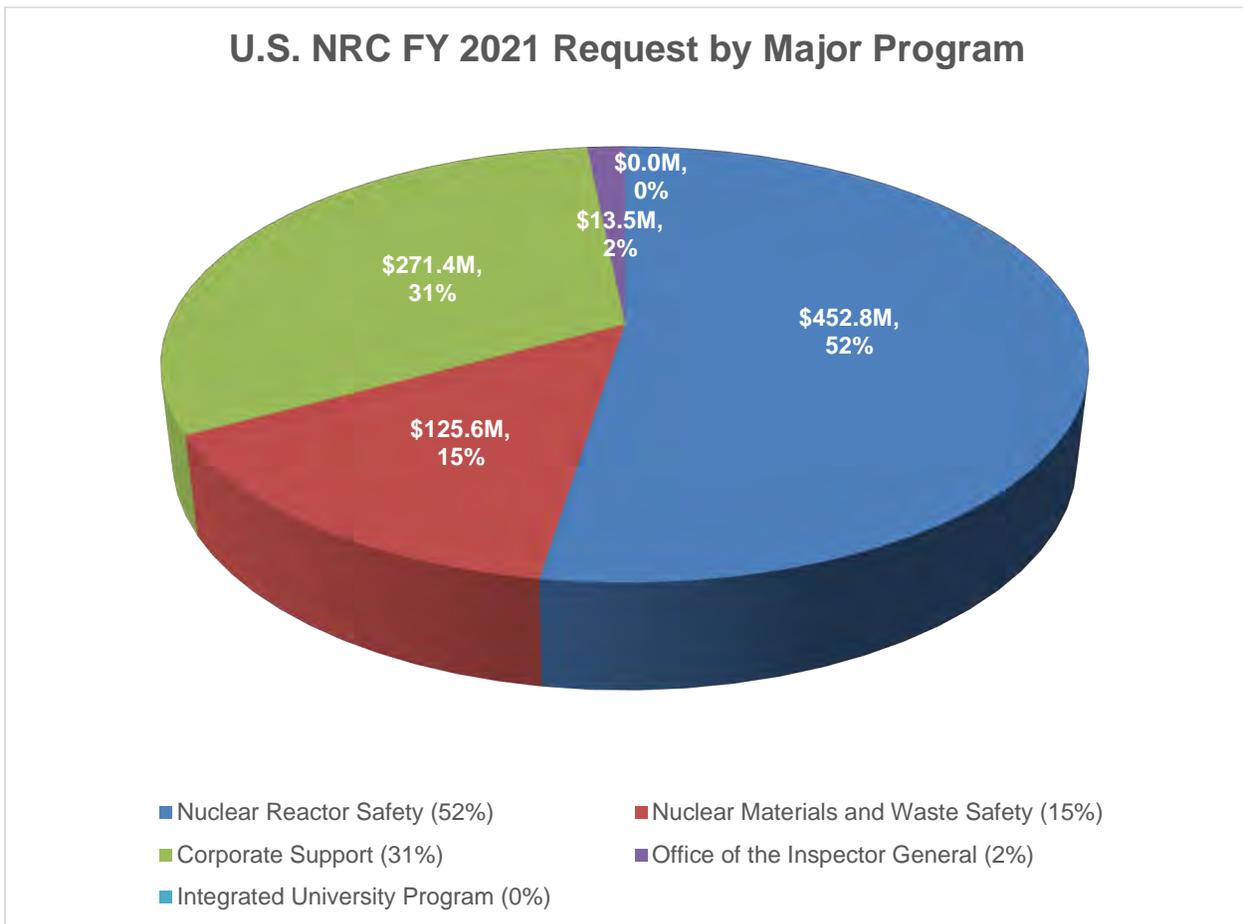
The agency's request (gross budget authority) for FY 2021 is \$863.4 million (M), including OIG. The NRC's FY 2021 CBJ will be offset by \$740.4M from fees collected from NRC licensees, resulting in a net budget authority of \$123.0M. The FY 2021 CBJ was submitted to Congress in February 2020.



The NRC's budget is comprised of seven programmatic business lines that fall into two major programs, as well as Corporate Support and the Integrated University Program.

Major Program	Business Line
Nuclear Reactor Safety	Operating Reactors New Reactors
Nuclear Materials and Waste Safety	Spent Fuel Storage and Transportation Nuclear Materials Users Fuel Facilities Decommissioning and Low-Level Waste High-Level Waste
Corporate Support	Corporate Support
Integrated University Program	Integrated University Program

Programmatically, the agency's FY 2021 request is as follows:

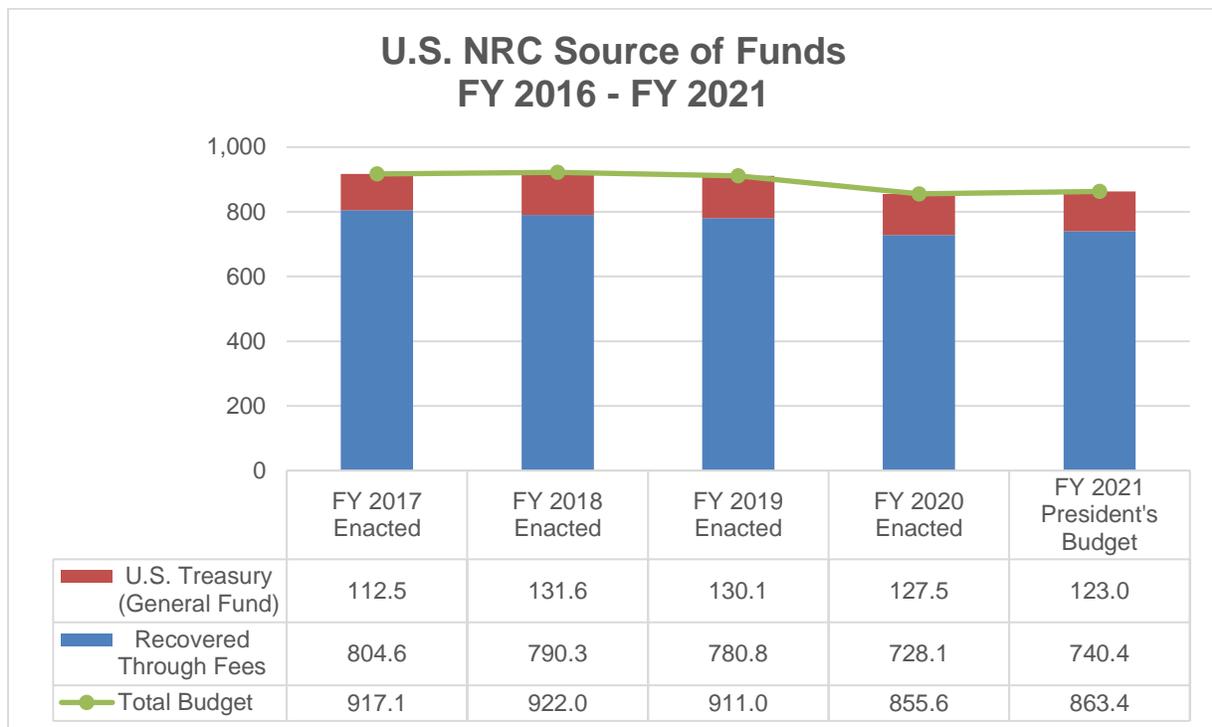


## High-Level Waste

The agency's FY 2021 request does not include funding for licensing activities related to the proposed deep geological repository for the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain, Nevada.

## Source of Funds

For FY 2021 and subsequent fiscal years, the Nuclear Energy Innovation and Modernization Act (NEIMA) requires the NRC, to the maximum extent practicable, to collect fees to offset approximately 100 percent of its new budget authority, less activities specifically excluded from fee recovery. NEIMA excludes from fee recovery any fee-relief activity, as identified by the Commission; amounts appropriated to the Commission from the Nuclear Waste Fund; and amounts appropriated to the Commission for Waste Incidental to Reprocessing, generic homeland security activities, Inspector General services for the Defense Nuclear Facilities Safety Board, research and development at universities in areas relevant to the mission of the Commission, a nuclear science and engineering grant program, and activities related to the development of regulatory infrastructure for advanced nuclear reactor technologies.



## NRC No-Year Funding

The majority of NRC's annual funding is appropriated from the Congress as "available until expended" or "no-year." The unobligated balances of NRC's no-year appropriations carry over into future fiscal years and are available to fund emergent needs, subject to reappropriation by the U.S. Office of Management and Budget and, for certain reprogrammings, advanced notification to the Congressional appropriations committees. The appropriations for the Office of

the Inspector General and for the Office of the Commission are limited in availability to two fiscal years.

**Budget Control Points**

Beginning with the FY 2016 appropriations, Congress established control points for the NRC, which include authorized prior-year carryover. Since FY 2017, the NRC has had five control points: Nuclear Reactor Safety, Nuclear Materials and Waste Safety, Decommissioning and Low-Level Waste, Corporate Support, and Integrated University Program. The following table shows the business lines that make up each control point.

<b>Control Point</b>	<b>Business Line</b>
Nuclear Reactor Safety	Operating Reactors New Reactors
Nuclear Materials and Waste Safety	Spent Fuel Storage and Transportation Nuclear Materials Users Fuel Facilities
Decommissioning and Low-Level Waste	Decommissioning and Low-Level Waste
Corporate Support	Corporate Support
Integrated University Program	Integrated University Program

Per Section 402(e) of the Energy and Water Development and Related Agencies Appropriations Act, 2020, the NRC continues to provide a monthly status report to Congress with the total budget authority, unobligated balances, and unliquidated balances for each control point as well as any prior-year appropriations.

**Funding by Fees**

The NRC is required by statute to recover a portion of its budget authority through fees. Effective October 1, 2020, NEIMA eliminates the 90 percent fee-recovery requirement that existed under the Omnibus Budget Reconciliation Act of 1990 and requires the NRC, to the maximum extent practicable, to recover approximately 100 percent of the budget authority, less the amounts appropriated for excluded activities.

To implement the fee-recovery requirement, the Commission each year, through notice and comment, conducts a rulemaking to promulgate new fee schedules based on the budget appropriated by Congress. The NRC assesses two types of fees to meet the fee-recovery requirement. First, fees established under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 170, under the authority of Title V of the Independent Offices Appropriation Act, 1952 (31 U.S.C. 9701), recover the NRC’s cost of providing services to identifiable applicants and licensees. Examples of services provided by the NRC for which 10 CFR Part 170 fees are assessed include license application reviews, license renewals, license amendment reviews, and inspections. Secondly, annual fees, established under 10 CFR Part 171, recover budgeted costs for generic (e.g., research and rulemaking) and other regulatory activities not recovered under 10 CFR Part 170 fees.

## **Financial Management**

The Chief Financial Officers Act of 1990 requires each of 24 designated agencies, including the NRC, to establish a CFO reporting to the head of the agency as a focal point responsible for financial management. The NRC's CFO reports to the Chairman. A major part of the CFO's responsibility, in conjunction with the Inspector General, is issuing annual audited financial statements. The NRC has produced audited financial statements every year since FY 1992 and has received unqualified audit opinions annually since FY 1994.

Other functions of the CFO include: overseeing all financial management activities relating to programs and operations of the agency; directing, managing, and providing policy guidance and oversight of the agency's financial management personnel, activities, and operations; monitoring the financial execution of the budget in relation to the actual expenditures; preparing and submitting the quarterly budget execution report to the head of the agency; developing and maintaining an integrated agency accounting and financial management system, including financial reporting and internal controls; and promulgation of the proposed and final fee rules.

The CFO also leads the budget formulation process, implementation plan process, budget structure, and development of the budget formulation schedule. In addition, the CFO ensures that Commission-level offices are equitably represented in programmatic budget discussions in which they have resources.

## **Office of the Commission Budget**

The FY 2020 appropriation legislation language limits the FY 2020 funds that may be used for Office of the Commission costs to \$9.5M, of which "the use and expenditure shall only be approved by a majority vote of the Commission" (P.L. 116-94, Division C, Title IV). Additionally, this appropriations legislation language limits the use of the \$9.5M available for Office of the Commission costs until September 30, 2021 (two fiscal years). After two fiscal years, the remaining amount will transfer to NRC general carryover. The FY 2021 request includes \$9.5M for the Office of the Commission.

## **Commission Bi-Weekly Budget Report**

The OCFO is responsible for creating a Bi-Weekly Commission Status of Funds Report. The report is developed to provide each of the Commission offices with a bi-weekly status of their commitments, obligations and expenditures relating to salary and benefits, travel, and contract support funding. The allowance is determined at the start of the fiscal year and placed into the following categories: Salaries and Benefits, Travel, and Other Cost (i.e., bankcard, ground transportation and training). The report ensures that the Commission Offices stay within their approved allowance.

## **Commission Awards**

Commission office awards are funded from the Commission budget. Commission offices must coordinate awards with the Office of the Chief Human Capital Officer (OCHCO) and OCFO to ensure adherence to Federal requirements and funds availability. In addition, Commission offices may coordinate time off awards for non-senior executive service/senior level staff with OCHCO.

**THE UNITED STATES**

**NUCLEAR REGULATORY COMMISSION**

**Agency Responsibilities Under the Law -  
An Introduction for Nominees to the Commission**

Marian L. Zabler  
Office of the General Counsel  
September 2020

## **FOREWORD**

This briefing material is prepared as a guide to the Nuclear Regulatory Commission for the benefit of newly nominated Commissioners. The material broadly covers the NRC's responsibilities under the law, its relationships with other governmental bodies, and the authority of the Chairman and Commissioners, as well as the legal constraints on that authority. It also includes guidance to Commission nominees on discussing pending adjudicatory matters.

## **I. INTRODUCTION**

### **A. History of the Agency**

The NRC is the successor to the Atomic Energy Commission (AEC), which was established by the Atomic Energy Act of 1946. In 1954, Congress amended the Atomic Energy Act and gave the AEC broad authority over research, development, regulation, and promotion of activities involving nuclear materials in the United States, including military activities. By the early 1970s, Congress decided to separate the AEC's military activities from its non-military activities and to separate the AEC's promotional and developmental roles from its regulatory role. Accordingly, in 1974, Congress enacted the Energy Reorganization Act, which established the NRC as an independent regulatory agency with jurisdiction over the non-military uses of nuclear materials. The Energy Reorganization Act also created the Energy Research and Development Administration (ERDA), which was responsible for the development and promotion of nuclear technology in both the civilian and military sectors. In 1977, Congress transferred the activities of the ERDA into the newly formed Department of Energy (DOE).

Congress established the NRC as an independent regulatory agency partially in response to a developing public concern that the AEC's regulatory responsibilities had taken a back seat to its promotional responsibilities. By 1974, an increasingly large segment of the public questioned the safety of nuclear plants and voiced concerns that terrorists would attack nuclear facilities or make weapons from stolen nuclear materials. Other members of the public voiced concerns about the proliferation of nuclear weapon-making capacity around the world and the lack of a solution to the problem of high-level radioactive waste disposal. Congress established the NRC as an independent regulatory agency without any promotional functions to increase greater public confidence in governmental decisionmaking in the nuclear area as the commercial nuclear power industry grew. From its inception, the NRC faced a two-fold task to make sound technical decisions and to achieve credibility for those decisions with the public.

The growth expected in the 1970s in the number of nuclear power plants did not occur. On the contrary, in the mid- to late-1970s, orders for new nuclear plants slowed and then ceased. Plans for a number of reactors, some already under construction, were canceled. Some of the causes for this shift include a leveling-off of growth in demand for electric power after the oil crisis of 1973, the repudiation of contracts for the supply of nuclear fuel by a major supplier in 1975, high interest rates and long reactor construction periods, increasingly sophisticated legal challenges by intervenors in licensing proceedings, construction problems in some plants, and the 1979 Three Mile Island accident.

In the years following the Three Mile Island accident, both the NRC and the nuclear industry intensified their focus on the safety of operating plants, resulting in a substantial overall improvement in power reactor safety and performance. For example, the NRC issued regulations to govern the licensing of a new generation of power reactors that would utilize advanced, standardized designs. The NRC also issued substantive and procedural regulations governing the renewal of power reactor licenses and license transfers. In recent years, the NRC has been actively working to make its licensing and inspection activities more risk-informed and, where appropriate, performance-based.

## **B. Adjudicatory Proceedings**

The Commission closely monitors the NRC's adjudicatory proceedings to ensure the agency makes timely decisions. The Commission also serves, in effect, as the appellate court within the NRC. In this role, the Commissioners perform a quasi-judicial appellate function.

Under the Atomic Energy Act, members of the public have a right to request a hearing in connection with licensing proceedings, as well as certain other types of proceedings specified in the Act.<sup>1</sup> Accordingly, at the NRC, adjudicatory proceedings are initiated by applicants, individuals, or entities requesting resolution of specific matters in controversy.

The hearing process for licensing proceedings (e.g., proceedings to determine whether to grant, amend, suspend, or revoke an NRC license or construction permit) is governed by procedures specified in 10 C.F.R. Part 2 (with the exception of export and import licensing proceedings, which are governed by 10 C.F.R. Part 110). At the outset of a licensing proceeding, the NRC publishes a notice of opportunity for hearing or otherwise notifies the public of the proceeding. In response to this notice, members of the public may submit petitions to intervene accompanied by requests for hearing.

To intervene in the proceeding, a petitioner must both (1) demonstrate that it has standing to intervene (similar to demonstrating standing to sue in federal court) and (2) submit at least one "contention" (i.e., claim) regarding the proposed licensing action that satisfies NRC procedural requirements and is therefore admissible for resolution in a hearing. NRC regulations also allow interested states, local governments, and federally recognized Indian Tribes to participate in NRC adjudicatory proceedings even if they do not submit any admissible contentions of their own. A detailed explanation and history of the development of NRC requirements for participation in its adjudicatory proceedings is included in Item 4 of the Background Information being provided to you.

Upon receipt of a petition to intervene and hearing request, the Commission typically will refer the matter to a three-judge Atomic Safety and Licensing Board. The three judges on the Board are drawn from the full slate of NRC administrative judges that compose the Atomic Safety and Licensing Board Panel, with the Chief Judge of the Panel making the assignments to each Board. The three-judge Board typically includes at least one lawyer trained in administrative procedure, who serves as the Board's presiding judge, and two judges who have NRC-relevant technical expertise.

Following referral, the Board will first determine whether the petitioner has made the necessary showings of standing and contention admissibility. This process typically involves briefing and oral argument before the Board. If the Board grants the petition and the hearing request, it will schedule an evidentiary hearing to resolve the contention. Between the grant of a petition to intervene/hearing request and the commencement of an evidentiary hearing, one or more parties may file a motion for summary disposition, in which the filing party asserts that there is no disputed issue of material fact left to resolve regarding one or more contentions. Granting a

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<sup>1</sup> The Atomic Energy Act also provides an opportunity to request a hearing in rulemaking proceedings dealing with the activities of licensees. For rulemaking proceedings, the NRC generally utilizes the notice-and-comment rulemaking process, with the comment process serving as the "hearing" for Atomic Energy Act purposes.

motion for summary disposition as to a particular contention serves to resolve the merits of that contention, obviating the need for a hearing on the contention.

Whether a petitioner succeeds or fails in obtaining an evidentiary hearing, NRC regulations provide rights to appeal adverse Board decisions to the Commission. Where a petitioner has failed entirely in its attempt to intervene, the petitioner may appeal to the Commission immediately following the Board's denial of the intervention request. Where the Board has granted intervention and admitted at least one of the petitioner's contentions for hearing, the petitioner must generally wait until the hearing process runs its course before appealing any adverse Board decision to the Commission. The Commission's practice has been to resolve appeals based solely on briefs filed by the various parties, and it does not normally hold oral argument.

For certain types of licensing actions, including new reactor licensing proceedings, the NRC also holds so-called "uncontested hearings" (also referred to as "mandatory hearings") to address the aspects of the application (and the NRC staff's environmental review of the application under the National Environmental Policy Act (NEPA)) that are not the subject of contentions that were admitted for hearing. The Commission may delegate to the Board the responsibility for conducting uncontested hearings. However, under current Commission practice, the Commission itself conducts uncontested hearings on new reactor applications for a combined license. Although the Board has typically conducted uncontested hearings on early site permits, the Commission conducted the hearing on the first early site permit application involving two or more small modular reactors. In addition, the Commission conducted the uncontested hearings on two separate applications for construction permits for proposed medical radioisotope production facilities.

## **II. THE NRC MISSION**

### **A. Scope of Authority**

The NRC's mission is to license and regulate the Nation's civilian use of radioactive materials to provide reasonable assurance of adequate protection of public health and safety, to promote the common defense and security, and to protect the environment. The basic statutory authority for these regulatory responsibilities is the Atomic Energy Act. The Atomic Energy Act reflects Congress' national policy favoring the development of peaceful uses of nuclear materials and atomic energy.

The Atomic Energy Act has been amended a number of times over the years, and Congress has enacted other laws that have expanded or imposed additional responsibilities on the NRC's regulatory authority. For example, in 1970, NEPA imposed broad new responsibilities on the NRC and other federal agencies to consider the environmental impacts of their actions. As already mentioned, in 1974, the Energy Reorganization Act split the promotional and regulatory functions of the AEC into two new agencies and established the NRC as an independent regulator of the civilian use of nuclear materials. More recently, Congress enacted the Energy Policy Act of 2005, which expanded the NRC's regulatory authority to encompass certain naturally occurring and accelerator-produced nuclear materials previously subject to regulation by the states. Other statutes prescribe the NRC's duties with regard to high-level radioactive waste, low-level radioactive waste, uranium mill tailings, environmental reviews, nuclear nonproliferation activities, and the regulation of nuclear exports.

The Atomic Energy Act has been described by the courts as “almost unique” in the degree of discretion it confers on the NRC to make the decisions it thinks best, using the procedures it considers most suitable. Given this discretion, only rarely will an NRC decision be overturned by a court on the ground that the decision violates substantive Atomic Energy Act requirements. The NRC’s freedom in this regard contrasts with the closely prescriptive language of later statutes governing such agencies as the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA). Reversals of NRC decisions for other reasons (i.e. procedural shortcomings), though still relatively uncommon, are more likely than reversals for substantive Atomic Energy Act noncompliance. In one instance, for example, the U.S. Court of Appeals for the D.C. Circuit overturned the NRC’s 2010 Waste Confidence decision and rule on NEPA grounds, unrelated to the NRC’s Atomic Energy Act responsibilities. In response, the NRC issued a new final rule and a Generic Environmental Impact Statement on the subject of continued storage of spent nuclear fuel, which was subsequently upheld by the D.C. Circuit.

The Atomic Energy Act defines the NRC’s responsibilities and authority over nuclear materials and nuclear facilities. The responsibilities include regulating the construction and operation of civilian nuclear reactors and fuel cycle facilities (e.g., uranium conversion facilities, fuel fabrication facilities, and uranium enrichment facilities), as well as regulating the possession and use of nuclear materials such as radiography instruments and well logging devices.

The NRC’s licensing authority extends to other federal agencies, such as the Tennessee Valley Authority for operation of its nuclear power plants and the U.S. Department of Veterans Affairs for use of radiopharmaceuticals in its hospitals.

Currently, 95 nuclear plants are licensed to operate. The NRC maintains oversight of a number of nuclear plants undergoing decommissioning and has regulatory jurisdiction over a number of non-power reactors.

There are currently 39 Agreement States. An Agreement State is a state to which, in accordance with the Atomic Energy Act, the NRC by agreement has transferred its authority to regulate certain categories of nuclear materials (excluding materials at nuclear power plants, fuel facilities, and federal agencies). The Agreement States collectively administering approximately 16,500 licenses for the possession and use of nuclear materials. Most recently, in September 2019, the State of Vermont became an Agreement State, assuming regulatory authority over byproduct materials as defined in Sections 11e.(1), (3), and (4) of the Atomic Energy Act, source materials, and special nuclear materials in quantities not sufficient to form a critical mass. Approximately 2,300 materials licenses remain regulated by the NRC itself.

The NRC also has responsibilities related to licensing and regulating the disposal of high-level waste by DOE (e.g., waste resulting from burnup of fuel in nuclear power plants); management and disposal of low-level waste (e.g., contaminated trash from nuclear power plants and hospital nuclear medicine departments); and uranium mill tailings (the radon-emitting piles of residual material that are left behind when uranium ore is mined and milled).

In 1998, Congress provided for NRC licensing of a DOE mixed oxide (MOX) fuel fabrication facility that is to be used to process materials resulting from the dismantling of U.S. nuclear weapons. In 2005, the NRC issued a Construction Authorization for a MOX fuel facility to be located at DOE’s Savannah River Site in South Carolina. A contested proceeding on the second phase of licensing (issuance of an operating license) ended in 2015; however, under

NRC regulations, the operating license cannot be issued until construction of principal structures, systems and components has been completed in accordance with the application. In 2018, DOE terminated the construction contract and ordered the contractor to stop work except for activities necessary to wind down construction operations and preserve existing structures associated with MOX facilities. DOE's decision to terminate construction of the MOX facility has been challenged in federal court by the State of South Carolina.

Since 2007, Congress has appropriated funding to the NRC to support nuclear education programs. This funding has been used to award grants to colleges and universities for college scholarships and graduate fellowships in the nuclear science, engineering, and health physics areas. The funding also has been used to award grants for curriculum development pertaining to nuclear safety, nuclear security, and nuclear environmental protection, and for faculty development grants to support non-tenured faculty in these relevant academic fields for the first six years of their careers. Some of the funds also have been used for scholarships for trade schools in nuclear-related trades. Although Section 243 of the Atomic Energy Act requires that recipients of educational assistance enter into a service agreement and commit to employment at the NRC, the NRC is statutorily authorized to waive these requirements because funding appropriated to foster nuclear education and a cadre of nuclear professionals is meant to benefit the entire nuclear sector, including federal agencies, academia, and industry.

## **B. International Responsibilities**

The NRC's primary international responsibility as a regulator is licensing the export of nuclear materials and equipment. Examples of such materials and equipment include low-enriched uranium fuel for nuclear power plants and multiple research and test reactors, highly enriched uranium for a limited number of research and test reactors, major components of nuclear reactors, and nuclear-related substances and minor reactor components such as pumps and valves. The NRC's principal role in regulating exports is to ensure they satisfy statutory criteria intended to prevent the proliferation of nuclear weapons and the malicious use of radioactive materials.

Criteria and procedures for issuance of NRC export licenses are set forth in the Atomic Energy Act, as amended by the Nuclear Non-Proliferation Act of 1978. The Atomic Energy Act requires the NRC to determine, in consultation with the Executive Branch, whether an export will adversely affect the common defense and security of the United States. The Act generally does not require the NRC to consider the safety or environmental effects of a nuclear export on the recipient country. The NRC is required to consult with the Executive Branch on export license applications (except for byproduct material applications), and it can issue a license only if the Executive Branch determines that the export will not be inimical to the common defense and security of the United States. In addition to its direct export-licensing role, the NRC is consulted by Executive Branch components such as the Departments of State, Energy, and Commerce on international nuclear-commerce activities falling under their authority. The NRC also participates in the negotiations and implementation of U.S. Government-initiated bilateral agreements for Peaceful Nuclear Cooperation pursuant to Section 123 of the Atomic Energy Act.

The NRC has licensing responsibility under the Atomic Energy Act for nuclear imports as well as exports. Under the NRC's regulations, the majority of nuclear imports are authorized under general license if the U.S recipient satisfies NRC's domestic receipt and possession requirements.

The NRC has bilateral programs of cooperation with many countries, including a cooperative

agreement with Taiwan to exchange technical information relevant to the safety and security of facilities in the United States and abroad. The NRC also has Memoranda of Cooperation with regulatory agencies in selected countries to strengthen their nuclear safety and security programs. In addition, the NRC is a party to more than 100 bilateral and multilateral research agreements. Through these agreements, international partners contribute funding to the NRC's joint research programs, such as its programs addressing code application and maintenance. Furthermore, the NRC often participates in international research programs conducted in other countries.

The NRC is also involved in, and has responsibilities related to, the negotiation and implementation of international legal instruments, including treaties and conventions. Examples include the Nuclear Non-Proliferation Treaty and Conventions on the following topics: Nuclear Safety; Physical Protection of Nuclear Material; Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management; Assistance in Case of a Nuclear Accident or Radiological Emergency; and Early Notification of a Nuclear Accident.

### **C. Limits on NRC Authority**

Generally speaking, the NRC does not have regulatory authority over DOE's nuclear activities unless that authority has been explicitly granted by statute. For example, the NRC does not have regulatory authority over the research and weapons-related nuclear facilities of DOE, such as the Pantex facility in Texas, the Hanford Reservation in Washington, and the Los Alamos National Laboratory. The NRC also does not have regulatory authority over DOE's determinations that radioactive waste incidental to reprocessing found in waste tanks at DOE sites in the states of South Carolina and Idaho is not high-level radioactive waste, or DOE's subsequent disposal of this incidental waste. Nor does the NRC generally have the authority to regulate the disposal of DOE's low-level radioactive waste.

There are, however, a number of exceptions to the general rule. Various statutes have given the NRC the authority to regulate certain DOE activities. For example, the NRC has authority to regulate DOE's disposal of commercial greater-than-Class-C waste and disposal activities for all high-level radioactive defense wastes generated by DOE.

Additionally, through legislation enacted in 2004, the NRC assumed the roles of: (1) consultant to DOE regarding the determinations that radioactive waste incidental to reprocessing found in waste tanks at DOE sites in the states of South Carolina and Idaho is not high-level radioactive waste; and (2) monitor of, in coordination with these states, disposal of the incidental waste in the tanks in order to assess conformance with specified portions of the NRC's regulations governing disposal of low-level radioactive waste.

Prior to the Energy Policy Act of 2005, the NRC did not have regulatory authority over accelerator-produced material, discrete sources of radium-226, or certain other discrete sources of naturally occurring radioactive material. Section 651(e) of the Act, however, expanded the NRC's regulatory authority to encompass those materials. The NRC has promulgated regulations implementing this authority.

#### D. The NRC as an Independent Regulatory Agency

The NRC is an independent regulatory agency within the Executive Branch. The NRC's status as an independent agency means that its regulatory decisions ordinarily cannot be prescribed by the President, and its communications with Congress generally do not require clearance or approval from the Office of Management and Budget (OMB). There are three significant exceptions to this general rule: (1) in budget formulation, the NRC must obtain OMB approval of its budget proposals before submitting them to Congress; (2) when seeking to collect information from ten or more persons outside the federal government, the Paperwork Reduction Act requires the NRC to obtain OMB approval of the information collection; and (3) when the NRC plans to issue new or amended regulations or guidance, the NRC generally must obtain OMB's determination on whether the issuance constitutes a "major rule" as defined in the Congressional Review Act.

In addition to maintaining the NRC's independence within the Executive Branch, Commissioners and their personal staffs must endeavor to keep the decisional process free from improper outside influence. This is especially important in the case of agency adjudications, some of which are governed by hearing procedures similar to those used in trials before a judge in federal court. When the Commissioners take part in adjudications, they ordinarily act in the role of appellate judges (reviewing the decisions of lower judges), and the same kinds of strictures applicable to federal judges apply in general to them.

A Commissioner acting in an adjudicatory role should be aware of several major points:

- Licensing proceedings that are contested by an intervenor (except for export and import licensing proceedings) are conducted using procedures codified in 10 C.F.R. Part 2. The NRC in 2004 promulgated major changes to Part 2 that require in most adjudications the use of less formal procedures than had been used historically. These procedures fully comply with the requirements imposed by the Administrative Procedure Act and include rules governing the conduct of decisionmakers (including Commissioners) in adjudicatory proceedings.
- The NRC has an *ex parte* rule that bars all communications on the merits of the case between the decisionmaker and any party to the proceeding, unless those communications are made known to all other parties to the proceeding. The rules ordinarily take effect as soon as a notice has been published in the *Federal Register* that a hearing on a particular matter will be held. These rules help ensure that parties to a proceeding will have the opportunity to know and, if necessary, contest whatever information the decisionmaker is relying on. Adjudicators, including Commissioners, must base their decisions in contested cases on factual and expert opinion evidence in the record of the proceeding and may not rely on *ex parte* communications.
- The NRC also has a "separation of functions" rule that bars communications between "adjudicatory" staff (i.e., Commissioners and their personal staff, as well as other agency employees who perform adjudicatory functions, such as employees in the Office of the Secretary or the Office of Commission Appellate Adjudication) and NRC staff performing an investigative or litigating function in the proceeding, if those communications are relevant to disputed issues in an adjudication. Any such communications must be made available to all parties to the proceeding. Similar to the *ex parte* rule, this assures parties to an NRC adjudication that decisions will be made solely on evidence that is in

the record and available to all parties, and not on undisclosed statements or evidence within the NRC.

- A written communication to a Commissioner addressing a matter relevant to the merits of a proceeding—for example, a letter urging that a license be issued, or denied, for a specific nuclear plant—is an *ex parte* communication unless the submitter also serves the communication on all parties to the proceeding. A Commissioner who receives a communication relevant to the merits of a proceeding that has *not* been served on all parties should contact the Office of the Secretary so that the communication can be placed in the record of the proceeding and served on all parties. If the Commissioner wishes, the Office of the Secretary will draft the response to the *ex parte* communication and serve it to parties along with the incoming communication.
- If an *ex parte* communication is made orally, it is necessary to memorialize the statement, place it in the record, and have it served. To avoid such situations, it is sometimes advisable (for example, when visiting a nuclear power plant that is involved in a formal NRC adjudication) for the Commissioner to announce at the outset that he or she will not participate in a discussion of issues that are in dispute in the pending proceeding. Likewise, a Commissioner can help avoid concerns about possible *ex parte* communications during a site visit by informing counsel for all parties about the visit in advance and by inviting those who wish to attend to accompany him or her.
- Adjudicators should not prejudge the merits of any issue involved in a proceeding, nor should they make comments that may give even the appearance of prejudgment. For a sitting Commissioner, public statements suggestive of prejudgment may lead to requests for disqualification from a particular case. (Where a Commissioner refuses a request for disqualification and a court later finds that this refusal was improper, the decision in which he or she participated will usually be set aside—even if the Commissioner’s vote was only one of a unanimous 5-0 decision.) A nominee should err on the side of caution when a question calls for an answer that could be understood to indicate prejudgment of a particular case or issue. Based on prior experience, a nominee for a position on the Commission is unlikely to be faulted for explaining frankly to a Member of Congress that a question comes so close to the issues involved in a particular case that he or she does not feel comfortable responding to it.

### **III. ORGANIZATION AND FUNCTIONS OF THE COMMISSION**

The Energy Reorganization Act of 1974 requires that the five Commissioners be American citizens, and that no more than three belong to the same political party. Commissioners serve fixed terms and are removable only for cause. The President designates one Commissioner to serve as Chairman; the Chairman serves in that role at the pleasure of the President. If the Chairman is relieved of that position by the President, he or she remains a Commissioner. The statute further provides that each member of the Commission shall have full access to information necessary to fulfill his or her job duties, and “equal responsibility and authority in all decisions and actions of the Commission.” A Commissioner can have no other employment while serving on the Commission.

Reorganization Plan No. 1 of 1980, issued by President Carter and later enacted into law by Congress, clarifies that functions pertaining to policy formulation, rulemaking (with limited exception), adjudications, and adjudicatory orders are reserved for the Commission as a collegial body. In addition to the Commission's domestic policy and adjudicatory duties, the Commissioners are often called upon to perform international functions, including representing the nation abroad and meeting with visiting foreign dignitaries. The Commission also provides guidance to NRC staff participating in international activities.

The Reorganization Plan also makes clear that the Chairman has additional responsibilities, as spokesman and principal executive officer of the Commission, that significantly differentiate the Chairman's role from that of other Commissioners. The Chairman initiates the appointment, subject to the approval of the Commission, of the Executive Director for Operations, Chief Financial Officer, Deputy Chief Financial Officer, General Counsel, Secretary of the Commission, Director of the Office of International Programs, Director of the Office of Commission Appellate Adjudication, and the Chief Administrative Judge and other members of the Commission's Atomic Safety and Licensing Board Panel. The Chairman or a member of the Commission may initiate the removal of these officers, with removal subject to approval of the Commission.

Similarly, the appointments of the following officers, which are initiated by the Chairman after consultation with the Executive Director for Operations, are subject to the approval of the Commission: Director of the Office of Nuclear Reactor Regulation; Director of the Office of Nuclear Material Safety and Safeguards; Director of the Office of Nuclear Regulatory Research; and Director of the Office of Nuclear Security and Incident Response. The Chairman or a member of the Commission may initiate the removal of these officers, with the removal subject to approval of the Commission. Appointments to the NRC's federal advisory committees are also initiated by the Chairman and subject to the approval of the Commission. In addition, the Chairman appoints the Directors of the Offices of Public Affairs and Congressional Affairs; no Commission approval is required for these appointments.

As principal executive officer of the NRC, the Chairman is responsible for developing policy planning and guidance. The Chairman's authority is circumscribed by the right of the Commissioners as a body to make policy and also to decide, in matters of reasonable doubt, what constitutes a policy issue requiring a collegial Commission decision, rather than resolution by the Chairman or the NRC staff.

The Reorganization Plan transfers to the Chairman all of the functions vested in the Commission pertaining to an emergency concerning a particular NRC facility or materials licensed or regulated by the Commission. In such a situation, the Chairman shall conform to the policy guidelines of the Commission and, to the maximum extent practicable, keep the Commission informed of his or her actions. A limited amount of the Chairman's emergency authority has been delegated to certain NRC senior managers so that emergency actions can be taken in the event of an imminent security threat requiring such immediate action that insufficient time exists to invoke the emergency powers reserved to the Chairman.

The Chairman may delegate the authority to perform emergency functions, in whole or in part, to any of the other members of the Commission or the NRC staff, although the expectation is that any such delegation would be to another Commissioner. The Consolidated and Further Continuing Appropriations Act, 2015 included permanent requirements for the Chairman to

provide certain notifications and reports to the Commission and certain Congressional committees in connection with the invocation and exercise of emergency functions.

To transact business, a quorum of Commissioners (i.e., a statutorily mandated minimum of three) is required to be “present.” The definition of a quorum is interpreted to include Commissioners participating by speakerphone (so long as the absent Commissioner can hear all participants, and all participants and persons in the audience can hear the Commissioner). A Commission decision is reached by a majority of those participating. Commissioners may vote, abstain (in which case they are regarded as participating), or decline to participate. The Commissioners issue formal votes using written vote sheets, a practice commonly referred to as notation voting. To approve final rules and issue adjudicatory decisions, the Commissioners must also meet to affirm their written votes in person.

In addition to establishing three members as a quorum, Section 1 of the Reorganization Plan provides that the performance of any Commission function may be delegated to a member of the Commission, including the Chairman. In 1994, the Commission sought to address the possibility that vacancies or a Commissioner’s incapacity might deprive the Commission of the ability to field a quorum. To ensure the agency could continue to function under those circumstances, the Commission executed a Delegation of Authority that automatically delegates all Commission functions to the Chairman (or, if necessary, to the ranking Commissioner) whenever fielding a quorum becomes impossible due to vacancies or a Commissioner’s incapacity. Such a delegation did, in fact, occur in 1995 when vacancies dropped the Commission’s membership to two. Under the delegation’s terms, the Chairman or Commissioner exercising this delegated authority must consult with the other Commissioner (if there is one) before taking action, but may act without concurrence.

The results of Commission deliberations are set forth in rules, orders, and “Staff Requirements Memoranda” (SRMs), which record how Commissioners voted, describe the outcome, and typically direct some unit of the staff to take a particular action. Most Commission actions are taken in response to NRC staff papers (SECY papers), which are generally made public 10 days after they are submitted to the Commission. There are, however, important exceptions. For example, advisory memoranda from the Office of the General Counsel, as well as documents containing draft adjudicatory orders, security-related information, or investigatory or enforcement information are generally not made public.

Commission meetings involving three or more Commissioners are typically subject to the Government in the Sunshine Act, which applies to all multi-member federal agencies. This statute applies to all Commission “meetings,” as the term is defined in the Act. Advance notice of Sunshine Act meetings must be given, and the meetings must be held in open session, with the public free to attend, unless the subject of the meeting falls into certain designated categories. When a meeting is closed to the public, a transcript or a recording must be created and retained, except for limited exceptions where case notes or minutes will suffice. A major effect of the Sunshine Act, as noted by many observers, has been to discourage multi-member agencies from meeting, thereby tending to impair collegiality.

In 1985, the Commission issued a final rule that, consistent with a then-recent Supreme Court decision on the meaning of “meeting” under the Sunshine Act, revised the definition of meeting to provide the greater procedural latitude afforded agencies by the Court’s decision. The Commission, however, decided not to implement the rule in the face of heavy criticism from Congress and in the press. In May 1999, the Commission published a *Federal Register* Notice

stating that it intended to implement its 1985 rule and sought public comment on the matter. In July 1999, the Commission published another *Federal Register* Notice addressing the public comments and announcing the Commission's intent to implement its 1985 regulations. Under its revised definition of a "meeting," informal, preliminary, and big-picture discussions (i.e., discussions that are not sufficiently focused on discrete proposals or issues as to cause, or be likely to cause, the Commissioners to reach reasonably firm positions on matters pending or likely to arise before the agency) may be held as non-Sunshine Act discussions. The Commission stated, in the July 1999 *Federal Register* Notice, that it did not intend to hold non-Sunshine Act discussions with representatives of NRC licensees, nuclear industry groups, or organizations that could be considered interested parties in NRC adjudications, rulemakings, or the development of guidance. The Commission only rarely holds non-Sunshine Act discussions (of any kind).

A detailed description of the Commission decisionmaking process is set forth in the "Internal Commission Procedures."

#### **IV. RELATIONSHIP TO OTHER GOVERNMENTAL BODIES**

##### **A. Executive Branch**

##### **1. The White House**

As noted above, the NRC's status as an independent regulatory agency means that the White House cannot directly set NRC policy. The White House can influence NRC policy, however, both by appointing Commissioners and a Chairman in whose outlook and judgment it has confidence and by making its views known on non-adjudicatory matters. In certain areas, such as national security policy, the Commission has declared its intent to give great weight to Executive Branch views. In other policy matters, White House and Executive Branch officials may properly endeavor to influence NRC decisions, either publicly or privately, but ultimately the NRC has the discretion to make its own decision.

The NRC also interacts with the National Security Council and other parts of the White House in such areas as combating terrorism and strengthening homeland security, as well as helping the United States develop appropriate policies for cooperation with, and assistance to, other countries.

##### **2. Office of Management and Budget**

The Budget and Accounting Act of 1921 requires the NRC to submit its appropriations and supplemental appropriations requests to the President. The procedures for complying with this statutory requirement are in OMB Circular A-11.

Pursuant to that Circular, the NRC submits its annual budget requests, including proposed personnel ceilings, to OMB for review and approval. Pursuant to OMB Circulars A-11 and A-19, the NRC is also required to submit for OMB review and approval any legislative proposals needed to implement its budget request (authorization and appropriations bills) and Congressional testimony supporting its budget request.

OMB does not "clear" the NRC's non-budgetary testimony, legislative proposals, or responses to Congressional correspondence. In virtually all cases, copies of the NRC's Congressional

testimony are provided to OMB for its information after submission to Congress, but before the hearing. In limited circumstances, where issues affect not only the NRC but also other federal agencies, OMB may be asked to provide comments on NRC testimony, legislative proposals, or Congressional correspondence. Though OMB frequently requests the NRC's views on specific pieces of legislation, it does not review the NRC's responses to requests from Congress for comment on pending bills. Copies of such responses are provided to OMB after they have been submitted to Congress.

Under the Paperwork Reduction Act, OMB also reviews any proposed NRC information collections, such as reporting requirements contained in proposed rules, surveys distributed to NRC licensees, or other attempts to collect information from ten or more persons or entities (even if responding is not mandatory). OMB's decisions on whether the information can be collected may be overridden by a majority vote of the Commission.

For most final NRC rules, the Congressional Review Act requires OMB's Office of Information and Regulatory Affairs to determine whether they are "major rules" (i.e., would have more than a \$100 million annual impact on the economy, would cause a major increase in costs or prices, or would have certain significant adverse economic impacts). As used in the Congressional Review Act, the term "rule" includes not just legally binding regulations published in the Code of Federal Regulations, but many regulatory guidance documents as well. To determine if a "rule" is a "major rule," OMB typically reviews an NRC-prepared summary of the rule's economic impacts, rather than the rule itself. If OMB determines a rule is a major rule, it cannot be made effective until at least 60 days after publication in the *Federal Register*. The Congressional Review Act also requires the NRC to submit all rules, major or not, to Congress and to the Government Accountability Office before they take effect.

Under the E-Government Act of 2002, OMB holds a central role in issuing guidance and providing oversight over any federal electronic government initiatives, including the NRC's initiatives. In addition, under the Federal Information Security Management Act of 2002, as amended by the Federal Information Security Modernization Act of 2014, OMB has an increased oversight role over the NRC's information-security policies and practices.

### **3. Department of Energy**

As noted above, DOE was formed out of the ERDA, which in turn was formed from the AEC by the Energy Reorganization Act of 1974. In addition to its weapons-related functions, DOE is responsible for promoting the peaceful use of nuclear power through research, grants, loan guarantees, demonstration projects, and the provision of risk insurance to a limited number of applicants for new power reactor licenses.

As a general rule, the NRC does not license or otherwise regulate DOE facilities except where specifically authorized by statute. Congress has specifically authorized the NRC to license and regulate a number of DOE facilities and activities. These facilities include (1) facilities used primarily for the receipt, storage or disposal of high-level radioactive waste generated from NRC-licensed activities, (2) any DOE facility authorized for long-term storage or disposal of high-level radioactive waste from DOE defense activities, (3) any DOE facility for disposal of certain commercial low-level waste (so-called "greater- than-Class-C waste"), (4) any DOE Monitored Retrievable Storage Facility for storage of spent nuclear fuel, and (5) any high-level waste repository, such as the proposed repository at Yucca Mountain. They also include any facility utilized for fabricating mixed plutonium-uranium oxide (MOX) fuel for use in a commercial

nuclear reactor. To date, the NRC has licensed two DOE independent spent fuel storage facilities and has issued a construction authorization for the DOE MOX fuel fabrication facility.

In compliance with the Energy Policy Act of 1992, DOE leased the two gaseous diffusion uranium enrichment plants (GDPs) in operation in the U.S. (the Portsmouth GDP in Ohio, and the Paducah GDP in Kentucky) to a government corporation named the United States Enrichment Corporation (USEC). Regulatory jurisdiction over the GDPs was transferred from DOE to the NRC upon the NRC's certification that the GDPs complied with the NRC's safety and safeguards standards, as articulated in a rule codified as 10 C.F.R. Part 76. Consistent with the statutory provisions, each of the GDPs was issued a certificate of compliance rather than an NRC license. The NRC assumed regulatory jurisdiction over the GDPs in 1997. USEC was privatized in an initial public offering consummated in 1998. Both the Portsmouth and Paducah facilities have permanently shut down enrichment operations, and the NRC terminated their certificates of compliance in October 2011 and February 2015, respectively. Therefore, these facilities are no longer under the NRC's regulatory authority. DOE is responsible for overseeing cleanup activities at the Paducah and Portsmouth sites.

USEC (now known as Centrus) also previously held two Part 70 licenses. One was for the centrifuge technology demonstration facility (known as the American Centrifuge Lead Cascade Facility) located at the Portsmouth GDP site in Ohio. This facility permanently ceased operation in March 2016 and is currently undergoing NRC-approved decommissioning. The second license was for the American Centrifuge Plant (ACP), which is a yet-to-be-built commercial enrichment facility. Centrus has submitted an amendment application to allow production of high-assay low-enriched uranium (HALEU) at the ACP.

The West Valley Demonstration Project Act authorizes DOE to carry out a high-level liquid nuclear waste management demonstration project at the Western New York Service Center in West Valley, New York. The NRC is responsible for monitoring both DOE's activities at the site and DOE's review of documents under the project.

DOE is statutorily authorized to determine, pursuant to specified criteria and after consultation with the NRC, that certain radioactive waste resulting from the reprocessing of spent nuclear fuel is not "high-level radioactive waste." The NRC is required, in coordination with any affected state, to monitor DOE's disposal actions of this incidental waste to assess conformance with specified portions of the NRC's low-level radioactive waste regulations, but the NRC does not have licensing or regulatory authority over the disposal of the waste.

The NRC also reviews, at DOE's request, the adequacy of DOE casks for shipping spent nuclear fuel. Additionally, any demonstration reactor developed by DOE that generates power for commercial purposes or that is otherwise intended to demonstrate the reactor's commercial feasibility would require an NRC license. Furthermore, the NRC licenses certain defunct uranium mill tailing sites once DOE has taken custody of the site and is taking or has taken appropriate remedial action.

In the nuclear non-proliferation arena, DOE solicits NRC's views before approving activities involving the transfer of special nuclear material production technology to foreign governments or subsequent arrangements under the Atomic Energy Act (e.g., retransfer of nuclear materials or reprocessing of U.S.-supplied material).

The NRC has also participated in DOE-sponsored workshops with officials of countries that are considering whether to build nuclear power reactors for the first time. These sessions have focused on helping these countries develop a legal framework and regulatory infrastructure for power reactors, stressing the importance of establishing an independent regulatory body. DOE National Laboratories such as the Idaho, Pacific Northwest, Brookhaven, Oak Ridge, Argonne, and Sandia National Laboratories provide important research and technical contract support to NRC programs. Over the years, legislation has been introduced in Congress, but not passed, which would give the NRC regulatory jurisdiction over some of DOE's laboratories.

#### **4. Department of State**

By law, the export and import of nuclear equipment and material requires an NRC license. On significant applications, the Commission, in accordance with the Atomic Energy Act, as amended by the Nuclear Non-Proliferation Act of 1978, requests the State Department to provide Executive Branch views on whether the license should be issued. The State Department solicits the views of the Departments of Energy, Defense, and Commerce, and then provides the NRC with a coordinated Executive Branch position. The law provides that the President can reverse the Commission's decision in cases where the NRC, after receiving Executive Branch views supporting license issuance, determines that the export licensing criteria have not been met and disapproves issuance of the license. This Presidential determination is subject to Congressional override through the enactment of legislation disapproving the President's override of the NRC decision. In only two cases (in the late 1970s), both involving applications to export fuel for India's Tarapur reactor, has a President overruled an NRC decision not to grant an export license. In both cases, Congress did not override the President's action.

The NRC also interacts with the State Department in such matters as negotiating international agreements in the nuclear field; in its dealings with such international organizations as the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD); in developing policy on nuclear issues under the NRC's purview or of impact to the NRC; in planning and coordinating programs of nuclear safety and safeguards assistance to other countries, and in coordinating foreign travel. In recent years, the NRC has participated in the negotiation of agreements for cooperation with numerous countries.

The State Department also provides the Commission with periodic briefings on international matters. At the request of the State Department, the NRC has also recently participated in U.S. diplomatic missions to some countries that are considering building their first nuclear reactors.

#### **5. Environmental Protection Agency**

As set forth in Reorganization Plan No. 3 of 1970, the EPA is authorized to establish generally applicable environmental standards for the protection of the general environment from radioactive material. In this regard, Reorganization Plan No. 3 defines standards as limits on radiation exposures or levels, or concentrations or quantities of radioactive material, in the general environment outside the boundaries of NRC-licensed facilities. The NRC, in turn, is responsible for regulating liquid and gaseous radiological effluents released into the environment at the boundaries of the NRC-licensed site as well as regulating such effluents within the boundaries of the licensed site.

Under the Atomic Energy Act, as amended by the Uranium Mill Tailings Radiation Control Act (UMTRCA), EPA sets generally applicable environmental protection standards with respect to the processing, possession, transfer, and disposal of byproduct material at sites where ores are processed primarily for uranium or thorium extraction. Under this statutory scheme, the NRC then promulgates regulations to implement these generally applicable standards. The NRC or an Agreement State, as the licensing agency, is responsible for implementing and enforcing these regulations (the Agreement State will have its own regulations or legally binding requirements that must be compatible with the NRC regulations and adequate to protect public health and safety). In July 2020, the NRC and EPA entered into a Memorandum of Understanding (MOU) entitled “Concerning the Regulation of Uranium *in situ* Recovery Activities,” to clarify the respective roles and responsibilities of each agency under UMTRCA, particularly in regard to rulemaking by either agency in this subject matter area.

In addition, the NRC and the EPA will often act as separate permitting agencies for a nuclear facility. For example, a commercial nuclear power plant will need both an NRC operating license and a Clean Water Act permit from the EPA (or a state agency acting under EPA-delegated authority). Other areas in which the obligations and interests of the two agencies overlap include high-level radioactive waste, low-level radioactive waste, mixed waste (waste containing both NRC-regulated radioactive material and EPA-regulated hazardous chemicals), sites to be remediated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and emergency planning.

Because of their respective missions, the NRC and the EPA have differed on a number of radiation protection issues, including applicability of the Clean Air Act to NRC licensees, environmental standards for disposal of low-level radioactive waste, groundwater and drinking water protection, site decommissioning, and standards for disposal of high-level waste. In 1992, the NRC and EPA entered into an MOU that establishes a framework for resolving differences.

The NRC and EPA have worked cooperatively in many areas. For example, upon the NRC’s adoption of constraints on airborne radioactive effluents to the environment from NRC-licensed facilities, EPA found that the NRC’s regulatory program provides an ample margin of safety to protect public health and, thus, rescinded its Clean Air Act regulations for radioactive air emissions from NRC-licensed facilities. In addition, the staffs of the NRC and EPA collaborated on a white paper on “risk harmonization,” designed to ensure greater consistency in the two agencies’ approach to radiological hazards of various kinds. In 2002, the NRC and EPA entered into an MOU entitled “Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites,” which sets forth the agencies’ agreement to continue the EPA’s policy of deferring the exercise of its CERCLA authority to the NRC’s decisionmaking (under the Atomic Energy Act) with respect to the decommissioning of NRC-licensed sites, except in certain circumstances.

## **6. The Department of Homeland Security**

In 2002, Congress enacted the Homeland Security Act, which established the Department of Homeland Security (DHS) as a cabinet-level department, and a Homeland Security Council, which was similar in purpose and structure to the National Security Council at that time. In 2009, President Obama merged the National Security Council and the Homeland Security Council to create the National Security Staff (NSS), which has since been renamed the National Security Council.

Although the NRC coordinates closely with DHS on security and incident response matters, the Homeland Security Act did not transfer any of the NRC's authority or responsibilities to DHS and did not amend either the Atomic Energy Act or the Energy Reorganization Act. The NRC thus retains its statutory authority, responsibility, and legal independence over the non-military uses of nuclear materials.

DHS was created by combining different elements of established departments that were once part of DOE, EPA, and the Department of Justice (DOJ) (among others), and independent agencies such as the Federal Emergency Management Agency (FEMA). The NRC has long worked closely with several of these organizations. For example, the NRC's incident response plans involve close coordination and cooperation with portions of DOE and EPA that were transferred to DHS. In addition, the Coast Guard (the only military branch within DHS) is heavily involved in security at nuclear power plants located on the nation's waterways.

The NRC's closest relationship, however, is with FEMA. In December 1979, after the Three Mile Island accident, President Carter issued a directive that assigned the lead responsibility for offsite emergency planning and response at nuclear power plants to FEMA. This responsibility was incorporated into DHS in 2002 with the transfer of FEMA to that agency. The NRC retained responsibility for evaluating onsite planning, and for making the overall finding that a plant can operate "without undue risk to public health and safety." A 1993 MOU between the two agencies lays out the FEMA/NRC relationship for emergency planning. Among other responsibilities, FEMA assists the NRC power reactor licensing process by providing reviews and evaluations, as well as expert witnesses to present testimony in licensing hearings. FEMA also participates with the NRC during emergency exercises at nuclear facilities by observing and evaluating the offsite protective action recommendations. Following a natural disaster at or near a nuclear plant (for example, a hurricane), FEMA also evaluates offsite conditions and the adequacy of offsite emergency preparedness. FEMA's findings are not necessarily binding on the NRC, but the NRC presumes the findings are valid unless controverted by persuasive evidence. Under Executive Order 12657, FEMA can also assist in developing emergency plans if a utility certifies in writing that a State or local government has failed to do so.

The NRC has devoted considerable resources to preparing for and conducting several National Level Field Exercises in conjunction with FEMA. FEMA and the NRC have also been working for several years on issues relating to the use of potassium iodide in radiological emergencies. The NRC continues to work with FEMA on a number of preparedness and response issues.

The NRC has also coordinated closely with DHS in the development of the National Response Framework, formerly known as the National Response Plan, an all-discipline, all-hazards plan that establishes a single, comprehensive framework for the management of domestic incidents, including nuclear emergencies. It provides the structure and mechanisms for the coordination of federal support to State, local, and Tribal incident managers and for exercising direct federal authority and responsibility.

DHS has the overall responsibility for maintaining the National Response Framework and for coordinating the federal government's response under the National Response Framework. The National Response Framework does not alter the NRC's independent authority or prevent the NRC from acting under its independent authority in the event of a nuclear incident, but rather provides a procedural framework for coordinating the overall federal response to an incident.

DHS has prepared reports on the adequacy of security at national critical infrastructure facilities, including nuclear power plants. The DHS reports help establish national priorities for the allocation of federal funds to enhance homeland security.

In addition, pursuant to a requirement in the Energy Policy Act of 2005, DHS and the NRC have entered into an MOU under which the NRC, prior to issuing a license for a utilization facility, will consult with DHS regarding the proposed facility location's potential vulnerabilities to terrorist attack.

DHS also coordinates with the NRC regarding chemical security at NRC-licensed facilities. DHS has the authority to regulate the security of high-risk chemical facilities and has developed risk-based performance standards for security at these facilities (6 C.F.R. Part 27, known as the Chemical Facility Anti-Terrorism Standards). However, Congress exempted certain facilities, including facilities subject to NRC regulations, from DHS regulations. In 2011, the NRC and DHS entered into an MOU to clarify this exemption by limiting it to those facilities at which the NRC had imposed extensive security requirements. Then, in 2012, the Commission issued a staff requirements memorandum (SRM) (SRM-SECY-11-0108) directing the staff to conduct further threat analysis and to obtain stakeholder input to assist the NRC's effort to ensure that specified chemicals in quantities of concern are adequately protected at designated classes of NRC-licensed facilities. In response to the SRM, the staff completed site visits to all relevant NRC-licensed facilities and gathered information on the type, quantity, and security of chemicals. In 2014, the staff developed a SECY paper (SECY-14-0112) setting forth options for Commission consideration addressing the security of chemicals in quantities of concern at certain NRC-licensed facilities. In a 2015 SRM (SRM-SECY-14-0112), the Commission directed the staff to develop a process for keeping NRC licensees informed on changes in DHS's list of chemicals in quantities of concern.

## **7. Occupational Safety and Health Administration**

The NRC has two MOUs that define its relationship with OSHA. The first MOU was entered into in October 1988, prompted in large part by a 1986 accident at the Sequoyah Fuels Corporation facility in Gore, Oklahoma involving the death of a worker from exposure to hydrofluoric acid following the rupture of an overloaded cylinder containing uranium hexafluoride. The MOU was designed to protect against gaps in worker protection at NRC-licensed facilities where OSHA also has health and safety jurisdiction. In 2013, OSHA and the NRC signed a revised MOU. Under the 2013 MOU, the NRC has responsibility for radiation hazards produced by radioactive materials; chemical hazards produced by radioactive materials; and NRC facility conditions that affect the safety of radioactive materials and, thus, present an increased radiation risk to workers. OSHA has responsibility under the MOU for facility conditions that result in occupational hazards that do not involve the use of licensed radioactive materials.

As required by the USEC Privatization Act, in 1996 the NRC entered into an MOU with OSHA pertaining specifically to the uranium gaseous diffusion enrichment plants in Paducah, Kentucky, and Piketon, Ohio. The agencies agreed under this MOU that, in general, the NRC will apply its standards to working conditions involving radiological hazards, OSHA will apply its standards to working conditions involving non-radiological hazards, and both agencies will apply their standards to conditions involving a combination of hazards.

## **8. Department of Transportation**

The U.S. Department of Transportation (DOT) and the NRC share responsibilities for the safe and secure transportation of radioactive materials. The NRC evaluates design and performance standards for packages used to transport fissile and highly radioactive materials, and it also reviews applications for design approval of those packages. DOT, on the other hand, develops package safety standards and reviews package designs for less highly radioactive materials. DOT establishes routing and security requirements for highway shipments, and the NRC has imposed security requirements governing transport of certain classes of nuclear materials. The NRC's transportation requirements are directed at NRC licensees; DOT's transportation requirements are imposed on carriers and shippers of all hazardous classes of materials, including those being transported by NRC licensees.

## **9. Department of Justice**

### **a. Litigation**

NRC litigation almost always requires coordination with DOJ. Under the Administrative Orders Review Act (commonly called the Hobbs Act), the United States is a party to petitions for review challenging NRC licensing decisions or NRC regulations. DOJ attorneys represent the United States. The Hobbs Act also provides, however, for independent representation of the NRC by the NRC's own attorneys. In practice, this means that NRC attorneys, under the supervision of the NRC's Solicitor, write the briefs in Hobbs Act cases and argue the cases in the federal courts of appeals. DOJ typically joins in the NRC's briefs, except in the extremely rare circumstance where the Department views an NRC position as inconsistent with general government interests.

In non-Hobbs Act cases, DOJ attorneys normally take the lead role in litigation, with support by NRC attorneys. (These are cases, usually filed in federal district court, not involving NRC licensing or regulatory action, such as Federal Tort Claims actions, subpoena enforcement, personnel litigation, Freedom of Information Act cases, and, potentially, certain challenges to the NRC's issuance of exemptions from its regulations. These cases also include cases that should have been filed in the court of appeals under the Hobbs Act but were incorrectly filed in district court.) DOJ also represents the NRC in bankruptcy proceedings involving NRC licensees. This NRC support frequently entails drafting pleadings or motions, providing affidavits or other factual material, and generally keeping abreast of the litigation to ensure that the NRC's interests are protected.

If the NRC loses a case in federal court, the NRC's Solicitor works with the Solicitor General's office at DOJ to determine whether to accept the defeat or to appeal. The Solicitor General has the authority to determine whether the government will pursue an adverse district court decision to the court of appeals and whether the government will pursue an adverse court of appeals decision to the *en banc* (full) court of appeals or to the Supreme Court. In Hobbs Act cases where the NRC has independent litigating authority, the NRC can make its own appellate decisions, but traditionally it has acceded to the Solicitor General's view, absent extraordinary reasons to the contrary.

In enforcement cases where the NRC concludes a violation resulted from a person's deliberate misconduct, the NRC will refer the case to DOJ, so it can determine whether the person should be charged under criminal law. This scenario is discussed further below.

The NRC's Solicitor also works with the Department of Justice and the Solicitor General in formulating the views of the United States, as presented in court, on issues in which the NRC may have an interest, including federal preemption, administrative law, and the National Environmental Policy Act.

**b. Criminal Investigations**

The NRC's investigatory arms frequently interact with DOJ personnel. The NRC has authority to revoke or suspend licenses, impose civil penalties, and take other civil actions for willful wrongdoing.

The NRC's Office of Investigations, which investigates allegations of wrongdoing by employees of NRC applicants and licensees, as well as by their contractors, normally interacts with the General Litigation Section of the Criminal Division at DOJ Headquarters and with U.S. Attorneys' Offices.

The relationship between DOJ and the NRC is detailed in an MOU, which obligates DOJ to communicate to the NRC health and safety information that it acquires or, if such information is confidential grand jury material, to attempt to gain judicial authorization to provide the information to the NRC. For its part, the NRC (through the Office of Investigations) is obligated to notify DOJ of suspected criminal violations in accordance with the MOU's procedures. Where NRC activities may affect DOJ actions, coordination is required. Although the NRC may take action on a health and safety problem without notifying DOJ if the urgency of the matter so requires, it normally advises DOJ in advance and the two agencies consult. DOJ's requests for NRC investigative and technical assistance are directed to the Director of the Office of Investigations.

Pursuant to the Inspector General Act, the Office of the Inspector General (IG) reports to DOJ whenever it has reasonable grounds to believe that an NRC employee or contractor has violated federal law. The IG refers cases for review for possible criminal prosecution to the U.S. Attorney's Office in the geographical location where the potential violation occurred. When DOJ desires support from the IG for investigations or grand jury work, the request is made directly to the IG.

**c. Preemption Authority with Respect to Firearms**

Section 653 of the Energy Policy Act of 2005 amended the Atomic Energy Act to add a new Section 161A, which provides the Commission with authority to preempt state, local, and certain federal firearms laws and regulations that would prevent the security personnel of designated licensees from having access to certain weapons and ammunition needed to protect their facilities. This authority first became effective on September 11, 2009, when the Commission issued Firearms Guidelines in the *Federal Register* with the approval of the Attorney General. In the ensuing years, these Firearms Guidelines have been revised on multiple occasions, most recently in March 2019. Consistent with the Firearms Guidelines, the Commission has approved authorization for use of preemption authority by certain facilities in Virginia, New York, and California.

## **10. Federal Energy Regulatory Commission**

The Federal Energy Regulatory Commission (FERC) is an independent agency, headed by a five-member Commission. FERC is responsible for regulating the interstate transmission of electricity, natural gas, and oil, as well as hydropower projects. Regarding the transmission of electricity, FERC focuses on reliability, integrity, security, and operation of the Bulk Power System (i.e., electric power grid) for the United States.

The availability of alternating current (AC) electrical power is essential for the safe operation and accident recovery of commercial nuclear power plants. Offsite power sources normally supply this essential power from the electrical grid to which the nuclear power plant is connected. Offsite power is the preferred power source for safe shutdown of nuclear power plants.

Unavailability of power can have a significant adverse impact on a nuclear power plant's ability to achieve and maintain safe-shutdown conditions. It is therefore important that, in the event a plant loses offsite power, highly reliable onsite AC electrical power be available as a back-up.

In response to an August 2003 event involving the largest power outage in U.S. history (occurring in the Northeastern United States and also in parts of Canada), the U.S. nuclear industry developed protocols between each nuclear power plant and its transmission system operator (TSO), independent system operator (ISO), or reliability coordinator/authority (RC/RA). The use of nuclear power plant/TSO protocols and analysis tools by TSOs assist nuclear power plants in monitoring grid conditions for consideration in maintenance risk assessments and any impending challenges to the offsite power systems.

Because the NRC and FERC have a common interest in ensuring the reliability of the Bulk Power System to meet their respective missions, the agencies entered into a Memorandum of Agreement in 2004. The intent of the Memorandum of Agreement is to facilitate a continuing and cooperative relationship in the exchange of experience, information, and data related to the reliability of the U.S. bulk electricity supply. Since 2004, the Memorandum of Agreement has been updated and renewed to further clarify and strengthen collaboration between the NRC and FERC.

The Energy Policy Act of 2005 gave FERC certain regulatory authorities with respect to all U.S. electric generating facilities, including nuclear power plants. Among these authorities, FERC was authorized to establish and oversee an electric reliability organization. In 2006, FERC certified the North American Electric Reliability Corporation (NERC). NERC is an international, independent, self-regulating, not-for-profit organization whose mission is to ensure the reliability of the Bulk Power System in North America by enforcing mandatory electric reliability rules on all users, owners, and operators of the nation's transmission system.

NERC is responsible for developing and enforcing Reliability Standards, and also for assessing and reporting on the reliability and adequacy of the North American Bulk Power System and Critical Infrastructure Protection Reliability Standards. Among these its responsibilities, NERC is charged with assessing the impacts of cyberattacks on electric grid reliability.

The NRC and NERC each have responsibility for establishing and enforcing cybersecurity requirements at commercial nuclear power plants operating in the U.S. The NRC's primary focus is on the prevention of radiological sabotage, and NERC's primary focus is on the reliability of the Bulk Power System.

Recognizing their mutual responsibilities, the NRC and NERC entered into an MOU in 2007. The intent of the MOU is to coordinate the roles and responsibilities of each organization as they relate to the application of their respective cybersecurity requirements for protection of digital assets at commercial nuclear power plants operating in the U.S. The NRC and NERC periodically review and update the MOU as needed.

Since 2004, the NRC and FERC have held approximately 10 joint Commission meetings on electric grid stability and offsite power issues. In addition, the NRC and FERC staffs meet quarterly to share information on ongoing issues and activities. Typical meeting topics include:

- Geomagnetic Disturbances findings, developments and recent FERC orders;
- Nuclear plant trips related to grid perturbations;
- NRC concerns pertaining to offsite power systems;
- Physical protection for switchyards at nuclear power plants;
- NERC 5-Year Review of Grid Reliability Standards; and
- Status of new reactors and decommissioning plans of operating reactors.

The NRC also interacts with FERC on issues related to dam safety. The NRC contracts with FERC to inspect the dams at nuclear facilities that fall under the Federal Guidelines for Dam Safety. In addition, the NRC interacts with FERC on FERC-regulated dams that may impact commercial nuclear power plants. The NRC and FERC have interacted extensively regarding the FERC-regulated dams near the Oconee nuclear power plant. Additional interactions with FERC and other government agencies (in particular the U.S. Army Corps of Engineers) are ongoing as a result of the flooding reevaluations performed in response to the events at Fukushima.

In June 2018, the NRC and FERC entered into an MOU relating to critical energy/electric infrastructure information (CEII). CEII includes information relating to proposed or existing energy infrastructure projects that could be useful to a person in planning an attack. The Fixing America's Surface Transportation Act (FAST Act) provided FERC with the authority and responsibility to "designate" as CEII not only its own information but also other federal agencies' information. The Act made information designated by FERC as CEII mandatorily exempt from public disclosure under the Freedom of Information Act. The NRC/FERC MOU sets forth procedures for the NRC to obtain FERC's designation of NRC information as CEII in the event of a FOIA request or other potential trigger.

Finally, the NRC participates in and supports investigations of electric power grid issues that may emanate from commercial nuclear power plant shutdowns or result in the loss of power to a nuclear power plant.

## **11. Office of Government Ethics**

NRC employees are subject to government-wide ethics laws, as well as to regulations and guidance issued by the Office of Government Ethics (OGE). The NRC's General Counsel serves as our Designated Agency Ethics Official (DAEO) and, in that role, is responsible for

overseeing the NRC's ethics program. The Assistant General Counsel for Legal Counsel, Legislation, and Special Projects serves as the NRC's Alternate DAEO. In addition, certain staff in the Office of the General Counsel, along with the NRC's four Regional Counsels, serve as Deputy Ethics Officials. These employees (in addition to the DAEO and Alternate DAEO) are the only NRC employees that are authorized to provide official ethics advice. These employees also review both public and confidential financial-disclosure reports submitted by many NRC employees. (About half of the NRC's employees must file either a public or confidential report.) OGE provides the final certification of all reports submitted by Presidential appointees, which at the NRC includes the Commissioners and the Inspector General.

## **12. Office of Personnel Management**

Under the Atomic Energy Act, the NRC is required to follow generally applicable civil service requirements, except as may be necessary to accomplish its mission. The NRC, however, handles its own recruitment efforts.

In addition, the NRC has some limited flexibility to adjust salaries to fulfill the agency mission. For example, resident inspectors at nuclear power plants are paid according to a schedule that recognizes the demands of their position. With regard to the salaries of Senior Executive Service (SES) members, however, OPM requirements are fully binding.

## **13. The Intelligence Community**

The NRC regularly consults with and receives information from the 17 federal organizations that make up the federal intelligence community. The NRC works with these organizations on a wide range of issues pertaining to the NRC's regulatory responsibilities.

### **B. State Governments**

At the NRC, interactions with the states are the responsibility of the Office of Nuclear Material Safety and Safeguards.

The Atomic Energy Act gave the NRC preemptive authority over most regulation of materials specified in the Atomic Energy Act. (Later, the Clean Air Act gave the states some authority, reconfirmed by Congress in 1990, to cover air emissions of radionuclides.) As a result, the general rule is that nuclear safety, like airline safety, is in the exclusive province of the federal government, and cannot be regulated by the states. Thus, a state law that attempted to set nuclear safety standards for Atomic Energy Act radioactive material would be voided by the courts. However, the courts generally will not overturn a state law that regulates nuclear energy for purposes other than health and safety or common defense and security, such as economics, unless it conflicts with an NRC requirement.

The NRC's Solicitor works with DOJ, in consultation with the Commission, to determine whether any state or municipal law is preempted by the Atomic Energy Act. The Commission may elect to monitor or participate with DOJ in litigation challenging such laws on preemption grounds. Typically, such participation is as a third party in litigation between states and parties asserting preemption defenses to state regulation. For example, the NRC joined DOJ in an *amicus curiae* brief on behalf of the United States in *Virginia Uranium, Inc. v. Warren*, a preemption case decided by the U.S. Supreme Court in 2019. The Solicitor may also communicate with states or municipalities to warn them that, in the NRC's view, contemplated action is preempted.

The 1959 Federal-State Amendment added Section 274 to the Atomic Energy Act, to establish a system for the NRC to enter into agreements that allow the NRC to relinquish regulatory authority, and states to assume regulatory authority, over certain types of Atomic Energy Act radioactive materials. The NRC may not relinquish authority over common defense and security, guarding against the loss or diversion of special nuclear material, or the protection of restricted data. The NRC also maintains regulatory authority over (1) specific types of facilities such as reactors, fuel reprocessing and uranium enrichment facilities; (2) imports and exports; (3) critical-mass quantities of special nuclear material; (4) high-level waste disposal; (5) federal facilities; and (6) certain other excepted areas of exclusive federal jurisdiction, such as federally recognized tribal reservations. When a state applies to become an Agreement State, the NRC reviews the state's regulatory program to ensure it is both adequate to protect public health and safety and compatible in all other respects with the NRC's own program. In addition, since the Atomic Energy Act does not allow the NRC to relinquish the authority to protect the common defense and security to an Agreement State, the Commission retains the authority to impose security requirements on Agreement State licensees.

There are now 39 Agreement States. The Agreement State process can take 3 to 5 years. Notwithstanding that Agreement States receive no federal funding to support their regulatory programs, only one state (Idaho) has ever fully given up Agreement State status after assuming it. One other state, New Mexico, gave back to the NRC the licensing and regulation of uranium mills and mill tailings. Other states have returned their programs for review of commercial sealed sources and devices. In general, the Agreement States fund their regulatory programs through state-imposed licensing fees.

Some states have shown a desire to become involved in matters relating to nuclear power plants, an area regarded as the NRC's sole prerogative. Responding to this trend, the NRC issued a policy statement in 1989 declaring its intent to cooperate with states in the area of nuclear safety by keeping states informed of matters of interest to them. The NRC also stated that it would consider state proposals under which their officials might participate in NRC inspection activities, pursuant to an MOU between the state and the NRC. The policy statement makes clear that states must channel all their contacts with the NRC through a single State Liaison Officer, appointed by the Governor, and that the states are authorized only to observe NRC inspections or conduct inspections on behalf of the NRC, not to conduct their own independent health and safety inspections. (The policy statement was revised in 1992 to allow representatives in adjacent states to accompany NRC inspections at licensed facilities.) More recently, this state interest has extended to plants which have been shut down and are now undergoing decommissioning.

Agreement States are responsible for administering their programs under state statutes and funding, and in recent years some states have experienced budget and fiscal shortfalls in their programs. Under the Atomic Energy Act, the NRC does not provide funding for the administration of Agreement State programs. The NRC staff does monitor the fiscal effects on the performance of Agreement State programs under its oversight role and through the Integrated Materials Performance Evaluation Program review process. Such effects include difficulty in hiring, training, and retaining new Agreement State program staff and the potential return of Sealed Source and Device Evaluation Authority, or the Agreement State authority generally, to the NRC. The NRC will continue to exchange technical information with Agreement States and provide assistance on questions of regulatory policy and interpretation.

The NRC also provides training assistance to Agreement States, and Agreement State staff can attend NRC training courses. Under existing policy, the NRC funds travel and per diem costs for State attendees at NRC-sponsored courses.

### **C. Tribal Governments**

The NRC consults and cooperates with Indian Tribal governments in a manner consistent with the spirit and intent of Executive Order 13175 (issued by President Clinton in 2000) on Tribal consultation. These practices ensure that the rights of Tribal governments are respected and that the NRC operates in a government-to-government relationship with federally recognized Native American Tribes. In 2010, the NRC implemented an internal agencywide protocol for government-to-government interaction with Tribal governments in response to Commission direction. The Office of Nuclear Material Safety and Safeguards, which is responsible for coordination of NRC-related matters with Native American Tribes, maintains government-to-government communications with federally recognized tribes and tribal organizations, and it takes affirmative steps to identify tribes that may be affected by agency actions. Additionally, under 10 C.F.R. § 2.315(c), Indian Tribes are afforded the same opportunity as state and local governments to participate in NRC adjudicatory hearings as non-party participants.

Interactions with Native American Tribal officials usually involve officials whose tribes have a current or historical presence in the vicinity of a facility or site licensed by the NRC. Native American issues have historically been addressed on a case-by-case basis. In many cases, the NRC and Tribes have engaged in exchanges of information on specific issues related to the NRC's policy and regulatory authority. In recent years, Tribal interest has been primarily in the areas of uranium recovery, power reactor licensing, and the storage, transportation, disposal, and reclamation of high- and low-level radioactive waste. The NRC also maintains liaison with the National Congress of American Indians.

In 2012, the NRC solicited public comments on its draft Tribal Protocol Manual and suggestions on the development of an NRC Tribal Policy Statement. The NRC published its final Tribal Policy Statement in the *Federal Register* in 2017 and issued its Tribal Protocol Manual in 2018. These documents are intended to facilitate effective consultations and interactions between the NRC and Native American Tribes related to activities within the NRC's jurisdiction. These documents also provide agencywide guidelines to help ensure consistency in all NRC program and regional office consultation and coordination practices.

### **D. Congress**

Unlike most federal agencies, the NRC's relations with its oversight committees are in part governed by statute. The NRC is required to keep these committees fully and currently informed regarding matters in the agency's jurisdiction, and the NRC must furnish the committees any information requested by them. As a result of these provisions, the oversight committees can request and receive for committee use some predecisional agency documents that have not been released to the general public.

The NRC's Office of Congressional Affairs is the conduit for NRC communications with Congress. Members of the Commission and NRC senior staff regularly work with the Office of Congressional Affairs to provide information to Congress and reply to inquiries from various committees of the House and the Senate and to Members of Congress who are interested in aspects of NRC responsibilities.

As a general principle, the NRC attempts to balance the need to keep Congress informed with the need to safeguard legitimate NRC interests, such as maintaining the independence of NRC decisionmaking and the integrity of ongoing investigatory and adjudicatory proceedings. Historically, the NRC has often been successful in negotiating and reaching accommodations with Congressional requesters to protect these NRC interests while providing Congress the information it needs.

In the early 2010s, however, Congressional requests for NRC information became a more complicated matter. In 2013, in an attempt to clarify agency policy in this area and address concerns regarding the potential Freedom of Information Act implications of certain types of Congressional requests, the Commission comprehensively revised the pertinent chapter of its Internal Commission Procedures. However, a number of Members of Congress objected to the revisions. As a result, the Energy and Water Development Appropriations Acts in each fiscal year since 2014 has included a provision requiring the NRC to adhere to the prior (July 6, 2011) version of this Internal Commission Procedures chapter when responding to Congressional information requests.

### **1. Senate Oversight Committees**

In the Senate, the Committee on Environment and Public Works exercises jurisdiction over domestic nuclear regulatory activities. It considers nominations of Commissioners and the Inspector General. Within the Committee, the Subcommittee on Clean Air and Nuclear Safety has been delegated responsibility for legislation and oversight related to the NRC.

The Senate Energy and Natural Resources Committee shares jurisdiction over nuclear waste issues with the Environment and Public Works Committee. In addition, it has jurisdiction over utility policy and nuclear insurance programs.

### **2. House Oversight Committees**

In the House, jurisdiction over domestic nuclear regulatory activities is vested in the Committee on Energy and Commerce, which further delegated responsibility between the Subcommittee on Energy and the Subcommittee on Environment and Climate Change.

### **3. Other Relevant Committees**

In addition to these committees, a number of other Congressional committees have jurisdiction over some aspect of NRC activities. The most important of these are as follows:

- a. **Appropriations**: The NRC's annual appropriations are included with the annual appropriations bill for energy and water development activities. The bill is prepared by the Subcommittee on Energy and Water Development, and Related Agencies of the House Appropriations Committee and the Subcommittee on Energy and Water Development of the Senate Appropriations Committee. These subcommittees expect to be kept fully informed of major Commission actions and initiatives.
- b. **International Affairs**: Matters concerning the international aspects of atomic energy fall within the jurisdictions of the Senate Committee on Foreign Relations and the House Committee on Foreign Affairs. In the Senate, the Committee on Homeland Security and

Governmental Affairs shares responsibilities with the Foreign Relations Committee for the organization and management of United States nuclear export policy.

- c. Research: In the House, the Subcommittee on Energy of the Committee on Science, Space, and Technology shares jurisdiction over the NRC's research program with the NRC's oversight subcommittees (the Energy and Environment and Climate Change subcommittees of the Committee on Energy and Commerce).
- d. General Government Operations: Both the House and Senate have committees with jurisdiction over general government operations. These committees are the Senate Committee on Homeland Security and Governmental Affairs and the House Committee on Oversight and Reform. In addition to their legislative authority over government reorganizations and the creation of new government agencies, these committees have broad mandates to study the "economy and efficiency" of federal activities, giving them broad oversight responsibility over all government programs. They also examine all reports by the Government Accountability Office, as well as comments on those reports. All agency comments on Government Accountability Office reports are to be transmitted to these two committees by federal agencies.
- e. Special Subcommittees: In the House, most major legislative committees, including the NRC's oversight committee, have a special investigative subcommittee. Thus, the Committee on Energy and Commerce has an Oversight and Investigations Subcommittee, with general investigative and oversight powers over all of the matters within the jurisdiction of the main committee. The subcommittee does not have responsibility for legislation relating to the NRC. The Senate Environment and Public Works Committee also has an Oversight subcommittee (the Subcommittee on Superfund, Waste Management, and Regulatory Oversight).

# Major Recent Activities

<b>Top Operational Items</b> .....	iv
<b>Operating Reactors</b>	
Foreign Ownership, Control, or Domination (FOCD) (NMSS) .....	MRA 01
Financial Qualification Requirements (NMSS) .....	MRA 02
Flooding Hazard Reevaluations (NRR) .....	MRA 03
Operating Reactor Licensing (NRR) .....	MRA 04
Subsequent License Renewal Reviews (NRR) .....	MRA 05
Continuous Improvement of the Reactor Oversight Process (ROP) (NRR) .....	MRA 06
Agency Efforts to Risk Inform the Regulatory Framework for Operating Reactors (NRR) .....	MRA 07
A Review of the Trend in Reactor Oversight Process (ROP) Inspection Findings (NRR) .....	MRA 08
Baffle-Former Bolts (or Baffle Bolts) (NRR) .....	MRA 09
Accident Tolerant Fuel (ATF) (NRR) .....	MRA 10
Digital Instrumentation and Controls (I&C) (NRR) .....	MRA 11
NextEra and Entergy Exit from the Nuclear Energy Institute (NRR) .....	MRA 12
<b>Operating Reactors – Site Specific</b>	
Seabrook Alkali-Silica Reaction (ASR) (NRR) .....	MRA 13
Algonquin Incremental Market Natural Gas Transmission Pipeline and Indian Point (AIM&IP) (NRR) .....	MRA 14
<b>Reactor Decommissioning</b>	
Reactor Decommissioning Activities (NMSS) .....	MRA 15
San Onofre Nuclear Generating Station (SONGS) Decommissioning (NMSS) .....	MRA 16
Oyster Creek, Pilgrim, and Indian Point License Transfers (NRR) .....	MRA 17
Diablo Canyon Decommissioning (NMSS) .....	MRA 18
<b>New Reactors</b>	
Small Modular Reactor (SMR) Application Reviews (NRR) .....	MRA 19
Large Light Water Reactor (LLWR) Application Reviews (NRR) .....	MRA 20
Licensing Advanced Reactor Technologies (NRR) .....	MRA 21
New Reactor Construction (NRR) .....	MRA 22
Mandatory Hearings Conducted by the Commission (OCAA) .....	MRA 23
Procedures for Hearings on Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) (OGC) .....	MRA 24
Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) (NRR) .....	MRA 25
Bellefonte - License Transfer Dispute between TVA and Nuclear development (NRR) .....	MRA 26
<b>Fukushima</b>	
Fukushima Lessons Learned (NRR) .....	MRA 27
Crediting FLEX in Regulatory Actions (NRR) .....	MRA 28
<b>Fuel Cycle &amp; Materials</b>	
Management of Spent Fuel (RES) .....	MRA 29

Consolidated Interim Storage Facilities: Holtec (HI-STORE) and Interim Storage Partners (ISP/WCS) Consolidated Interim Storage Facility Applications (NMSS) .....	MRA 30
DOE's Interpretation of High-Level Waste (HLW) Definition (NMSS) .....	MRA 31
Uranium Recovery (NMSS) .....	MRA 32
Agreement State Program (NMSS) .....	MRA 33
Source Security and Accountability (NMSS) .....	MRA 34
Medical Use of Byproduct Material (NMSS) .....	MRA 35
Training and Experience Requirements for Authorized Users (NMSS) .....	MRA 36
Greater-Than-Class-C (GTCC) Radioactive Waste (NMSS).....	MRA 37
High Assay Low-Enriched Uranium (HALEU) Fuel (NMSS) .....	MRA 38
Licensing and Oversight Activities for Molybdenum-99 Facilities (NRR) .....	MRA 39
Transportation of Spent Nuclear Fuel (NMSS) .....	MRA 40
Westinghouse Issues (NMSS) .....	MRA 41
Independent Spent Fuel Storage Installation (ISFSI) Inspection Program Changes (NMSS) .....	MRA 42
Centrus Licensing Activities (NMSS) .....	MRA 43
Very Low-Level Waste Disposal (NMSS) .....	MRA 44
Fuel Facilities (NMSS) .....	MRA 45

### **Security & Emergency Response**

Cyber Security (NSIR).....	MRA 46
Force-on-Force Enhancements (NSIR) .....	MRA 47
Protecting Nuclear Power Plants from Electromagnetic Pulses (EMPs) and Response to Electromagnetic Defense Task Force (EDTF) Report (NRR) .....	MRA 48
Potential Updates to Regulatory Guide (RG) 5.69 – “Guidance for the Application of the Radiological Sabotage Design-Basis Threat for Nuclear Power Reactors” (NSIR) .....	MRA 49
Unmanned Aerial Systems (UASs) (NSIR) .....	MRA 50

### **High-Level Waste**

Yucca Mountain / Nuclear Waste Fund (NMSS).....	MRA 51
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### **Research Activities**

External Engagements with Research Organizations (RES).....	MRA 52
Full-Scope Site Level 3 Probabilistic Risk Assessment (PRA) Project (RES) .....	MRA 53
Fire Safety Research (RES) .....	MRA 54
State-of-the-Art Reactor Consequence (SOARCA) Analyses (RES) .....	MRA 55

### **Rulemakings**

Rulemaking Processes (NMSS) .....	MRA 56
Cumulative Effects of Regulation (CER) (NMSS) .....	MRA 57
Regulatory Analysis, Backfitting, Use of Qualitative Factors in Agency Rulemaking (NMSS) .....	MRA 58
Improving Cost Estimating for Implementing New Regulations (NMSS) .....	MRA 59
Power Reactor Decommissioning Rulemaking (NMSS) .....	MRA 60
Emergency Preparedness for Small Modular Reactors and Other New Technologies Rulemaking (NMSS) .....	MRA 61
Part 50/52 Clean-Up Rule – Alignment of Licensing Processes and Lessons Learned from New Reactor Licensing (NRR) .....	MRA 62

Part 53 Rule - Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors (NRR) .....	MRA 63
Enhanced Weapons Rulemaking (NMSS).....	MRA 64
Advanced Reactor Physical Security Rulemaking (NMSS) .....	MRA 65
<b>Requests for Additional Information (RAIs) (NRR) .....</b>	<b>MRA 66</b>
<b>International Issues</b>	
International Programs (OIP).....	MRA 67
Exports of High Enriched Uranium (HEU) to Research and Test Reactors (NMSS/OIP) .....	MRA 68
Impact on China Policy for Exports Authorized by NRC (OIP) .....	MRA 69
Memorandum of Cooperation with the Canadian Nuclear Safety Commission (OIP) .....	MRA 70
<b>NRC Budget Issues</b>	
How the NRC Budget Formulation Process Works (OCFO) .....	MRA 71
Fee Recovery (OCFO) .....	MRA 72
Government Accountability Office (GAO) Engagements on the NRC Budget Process (OCFO) .....	MRA 73
Corporate Support Reduction (OCFO) .....	MRA 74
Integrated University Program (RES) .....	MRA 75
<b>NRC Workplace</b>	
Transformation (OEDO) .....	MRA 76
Strategic Workforce Planning (OCHCO) .....	MRA 77
Staffing, Retention, Recruiting, and Professional Development (OCHCO) .....	MRA 78
Policies for Equal Employment Opportunity (EEO) and Diversity (SBCR) .....	MRA 79
The NRC's Differing Views Program (OE) .....	MRA 80
NRC Whistleblower Protections (OCHCO) .....	MRA 81
Nuclear Energy Innovation and Modernization Act (NEIMA) (OEDO) .....	MRA 82
Nuclear Energy Innovation Capabilities Act (NEICA) (OEDO) .....	MRA 83
Foundations for Evidence-Based Policymaking Act (OEDO) .....	MRA 84
White Flint Campus (ADM).....	MRA 85
Social Media (OPA).....	MRA 86
<b>NRC's Response to the COVID-19 Public Health Emergency</b>	
NRC Operational Impact (OEDO).....	MRA 87
Reactors (NRR).....	MRA 88
Materials (NMSS) .....	MRA 89
Inspections (NRR/NMSS) .....	MRA 90
<b>Compliance with Legislation Concerning Congressional Requests for Documents (OGC) .....</b>	
<b>MRA 91</b>	
<b>Attachment</b>	
1) U.S. Nuclear Regulatory Commission Rulemaking Actions Planned as of October 27, 2020.	

**The following list identifies the agency's top operational items:**

- Sustaining mission effectiveness and protecting staff safety throughout the COVID-19 public health emergency and moving forward. Refer to these major recent activities on NRC's Response to the COVID-19 Public Health Emergency:
  - MRA 87 – NRC Operational Impact
  - MRA 88 – Reactors
  - MRA 89 – Materials
  - MRA 90 – Inspections
  
- Transitioning oversight of Vogtle Unit 3 from construction to operation. Refer to this major recent activity:
  - MRA 22 – New Reactor Construction
  
- Preparing for advanced technologies in materials and reactor programs. Refer to these major recent activities:
  - MRA 21 – Licensing Advanced Reactor Technologies
  - MRA 63 – Part 53 Rule - Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors
  - MRA 10 – Accident Tolerant Fuel
  - MRA 11 – Digital Instrumentation and Controls
  
- Sustaining transformation efforts to include positive changes in agency culture that promote diversity, innovation, and creativity. Refer to these major recent activities:
  - MRA 76 – Transformation
  - MRA 79 – Policies for Equal Employment Opportunity (EEO) and Diversity
  
- Recruiting, hiring, developing, and retaining high quality employees and maintaining focus on knowledge management. Refer to these major recent activities:
  - MRA 78 – Staffing, Retention, Recruiting, and Professional Development
  - MRA 77 – Strategic Workforce Planning

### **Foreign Ownership, Control, or Domination (FOCD) (NMSS)**

The Atomic Energy Act of 1954, as amended (AEA), prohibits the issuance of a license for a utilization or production facility for industrial or commercial purposes or for medical therapy or research and development to “any corporation or other entity if the Commission knows or has reason to believe it is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government.” Section 50.38 of Title 10 of the Code of Federal Regulations (CFR) codifies this requirement. Accordingly, the NRC conducts foreign ownership, control, or domination (FOCD) reviews of applications for such licenses, including licenses for new facilities, license renewal, and approval of direct or indirect transfers of control of facility operating licenses to verify that sufficient information has been provided to satisfy the AEA and 10 CFR 50.38 requirements.

The NRC staff follows the Commission-approved Standard Review Plan (SRP) on FOCD, dated June 1999 (64 FR 52355) to guide its evaluations of the different types of license applications.

In recent years, there has been an increase in the number of licensing actions submitted to the NRC for review where issues related to FOCD exist. One cause is likely due to the increased globalization of economic activity and associated added complexity of the corporate arrangements. In response, the NRC’s reviews of FOCD issues have become more numerous and detailed.

On March 11, 2013, in the SRM for SECY-12-0168, “Calvert Cliffs 3 Nuclear Project, LLC & UniStar Nuclear Operating Services, LLC (Calvert Cliffs Nuclear Plant, Unit 3), Docket No. 52-016-COL, Petition for Review of LBP-12-19” (ADAMS Accession No. ML13070A150), the Commission directed the staff to provide a fresh assessment on issues relating to foreign ownership including recommendations on any proposed modifications to guidance or practice on FOCD that may be warranted.

The NRC staff solicited external stakeholder input during the development of its response and recommended that the NRC revise the FOCD SRP and develop regulatory guidance for graded negotiation action plan (NAP) criteria based on the level of FOCD presented by the applicant.

On May 4, 2015, in the SRM for SECY-14-0089, “Fresh Assessment of Foreign Ownership, Control, or Domination of Utilization Facilities” (ADAMS Accession No. ML15124A940), the Commission approved the staff’s recommendation and directed the staff to “revise the [FOCD SRP] and develop a regulatory guide to include graded [NAP] criteria that would mitigate the potential for control or domination of licensee decision-making by a foreign entity.” The Commission directed that the FOCD SRP and RG should also allow for the consideration of site-specific criteria, as necessary; affirm the use of license conditions to incorporate NAPs and the staff’s “totality of facts” review approach; and provide additional guidance in analyzing foreign financing. The final revised FOCD SRP and RG are currently before the Commission (COMSECY-16-0027, ADAMS Accession No. ML16288A720).

In SRM-SECY-14-0089, the Commission further directed the staff to “provide a SECY paper to the Commission presenting options for developing a formalized method of performing inimicality reviews,” including “procedures for consulting with the intelligence community.” This paper is also with the Commission (SECY-16-0056, ADAMS Accession No. ML15351A101).

Separately, and as a part of the decommissioning proposed rule, “Regulatory Improvements for Production and Utilization Facilities Transitioning to Decommissioning,” the staff is contemplating changes in NRC regulations that would specify when the FOCD prohibition at 10 CFR 50.38 does not apply to an entity seeking a license for a facility in decommissioning and when a facility is no longer a production or utilization facility. The proposed rule is pending before the Commission (SECY-18-0055, ADAMS Accession No. ML18012A019).

## **Financial Qualifications Requirements (NMSS)**

The NRC's primary tools for evaluating and ensuring safe operations at nuclear power reactors are its licensing and inspection and enforcement programs. Specifically, the NRC maintains a number of programs and processes that directly ensure safe plant construction, operation, and decommissioning, including detailed technical licensing reviews, the construction reactor oversight process, the reactor oversight process, the operating experience program, the vendor inspection program, and quality assurance inspections.

License holders and applicants must also demonstrate with reasonable assurance that financial resources will be available to safely construct, operate, and decommission a nuclear facility. This responsibility is established in the Atomic Energy Act of 1954, as amended, and is implemented in the present NRC regulations. The NRC staff conducts financial qualifications reviews of power and non-power reactors in accordance with guidance in NUREG-1577, Revision 1, "Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance," and NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," respectively.

The following licensing actions involve reviews of financial qualifications.

### **Initial Licensing (Construction Permits, Operating Licenses, and Combined Licenses): Reference 10 CFR 50.33; 10 CFR Part 50, Appendix C; 10 CFR 52.77.**

To demonstrate that the applicant possesses or has reasonable assurance of obtaining the funds necessary to cover costs, an application for a construction permit shall include estimates of the total construction costs of the facility and related fuel cycle costs, and shall indicate the source(s) of funds to cover these costs; an application for an operating license shall include estimates for total annual operating costs for each of the first five years of operation of the facility, and shall indicate the source(s) of funds to cover these costs; and an application for a combined license shall include both sets of information.

### **Transfers of Existing Licenses: Reference 10 CFR 50.33, 10 CFR 50.80, and 10 CFR Part 50, Appendix C**

A license transfer application must include as much of the information with respect to the financial qualifications of the proposed transferee as would be required if the application were for an initial license.

The Commission issued an SRM for SECY-13-0124, "Policy Options for Merchant (Non-Electric Utility) Plant Financial Qualifications" (ADAMS Accession No. ML14114A358), on April 24, 2014, directing the staff to engage in a rulemaking to amend financial qualifications demonstration requirements for nuclear plant license applicants, including license transfer applicants. The rulemaking proposes to amend the current reactor licensing financial qualifications requirements of "reasonable assurance" to a lesser review standard of "appears to be financially qualified" for construction and operation. These proposed changes to the financial qualifications requirements would not affect the NRC's decommissioning funding requirements. Under the "appears to be financially qualified" standard, the rulemaking would require the applicant to submit a plan for how it will proceed to finance the construction and operation of the facility to ensure that the applicant has both a well-articulated understanding of the size of the project it is undertaking and the financial capacity to obtain the necessary financing when the

applicant is ready to start construction or operations. In addition, the rulemaking would permit, for applicants with funding of 50 percent or less, the inclusion of a license condition to demonstrate that the licensee has obtained sufficient funding for construction and/or operations prior to the start of licensed activities, rather than at the time of licensing. Further, the rulemaking would clarify the information that applicants must submit for a license transfer for a facility in decommissioning in accordance with the intent of the NRC's decommissioning funding regulations.

The staff finalized the regulatory basis for the rulemaking in October 2016 (ADAMS Accession No. ML15322A185) and provided the draft proposed rule, "Financial Qualification Requirements for Reactor Licensing," including draft guidance and regulatory analysis, to the Commission in February 2018 (SECY-18-0026, ADAMS Accession No. ML17172A536). The proposed rule is currently before the Commission.

### **Flooding Hazard Reevaluations (NRR)**

The staff has completed all post-Fukushima flooding hazard reevaluation activities for operating power reactors associated with Near-Term Task Force (NTTF) Recommendation 2.1 (flooding), and notes that no additional regulatory actions concerning the flooding responses will be required.

On March 12, 2012, the staff issued a request for information under Title 10 of the *Code of Federal Regulations*, Section 50.54(f) (ADAMS Accession No. ML12053A340), hereafter referred to as the 50.54(f) letter. To address the flooding reevaluations discussed in Recommendation 2.1 of the NTTF report, enclosure 2 to the 50.54(f) letter asked licensees of operating power reactors to reevaluate the flooding hazards that could affect their sites.

In the staff requirements memorandum (SRM) for COMSECY-14-0037, "Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards" (ADAMS Accession No. ML15089A236), the Commission directed the staff to provide more detailed information on the status of the flooding hazard reevaluations and integrated assessments, as well as the Phase 1 and 2 guidance.

In COMSECY-15-0019, "Closure Plan for the Reevaluation of Flooding Hazards for Operating Nuclear Power Plants" (ADAMS Accession No. ML15153A105), the staff described an action plan for completing and closing the reevaluated flooding hazard activities described in the 50.54(f) letter. In the SRM for COMSECY-15-0019 (ADAMS Accession No. ML15209A682), the Commission approved the plan and directed the staff to keep the Commission informed of the progress on the implementation of the flooding hazard reevaluation action plan. Since then, the staff has kept the Commission informed via periodic formal status updates as well as routine agency communication mechanisms.

On August 13, 2020, the staff completed the final flood impact assessment related to the 50.54(f) letter. One site has an approved due date deferral until August 31, 2021. The staff noted in the NRC's deferral approval letter that, if the licensee decides to continue to operate past the announced shutdown date, the licensee would need to provide a flooding integrated assessment by August 31, 2021.

For several flooding reevaluations, the information in the licensees' submittals included voluntary safety enhancements that improved the site's ability to protect against and/or mitigate the impacts from a flooding event, including beyond-design-basis events. The licensees' submittals and voluntary safety enhancements supported the staff's conclusions in the various staff assessments that additional regulatory actions related to the reevaluated flooding hazards were not warranted at operating power reactor sites.

## **Operating Reactor Licensing (NRR)**

The NRC licenses all commercially-owned nuclear power plants that produce electricity in the United States. As part of the initial licensing process, an entity or individual submits an application to the NRC. The NRC staff reviews the submission to ensure the applicant's financial viability, that the applicant's assumptions are technically correct, and that the proposed activities will not adversely affect public health and safety or the environment. After the initial license is granted, the license may be amended, renewed, transferred, or otherwise modified, depending on activities that affect the reactor during its operating life. The primary focus of the staff's review is ensuring the continued health and safety of the public.

There are three main licensing actions and associated procedures managed by the Operating Reactor Licensing Program: license amendments, relief requests, and exemptions. These actions typically modify the licensing and/or design bases as described in the license or Final Safety Analysis Report, as updated. The Operating Reactor Licensing Program processes hundreds of these licensing action requests a year. To support the Operating Reactor Licensing Program, the NRC sponsors a Topical Report Program to increase the efficiency of the licensing process. For this program, the NRC staff performs a single review of a safety-related topic that can then be applied to multiple nuclear power plants.

The public plays an important role in the licensing process. To the extent possible, the NRC shares information provided by applicants or licensees with the public and makes its decisions publicly available. Consistent with Part 2 of Title 10 of the *Code of Federal Regulations* (10 CFR), for licensing actions that propose to modify the license, the public is notified of the action and provided the opportunity to request a hearing. Individuals or groups can raise legal arguments in an NRC Atomic Safety and Licensing Board hearing if they meet the requirements for requesting a hearing. The NRC has a group of Administrative Judges that conduct those hearings and render judgments that are appealable to the Commission, then to the U.S. Courts of Appeals, and from there to the U.S. Supreme Court. Also, the NRC Advisory Committee on Reactor Safeguards, a committee of independent nuclear experts that reports directly to the Commission, holds public meetings to discuss certain technical or safety issues related to operating reactors.

Any member of the public may raise potential health and safety issues in a petition to the NRC. This provision is contained in [10 CFR 2.206](#) and petitions submitted under this regulation are referred to as "2.206" petitions. If warranted, the NRC can take action to modify, suspend, or revoke a license, or take other appropriate enforcement action to resolve a safety issue identified in a 2.206 petition or through other means.

### **Key Licensing Initiatives**

NRR has recently instituted or completed several initiatives to enhance the Operating Reactor Licensing Program. These initiatives leverage existing licensing processes and resources as well as modern tools and approaches to enhance efficiency, effectiveness, predictability, and transparency. Some examples of focused improvement areas are discussed below:

- **Risk-informed licensing actions:** As detailed in SECY-17-0112 (ADAMS Accession No. ML17270A197) and in accordance with Commission direction in SRM-SECY-19-0036 (ADAMS Accession No. ML19183A408 and ML19319C832), the NRC staff is enhancing the integration of risk information into its regulatory decisionmaking practices and processes. For example, in June 2020, NRR issued Office Instruction LIC-206, Revision 1, "Integrated

Risk-Informed Decision Making for Licensing Reviews,” (ADAMS Accession No. ML19263A645) to provide additional guidance to the staff in integrating risk insights in licensing reviews. Use of LIC-206 aligns with the agencywide *Be riskSMART* initiative, which supports the advancement of consistent policies and guidance that give staff confidence in accepting well-managed risks in decisionmaking without compromising the NRC’s mission.

- Data-driven decisionmaking: The NRC staff are improving IT tools to make financial and workload information more readily available and increase staff’s capability to analyze information to support informed decision-making. For example, licensing dashboards utilizing the Mission Analytics Portal (MAP) data warehouse have improved access to licensing information. These dashboards use a combination of predictive and historical project information to display the current status of operating reactor licensing actions and measure the results of completed licensing actions against applicable performance measures. The staff is evaluating how these dashboards can be modified to provide more detailed externally facing information for licensees and external stakeholders, enabling greater transparency in the operating reactor licensing process.

In parallel with the MAP dashboard development, additional improvements are being implemented in NRR’s workload management system, the Replacement Reactor Program System (RRPS), to improve the accuracy of project information in RRPS and to enhance the project planning, tracking, and workload management processes. These efforts have also supported NRR in implementing relevant Nuclear Energy Innovation and Modernization Act (NEIMA) requirements, as well as enhancements to NRR’s fee validation process.

## **Workload Processes**

The NRC has specific performance goals and metrics for the Operating Reactor Licensing Program. The Operating Reactor Licensing Program is currently meeting the agency performance goals for the percentage of licensing actions and other licensing tasks completed within one year and the percentage of licensing actions and other licensing tasks completed within two years. The Operating Reactor Licensing Program is also meeting the applicable generic milestone schedules established in accordance with NEIMA. The NRC staff’s ability to meet these measures can be affected by emerging safety or security issues, or changes in a licensee’s plans. The staff has enhanced communications with licensees concerning the status of actions under review and has established internal goals to track adherence to initial schedules and resource estimates communicated to licensees.

While the staff does consider the current performance metrics appropriate to balance efficiency with safety, NRR has been working with the Office of the Executive Director for Operations to develop Congressional Budget Justification indicators that show more direct support for each of the safety/security strategies from the NRC’s FY 2018-2022 Strategic Plan. New indicators were developed and will be implemented in FY 2021. The new indicators incorporate NEIMA requirements and support improving efficiencies in schedules, resource utilization, and overall project management.

### **Subsequent License Renewal Reviews (NRR)**

The Atomic Energy Act of 1954, as amended (AEA), allows for licensing of nuclear power plants for an initial term not to exceed 40 years that “may be renewed upon the expiration of such period.” See AEA Section 103(c). As of January 2020, the NRC has issued renewed licenses for 94 reactor units, which are now authorized to operate an additional 20 years (for a total of 60 years of operation). There are no specific limitations in the AEA or NRC’s regulations on the number of times a license may be renewed. The NRC has, to date, received four applications for subsequent license renewal (SLR) for eight nuclear power plants, to extend the licenses for each of these facilities from 60 years to 80 years.

In December 2019, the NRC issued the first subsequently renewed licenses to Turkey Point Nuclear Generating Units 3 and 4. In March 2020, the staff issued subsequently renewed licenses for Peach Bottom Units 2 and 3. As of September 2020, administrative adjudications remain pending associated with the Turkey Point and Peach Bottom SLR applications.

The staff has completed its environmental and safety reviews of an SLR application for Surry Units 1 and 2; license issuance is on hold until the licensee resolves issues related to the Coastal Zone Management Act with the Commonwealth of Virginia. The NRC staff completed its safety and environmental reviews for each of these applications in accordance within the established 18-month schedule and estimated resources.

On August 24, 2020, Virginia Electric and Power Company (Dominion Energy or Dominion) submitted an SLR application for North Anna Power Station Units 1 and 2 (ADAMS Accession No. ML20246G703). The staff completed its acceptance review of the application on September 30, 2020, and notified Dominion via email (ADAMS Accession No. ML20281A622) that the application was acceptable for docketing. On October 13, the staff issued the formal acceptance letter for the North Anna Subsequent License Renewal Application (ADAMS Accession No. ML20258A284).

On September 24, 2019, Duke Energy submitted a letter notifying the NRC of its intent to submit an SLR application for Oconee Units 1, 2, and 3, in 2021. As announced in a press release on September 19, 2019, Duke Energy has stated that it intends to seek subsequent renewed licenses for its entire fleet.

Additionally, the staff has received verbal indications from at least two applicants who are planning to submit SLR applications in calendar year 2021.

For each SLR application, the NRC staff’s review focuses on the licensee’s management of the effects of aging in passive, long-lived systems and components during the period of extended operation. The process includes a safety review, an environmental review, inspection activities, and an independent review by the Advisory Committee on Reactor Safeguards (ACRS). The overall license renewal review takes about 18 months to complete after the SLR application is accepted and docketed for review, although this schedule may be extended if a hearing is held on the application.

The NRC’s environmental review evaluates the environmental impacts of subsequent license renewal and other energy alternatives in accordance with the National Environmental Policy Act and must be completed before the NRC makes a license renewal decision. To improve the efficiency of reviews, the staff has developed a generic environmental impact statement (EIS) for license renewal, which the Commission has held is applicable to subsequent license renewal

(a conclusion that, at the end of 2020, is being reviewed in court). For the environmental review of initial and subsequent license renewal applications, the staff issues a plant-specific supplemental EIS, in which it reviews plant-specific impacts and any new and significant information related to findings in the generic EIS.

To support the safety review of SLR applications, the staff has developed several guidance documents to address the unique aging management needs for SLR:

- NUREG-2191, Volumes 1 and 2, “Generic Aging Lessons Learned for Subsequent License Renewal Report” (ADAMS Accession No. ML17187A031 and ML17187A204).
- NUREG-2192, “Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants” (ADAMS Accession No. ML17188A158).
- NUREG-2221, “Technical Bases for Changes in the Subsequent License Renewal Guidance Documents NUREG-2191 and NUREG-2192” (ADAMS Accession No. ML17362A126)
- NUREG-2222, “Disposition of Public Comments on the Draft Subsequent License Renewal Guidance Documents NUREG-2191 and NUREG-2192” (ADAMS Accession No. ML17362A143).

These guidance documents were developed by making the necessary revisions and updates to the existing license renewal guidance documents (e.g., NUREG-1801, “Generic Aging Lessons Learned (GALL) Report,” Revision 2, and NUREG 1800, “Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants,” Revision 2, both issued in December 2010) to account for expected aging management needs for the 60 to 80-year operating period.

The guidance includes specific programs that the applicant could put in place that the NRC has previously determined to be acceptable. The public has several opportunities to participate in the subsequent license renewal process, including providing comments on environmental scoping and the draft supplemental EIS, attending public meetings, and participating in the hearing process. NRC teams visit each site to conduct audits of the environmental and safety documentation supporting the application, to interview applicant representatives, and to conduct plant and site walk-downs. Regional inspectors later visit the sites to inspect and verify the documentation, implementation, and effectiveness of the programs and activities associated with an applicant's license renewal program. Under a renewed operating license, the licensee is responsible for all existing NRC requirements as well as additional requirements related to aging management.

### **Transformational Activities and Continuous Improvements to SLR Review Process**

The NRC continues to improve its license renewal process. Based on the experience gained from the review of first three SLR applications, the staff has concluded that:

- SLR reviews can be completed in 18 months.
- Pre-submittal meetings improve coordination between the staff and the applicant.
- Use of technology— such as portals and electronic reading rooms—helped with the effectiveness of audits.
- More effective use of audits reduced the need for requests for additional information.
- The need for on-site audits can be minimized.

It may be possible to reduce the number of ACRS briefings during SLR reviews from two to one. The license renewal staff, in partnership with NRR's EMBARK Venture Studio, started an initiative to streamline and determine how we could best risk-inform the license renewal process. As part of this initiative, the staff held two public meetings on April 7, 2020 and May 27, 2020, to identify areas in which efficiencies could be introduced that would reduce the amount of required staff and applicant resources, while maintaining or increasing the effectiveness of the staff's review. The areas identified in this process included: (1) increasing the use of more focused discussions during pre-application submittal meetings to identify areas that will require additional staff resources during the review; (2) conducting the acceptance review with an integrated team of approximately eight reviewers representing the various engineering disciplines who have an awareness of the specific information that is required for a high-quality application, and (3) minimizing the operating experience portion of the on-site audit. Previously these activities were performed by approximately fifty reviewers and required extensive applicant IT support and security measures for the Corrective Action Program database access. The staff is implementing these efficiencies in the North Anna SLR review.

### **Turkey Point Subsequent License Renewal**

The staff accepted the Turkey Point SLR application from Florida Power and Light on April 26, 2018. After completing the environmental and safety reviews, on December 4, 2019, the staff issued the subsequent renewed licenses for Turkey Point Units 3 and 4, authorizing them to operate until July 19, 2052 and April 10, 2053, respectively. This was the first time the NRC issued renewed licenses authorizing reactor operation from 60 to 80 years.

During the review, the NRC received three requests for hearing. Of note, the Atomic Safety and Licensing Board (ASLB) denied one request and granted the remaining requests, admitted four contentions (as revised) for litigation, and referred one portion of its ruling to the Commission; the Commission subsequently affirmed the ASLB's referred ruling (a decision that the petitioners challenged in court and is unlikely to be decided until 2021 at the earliest). On July 8, 2019, following the staff's issuance of the draft supplemental EIS (SEIS), the ASLB dismissed the admitted contentions as moot. On June 24, 2019, the intervenors submitted two amended and four new contentions, along with a petition for waiver of certain environmental regulations. The ASLB held oral arguments on the new and amended contentions on September 9, 2019 and on October 24, 2019, the ASLB denied the intervenor's requests and terminated the legal proceeding before the ASLB. Appeals from the three ASLB decisions are pending before the Commission.

### **Peach Bottom Subsequent License Renewal**

The staff docketed the Peach Bottom Units 2 and 3 SLR application from Exelon Generating Co. (Exelon) on August 27, 2018. After completing the environmental and safety reviews, the staff issued the subsequent renewed licenses for Peach Bottom Units 2 and 3, on March 5, 2020, authorizing the units to operate until August 8, 2053, and July 2, 2052, respectively.

On November 19, 2018, Beyond Nuclear submitted a hearing request with one safety and one environmental contention. After the ASLB held oral argument on the petition, Beyond Nuclear sought permission to amend the basis statements for its contentions due to the issuance of Pacific Northwest National Laboratory Report on harvesting materials from decommissioning reactors. On June 20, 2019, the ASLB (in LBP-19-5) found that, although Beyond Nuclear had demonstrated standing to intervene, neither of its two proposed contentions was admissible. Therefore, the ASLB denied Beyond Nuclear's petition to intervene and request for hearing and

terminated the proceeding. On July 15, 2019, Beyond Nuclear appealed the Board's decision to the Commission; Exelon and the NRC staff filed answers on August 9, 2019. On August 19, 2019, Beyond Nuclear filed a reply to the NRC staff and Exelon answers, along with a motion for leave to reply. On September 3, 2019, Beyond Nuclear filed a new contention based on information contained in the draft supplemental environmental impact statement (SEIS). On October 3, 2019, the staff and Exelon filed responses, recommending denial of the new contention. These contentions are still pending before the Commission.

### **Surry Subsequent License Renewal**

On October 15, 2018, Dominion Energy submitted its SLR application for Surry Power Station, Units 1 and 2. The staff accepted the Surry Units 1 and 2 SLR application on December 3, 2018. The NRC did not receive any requests for hearing or petitions to intervene on the Surry application.

The staff issued the Safety Evaluation Report on December 27, 2019, and supported a meeting with the ACRS Subcommittee on Plant License Renewal on February 5, 2020, and an ACRS full committee meeting on April 8, 2020.

One outstanding issue concerns Dominion's obligations under the federal Coastal Zone Management Act (CZMA). Under the CZMA, the applicant must demonstrate that the proposed license renewal is consistent with and complies with enforceable policies of the Virginia Coastal Zone Management Program before NRC can issue a renewed license. The staff issued a request for additional information (RAI) on this issue on April 11, 2019, and noted the issue in the October 17, 2019 draft SEIS. On February 5, 2020, the staff issued another RAI requesting information about actions taken by the applicant to fulfill its CZMA obligations. On July 17, 2020, Dominion informed the staff that it needs an additional 90 days before it can resolve the CZMA compliance issue with the State of Virginia. The staff has completed its technical and environmental reviews and is awaiting the applicant's resolution of this issue.

## **Continuous Improvement of Reactor Oversight Process (ROP) (NRR)**

The Reactor Oversight Process (ROP) is the NRC's program to inspect, measure, and assess the safety and security performance of operating commercial nuclear power plants, and to respond to any decline in their performance. The ROP is an effective, mature program that continues to evolve and improve in order to ensure it continues to meet its original program goals of being risk-informed, performance-based, objective, predictable, and understandable. The staff, working external stakeholders, is continuously seeking and receiving feedback about the program.

In November 2018, the staff provided SECY-18-0113, "Recommendations for Modifying the Reactor Oversight Process Engineering Inspections" (ADAMS Accession No. [ML18144A567](#)) to the Commission, which included the staff's recommendations to improve the effectiveness and efficiency of ROP engineering inspections. The staff is awaiting a Commission decision on the recommendations. In October 2018, the staff initiated the ROP Enhancement project as part of the agency's overall transformation initiative. The staff received feedback from internal and external stakeholders on ways to enhance the ROP. The following areas were reviewed: assessment, inspection, significance determination process, performance indicators, emergency preparedness, radiation protection, security, and independent spent fuel storage installation. In June 2019, the results and recommendations from the staff's review were provided to the Commission in SECY-19-0067, "Recommendations for Enhancing the Reactor Oversight Process" (ADAMS Accession No. [ML19070A036](#)). The staff is awaiting the Commission's decision on the recommendations.

The staff is also currently working on the following activities to further enhance the ROP and improve its overall effectiveness and efficiency: (1) comprehensively reviewing the Problem Identification and Resolution inspection program, (2) reviewing the effectiveness of the cross-cutting issues program, (3) developing a significance determination process "tool kit" for inspectors, (4) conducting an emergency preparedness focused self-assessment, and (5) comprehensively reviewing the independent spent fuel storage installation inspection program. Any recommendations coming out of these activities will be evaluated in accordance with Management Directive 8.13 to determine the level of Commission engagement needed (notification, approval, etc.).

In January 2020, the staff promulgated the Very Low Safety Significance Issue Resolution Process (VLSSIR) process. The Commission was notified of this action in a Commissioner's Assistant Note dated December 6, 2019 (ADAMS Accession No. ML ML19323E172). The VLSSIR process was developed, based on suggestions from both internal and external stakeholders, to improve NRC processes so that very low safety significance licensing basis issues are promptly resolved without an excessive use of resources. The process revised Inspection Manual Chapter (IMC) 0612, Appendix B, "Issue Screening," and IMC 0611, "Power Reactor Inspection Reports." These IMC revisions allow inspectors to close very low safety significance issues early in the inspection process if there is a question as to whether an issue is within the licensing basis and that issue cannot be resolved without a significant level of effort. IMC 0612, Appendix B gives guidance on when the VLSSIR process can be used and IMC 0611 gives guidance on what needs to be documented in an inspection report when a very low safety significance issue is closed. Since its inception, the VLSSIR process has resulted in the closure of 5 issues in 6 months. This number of closures is within expectations for the new process.

## **Agency Efforts to Risk Inform the Regulatory Framework for Operating Reactors (NRR)**

### **Introduction**

The 1975 Reactor Safety Study<sup>1</sup> (WASH-1400), which used probabilistic risk assessment (PRA) technology, revealed PRA's unique capabilities to provide insights on safety of nuclear power plants. For example, WASH-1400 highlighted that risks to public safety from operating reactors could be dominated by small loss-of-coolant accidents (LOCAs) as opposed to the large LOCAs that were traditionally used as a basis to design plants. These insights, and the reactor accident that resulted from a small LOCA at the Three Mile Island Unit 2 (TMI) plant, prompted NRC to aggressively embark on its nearly five-decade journey to leverage risk insights to become a more effective regulator. Examples of key current NRC initiatives to continue to improve the use of risk insights in regulatory applications are provided below.

### **Foundational Commission Communications**

Of the numerous Commission communications issued during the last four decades on PRA, the foundational policies are the Commission policy statements on Safety Goals,<sup>2</sup> which followed the 1978 TMI accident, and the PRA Policy Statement.<sup>3</sup> The Safety Goal Policy Statement established qualitative and quantitative health objectives that defined an acceptable level of radiological risk. The PRA Policy Statement formalized the NRC's commitment to increasing the use of PRA technology to the extent supported by the state of the art in PRA methods and data, and in a manner that complements the NRC's deterministic approach and supports its traditional defense in depth philosophy. The Commission later defined relevant terminology and reaffirmed its expectations in a white paper on a risk-informed, performance-based approach to regulatory decision-making.<sup>4</sup> In 2019, the Commission re-affirmed its direction to the staff on the use of PRA in regulatory decision-making in a staff requirements memorandum associated with the staff's review of the NuScale application.<sup>5</sup>

### **Key Generic Letter and Regulations**

The issuance of Generic Letter 88-20<sup>6</sup> and supplements (1988-2004) created an environment that encouraged licensees to identify and eliminate risk outliers. Two regulations ("SBO Rule"<sup>7</sup> and "ATWS Rule"<sup>8</sup>) mandated safety improvements based on risk insights. Two other

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<sup>1</sup> WASH-1400 (NUREG-75/014), "Reactor Safety Study—An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants," Appendices III–IX, dated October 1975 (ADAMS Accession Nos. ML070610293, ML070610293, ML070600389, and ML070600376).

<sup>2</sup> Volume 51 of the *Federal Register* (FR), page 30028 (51 FR 30028), "Safety Goals for the Operation of Nuclear Power Plants; Policy Statement," dated August 21, 1986 (republished) (ADAMS Accession No. ML051580401).

<sup>3</sup> 60 FR 42622, "Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities; Final Policy Statement," dated August 16, 1995.

<sup>4</sup> SRM-SECY-99-0198, "Staff Requirements - Secy-98-144 - White Paper on Risk-Informed and Performance-Based Regulation," dated March 1, 1999 (ADAMS Accession No. ML003753601)

<sup>5</sup> SECY-19-0036, "Application of the Single Failure Criterion to NuScale Power LLC's Inadvertent Actuation Block Valves," dated April 1, 2019 (ADAMS Accession No. ML19060A081)

<sup>6</sup> Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities - 10 CFR 50.54(f)," issued November 23, 1988.

<sup>7</sup> 10 CFR Part 50.63, "Loss of all alternating current power."

<sup>8</sup> 10 CFR Part 50.62, "Requirements for reduction of risk from anticipated transients without scram (ATWS) events for light-water-cooled nuclear power plants."

regulations (10 CFR 50.69<sup>9</sup> and 10 CFR 50.48(c)<sup>10</sup>) provided voluntary risk-informed alternatives to enable licensees to comply with regulations using alternative means while enhancing safety. In recognition of the safety insights that PRA technology can provide, in 2007 the Commission promulgated regulations citing 10 CFR Part 52 requiring applicants for Design Certifications and Combined Licenses (COL) to prepare PRAs at various stages of plant design, initial fuel load, quadrennial upgrades, and license renewal.<sup>11</sup>

## **Revolutionary Change to Reactor Oversight Process (ROP)**

Perhaps one of the most significant changes implemented by NRC was an overhaul of its oversight process for nuclear power plants. The Reactor Oversight Process leverages risk insights to ensure effective and efficient oversight of power reactor licensees in an open and transparent manner. The regulated community and NRC consider this action a significant accomplishment. Its implementation prompted a significant change in how NRC provides regulatory oversight through inspection and enforcement and how both NRC and industry use resources to address compliance issues. SECY 99-007A provides details of the program.<sup>12</sup>

## **PRA Implementation Plans**

During the last several decades, the NRC developed and executed several plans to better risk-inform its activities. These include the agencywide PRA Implementation Plan<sup>13</sup> (1994), Risk-Informed Regulation Implementation Plan<sup>14</sup> (2000), Risk-Informed and Performance-Based Plan (2006), and the Office of Nuclear Reactor Regulation's (NRR) Risk-Informed Decision Making (RIDM) Action Plan<sup>15</sup> (2017). The latest of these, the RIDM Action Plan (1) formalized an integrated review team (IRT) approach that increases collaboration between risk analysts and traditional engineering technical reviewers; (2) provided plans for a systematic, graded approach for expanding the use of risk insights within the existing regulatory framework; (3) created training modules used during the rollout of improved guidance documents and procedures; and (4) laid the groundwork for continued advancement of NRC and industry risk-informed initiatives and for enhanced communication and awareness of RIDM activities.

## **Examples of Ongoing and Recently Completed Risk-Informed Initiatives**

Be riskSMART Initiative<sup>16</sup>: The agencywide Be riskSMART risk-informed decisionmaking framework supports the advancement of consistent policies and guidance that give staff confidence in accepting well-managed risks in decisionmaking without compromising the NRC's mission. The framework is applicable across the technical, legal, and corporate areas and considers, complements, and enhances the use of existing risk-informed guidance documents and activities such as those described here for the Operator Reactor Program (e.g., risk-

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<sup>9</sup> 10 CFR Part 50.69, "Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors."

<sup>10</sup> 10 CFR Part 50.48(c), "National Fire Protection Association Standard NFPA 805."

<sup>11</sup> 10 CFR 50.71(h), "Maintenance of records, making of reports."

<sup>12</sup> SECY 99-007A, "Recommendations for Reactor Oversight Process Improvements," March 22, 1999.

<sup>13</sup> <https://www.nrc.gov/about-nrc/regulatory/risk-informed/history/1994-1999.html>

<sup>14</sup> <https://www.nrc.gov/about-nrc/regulatory/risk-informed/history/2000-2007.html>

<sup>15</sup> "Action Plan Risk-Informed Decision-Making," dated January 23, 2018. (ADAMS Accession No. ML18005A911)

<sup>16</sup> <https://usnrc.sharepoint.com/teams/Be-riskSMART>

informed licensing basis changes, LIC-206, “Integrated Risk-Informed Decision-Making for Licensing Reviews.<sup>17</sup>”).

Enabling Licensees to Risk-Inform Licensing Bases: Since FY2018, the NRC has approved over 100 license amendment requests (LARs) to implement risk-informed initiatives (e.g., 10 CFR 50.69, TSTF-505<sup>18</sup>, TSTF-425<sup>19</sup>). Review of these LARs continues to be a high priority for the staff. Licensees that receive approvals have the flexibility to change critical operating elements through modified treatment of low risk systems, flexible surveillance intervals, and flexible allowable outage times for technical specification equipment, using change processes approved by the NRC and PRA models whose quality is acceptable to NRC.

FLEX Strategies<sup>20</sup>: Owners of US nuclear power plants spent about four billion dollars to make safety improvements in response to the nuclear accident at Fukushima Dai-ichi Nuclear Power Plant in 2011. These include development of flexible and diverse coping strategies for dealing with beyond-design-basis external events (referred to as “FLEX”). In addition, NRC has worked with industry to share mutual operating experience with FLEX, improve equipment reliability estimates, and provide an NRC developed human reliability assessment method and tool for risk-modeling of plant operators use of the FLEX equipment and strategies. These efforts enable more realistic risk assessment and better management of power plant risk. In addition, NRC continues to support voluntary safety improvements through the expanded use of FLEX beyond its initial purpose to further reduce plant risk. In addition to enhancing safety, the expanded use of FLEX can also provide licensees with additional plant operational flexibility. In September 2020, the NRC and industry held a five-day virtual FLEX summit on the above topics to exchange information and to transfer knowledge to industry and NRC staff newly involved in FLEX activities. Nearly 200 individuals participated in the summit.

LIC-206, “Integrated Risk-Informed Decision-Making for Licensing Reviews”: This Office of Nuclear Reactor Regulation (NRR) Office Instruction is a key product generated as a result of the RIDM Action Plan. It enables NRC staff to better incorporate consideration of risk insights into licensing reviews through the establishment of integrated review teams, where risk analysts work together with traditional deterministic reviewers to complete these reviews.

Very Low Safety Significance Issue Resolution (VLSSIR)<sup>21</sup>: The Very Low Safety Significance Issue Resolution effort began as a task under the ROP enhancement project. Stakeholder feedback suggested that NRC should establish a process for resolving very low safety significant issues in cases where there is ambiguity as to whether the issues resides within the licensing basis. This initiative resulted in revisions to Inspection Manual Chapter (IMC) 0612<sup>22</sup>, Appendix B, “Issue Screening,” and IMC 0611<sup>23</sup>, “Power Reactor Inspection Reports,” to minimize inspection efforts associated with very low safety significant issues in cases where it is unclear if the issue represents a non-compliance or not.

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<sup>17</sup> LIC-206, “Integrated Risk-Informed Decision-Making for Licensing Reviews” Revision 1, June 26, 2020 (ADAMS Accession No. ML19263A645).

<sup>18</sup> TSTF-505, “ Final Revised Model Safety Evaluation of Traveler TSTF-505, Revision 2, “Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b,” November 21, 2018 (ADAMS Accession No. ML18253A085).

<sup>19</sup> TSTF-425, Revision 3, “Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5b,” March 27, 2009 (ADAMS Accession No. ML090850642).

<sup>20</sup> <https://usnrc.sharepoint.com/teams/NRR-Crediting-MS-in-RIDM/SitePages/Home.aspx>

<sup>21</sup> <https://nuclepedia.usalearning.gov/index.php?title=LSSIR>

<sup>22</sup> IMC 0612 App B Additional Issue Screening Guidelines (ADAMS Accession No. ML19247C384).

<sup>23</sup> IMC 0611 Power Reactors Inspection Reports (ADAMS Accession No. ML19317F647).

Risk Informed Process for Evaluations (RIPE)<sup>24</sup>: This process can be used to resolve very low safety significant compliance issues using existing regulations under 10 CFR 50.12 and 50.90, which address exemptions and license amendments, respectively. The objective of this initiative, which is an extension of VLSSIR, is to focus NRC and licensee resources on the most safety significant issues by addressing very low risk compliance issues in an efficient and predictable manner, consistent with our Principles of Good Regulation. The process, which is under development, will leverage existing regulations and risk insights to disposition these issues and create an incentive for licensees to further develop and use probabilistic risk assessment tools and applications.

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<sup>24</sup> [https://usnrc.sharepoint.com/teams/RIPE\\_EMBARK](https://usnrc.sharepoint.com/teams/RIPE_EMBARK)

## **A Review of the Trend in Reactor Oversight Process (ROP) Inspection Findings (NRR)**

At the 2020 Agency Action Review meeting, staff noted that the decreasing trend in NRC inspection findings continued in 2019, constituting a 49% decrease from 2015 to 2019. In Staff Requirements Memorandum SRM-M190620, the Commission directed the staff to perform an analysis to better understand the likely causes of the decline in the number of inspection findings and to consider whether further action is appropriate. In July 2019, the staff issued a Commissioners' Assistants (CA) Note (ADAMS Accession No. ML19191A256), in which the staff attributed the decline to three likely drivers:

- Efforts made to improve regional consistency when documenting inspection findings.
- Increased engagement by industry during the findings process.
- Increased focus on application of the backfit rule.

Extending the review to account for 2019 findings found that the declining trend continued at roughly the same rate, having declined from about 12.4 findings per site in 2015 to 7.4 findings per site in 2018 and 6.2 findings per site in 2019 (this measurement is not affected by the change in the number of operating sites). The staff is tracking the findings trend in 2020 and continues to analyze several factors that may be causing this trend, but there is no definitive evidence of a single causal factor.

The NRC's efforts to improve regional consistency and emphasize the use of risk-insights continue and include: (1) additional inspector training on backfit issues, (2) establishing regional and cross-regional panels to review findings and decision-making for ROP results, (3) increased management oversight of inspectors when identifying and screening findings and performance deficiencies, (4) updates to Inspection Manual 0612 Appendix B and Appendix E, and (5) development of a process to efficiently resolve very low safety significant issues.

The staff notes that licensees have made improvements in several areas relevant to plant safety since 2000; however, the staff has not identified an appreciable performance improvement factor implemented since 2015 that would account for the magnitude of the reduction in findings over that period.

The data analyzed by the staff in its CA Note indicates that the reduction in findings from 2015 to 2019 was attributed primarily to staff efforts to improve consistent implementation of the ROP. Inspectors are still raising issues of concern to licensees, and licensees are required to correct any non-compliances identified by inspectors.

The staff continues to monitor the decrease to ensure the ROP remains a robust and comprehensive program.

### **Baffle-Former Bolts (or Baffle Bolts) (NRR)**

Baffle-former bolts, components of the reactor vessel internals, are made of stainless-steel alloys and measure about 2 inches in length and 5/8ths of an inch in diameter. The bolts attach a series of vertical metal plates (known as baffle plates) within the reactor vessel to horizontal former plates that provide structural support. The vertical baffle plates surround the reactor core and help direct water up through the nuclear fuel assemblies, where the water is heated and subsequently used for power production.

Baffle-former bolts are subject to degradation over time due to irradiation-assisted stress corrosion cracking (IASCC) and fatigue. This degradation can reduce the load-bearing capability of the baffle-former bolt and break or separate the bolt head from the bolt shaft. The agency was aware of the potential for baffle-former bolts to degrade, and the issue was addressed in generic communications in the 1990s and later by including the bolt inspections in aging management programs for plants with a renewed operating license. Inspections in 2016 of baffle-former bolts at Indian Point Unit 3 identified larger numbers of degraded bolts than were anticipated; subsequent inspections at Salem Unit 1 and D.C. Cook Unit 2 produced similar results. The potential for greater-than-anticipated bolt degradation appears to be limited to nine reactors with a specific set of similar characteristics: Indian Point Units 2 and 3, Salem Units 1 and 2, D.C. Cook Units 1 and 2, Diablo Canyon Unit 1, and Sequoyah Units 1 and 2.

The NRC staff completed a risk-informed evaluation of the issue (ADAMS Accession No. ML16225A341) and concluded that immediate shutdown to inspect the bolts was not necessary. This evaluation found that the nine most-susceptible reactors could safely operate until the next refueling outage and perform inspections of the baffle-former bolts at that time. The industry formed a focus group in 2016 to address the issue, including root cause evaluation, corrective actions, and enhanced inspection guidance. The Electric Power Research Institute (EPRI) issued interim guidance in 2016 recommending that the nine most-susceptible reactors perform inspections of the baffle-former bolts at the next refueling outage. These nine plants have all completed baffle-former bolt inspections, replaced potentially degraded bolts, and in some cases replaced additional non-degraded bolts to provide additional margin.

A second interim guidance letter issued in 2017 recommended accelerated initial inspections of additional reactors in the next most susceptible group of plants. This next-most-susceptible group of plants includes Prairie Island Units 1 and 2, the R.E. Ginna nuclear power plant, H.B. Robinson Unit 2, Surry Units 1 and 2, Turkey Point Units 3 and 4, and six plants outside of the U.S. Plants that identify degraded bolts are replacing those bolts with new bolts featuring an improved design and materials.

The NRC staff issued a staff assessment of the industry interim inspection guidance in 2017 (ADAMS Accession No. ML17310A861). To ensure consistency among guidance documents, the industry incorporated EPRI's 2016 and 2017 updated guidance for accelerated baffle-former bolts examinations into the updated pressurized water reactor (PWR) internals inspection and evaluation guidelines (Materials Reliability Program (MRP)-227, Revision 1). The NRC staff issued its final safety evaluation of MRP-227, Revision 1 in April 2019. The NRC-approved version of the report, MRP-227, Revision 1-A, was submitted to the NRC and made publicly available in December 2019 (ADAMS Accession No. ML19339G364).

The industry's actions related to baffle-former bolt degradation are part of an established aging management program to monitor, evaluate, and take corrective actions for aging degradation in PWR internal components. The NRC's reactor oversight process includes a risk-informed and

performance-based assessment of the effectiveness of licensee activities for management of baffle-former bolt aging degradation. Based on these activities, which include proactive measures to identify and address aging degradation, the NRC staff has reasonable assurance that baffle-former bolting degradation does not present a significant risk to public health and safety.

## **History**

Baffle-former bolts degradation was identified in French PWR operating experience during the 1980s. The NRC staff issued an Information Notice in March 1998 to inform licensees of the degradation observed in Europe. Several U.S. plants subsequently evaluated their baffle-former bolts and in some cases the licensees proactively replaced them. In 2011, the NRC staff approved MRP-227-A for the aging management of PWR reactor vessel internals, including baffle-former bolts. PWR licensees that have adopted this guidance in license renewal are required to perform ultrasonic inspections of all baffle-former bolts between 25 and 35 effective full power years.

## **Scope of Issue**

Greater-than-anticipated bolt degradation appears to be limited to Westinghouse-designed PWRs with four reactor coolant loops, baffle-former bolts made of Type 347 stainless steel, and baffles arranged in a “down-flow” configuration. (In a down-flow configuration, reactor coolant water flow between the baffle and the core barrel is in the downward direction, which results in higher differential pressure across the plates and stress in the bolts. This flow is a small fraction of the total flow through the reactor, known as bypass flow. In an up-flow configuration, the direction of bypass flow between the baffle and the core barrel is upward.) There are seven reactors with these characteristics: Indian Point Units 2 and 3, Salem Units 1 and 2, D.C. Cook Units 1 and 2, and Diablo Canyon Unit 1. (Diablo Canyon Unit 2 was previously modified to an “up-flow” configuration.) Type 347 stainless steel bolts appear to be the most susceptible to this degradation mechanism, but other types of stainless steel (including Type 316) are also impacted. Other Westinghouse down-flow design reactors (two-loop and three-loop), have some susceptibility to bolt degradation, but have not experienced unexpectedly high degradation levels. Westinghouse plants operating in an “up-flow” configuration have low susceptibility to baffle-former bolt degradation. Due to use of different bolt materials and operation in an “up-flow” configuration, Babcock & Wilcox PWRs and Combustion Engineering reactors also have low susceptibility to baffle-former bolt degradation.

## **Potential Consequence**

The failure of a few baffle-former bolts during normal operation has low safety significance. Loose parts from a failed bolt could cause damage to a fuel assembly, but even if the condition is extensive it should be detected by routine monitoring of radioactivity in the reactor coolant system water. The failure of a large number of bolts in a concentrated region could potentially allow a baffle plate to detach and result in localized fuel damage following a loss of coolant accident (LOCA) or seismic event. However, the NRC staff concluded that baffle-former bolt degradation was not a significant contribution to core damage frequency for a potential LOCA. The NRC staff’s analysis of a seismic event found that in the most susceptible group of reactors (nine Westinghouse four-loop plants with a down flow design), approximately 75% of the baffle-former bolts (624 out of 832 bolts, total) would need to fail to result in a significant increase to the core damage frequency for a seismic event.

## **Operating Experience**

### Inspections at Reactors in Susceptible Group

In 2016 and 2017, baffle-former bolt inspections conducted at some susceptible plants (Indian Point Units 2 and 3, Salem Unit 1, and DC Cook Unit 2) indicated significant numbers of degraded bolts, which were subsequently replaced. Follow-up inspections in 2018 and 2019 at Indian Point Units 2 and 3 and DC Cook Unit 2 found smaller numbers of degraded original bolts and no degraded replacement bolts. Follow-up inspections at Salem Unit 1 in 2019 identified clustered degradation of a significant number of baffle-former-bolts. The licensee replaced 272 bolts and has proposed additional follow-up activities for their Fall 2020 outage.

Inspections conducted in 2017 at the remaining three reactors in the most susceptible group (Diablo Canyon Unit 1, D.C. Cook Unit 1, and Salem Unit 2) found smaller numbers of degraded bolts. The licensees for these reactors replaced all the degraded bolts and preventively replaced additional non-degraded original bolts.

### Inspections at Other Downflow Plants

Sequoyah Units 1 and 2 are Westinghouse four-loop reactors operating in “down-flow.” Sequoyah Units 1 and 2 are equipped with Type 316 stainless steel baffle-former bolts, as opposed to Type 347 stainless steel baffle former bolts. This distinction makes Sequoyah Units 1 and 2 slightly less susceptible than the other seven reactors in the most susceptible group. Both Sequoyah reactors have now completed ultrasonic examinations of the baffle-former bolts, finding a minimal number of degraded bolts. In addition, the updated EPRI guidance directed Westinghouse two-loop and three-loop reactors operating in a downflow configuration to complete the initial ultrasonic inspection of the baffle-former bolts on an accelerated schedule. These inspections have been completed at most of the reactors. These plants have found lower levels of degraded bolts, ranging from zero to ten percent bolts being potentially degraded. These plants generally performed an analysis to show that they could safely operate with the few degraded bolts.

### Inspections at Up-flow Plants

Several plants that were modified to convert from “down-flow” to “up-flow” have performed ultrasonic inspections, finding low levels of degraded bolts. These include Westinghouse two-loop reactors Point Beach, Units 1 and 2; and a Westinghouse three-loop reactor, North Anna, Unit 1. Diablo Canyon Unit 2, a Westinghouse four-loop PWR, was previously converted to the “up-flow” configuration and has Type 316 stainless steel bolting. A 100 percent visual inspection of the Diablo Canyon Unit 2 baffle-former bolts was performed in May 2016, and no indications of degradation were identified.

### **Accident Tolerant Fuel (ATF) (NRR)**

The U.S. nuclear industry, with the assistance of the U.S. Department of Energy (DOE), is seeking to develop and deploy new fuel technologies for nuclear reactors that are expected to perform better than currently licensed fuels during normal operation and under transient and accident conditions. Near-term accident tolerant fuel (ATF) designs, which the industry is pursuing for deployment by the mid-2020s, will have relatively small departures from today's nuclear fuel designs. These departures include additives to standard fuel pellets intended to improve various properties and coatings applied to the outside of standard claddings intended to reduce corrosion, increase wear resistance, and reduce the production of hydrogen under accident conditions. Additionally, at least one fuel vendor is pursuing a steel cladding with improved corrosion and hydrogen production characteristics.

In the longer term, the nuclear industry is developing ATF concepts that include new higher-density fuel pellet materials that could allow additional uranium loading without increasing enrichment, and silicon carbide fuel cladding, which may offer significantly improved performance under accident conditions. The industry is also pursuing extruded metallic fuel, which may offer lower operating temperatures and other improvements.

In addition to the near-term and longer-term technologies, industry is also pursuing increased enrichment and higher burnup nuclear fuel. For increased enrichment, NRC staff expects to receive vendor applications for fuel enrichment up to 10 weight percent U-235, rather than the current 5 weight percent, above which additional restrictions, plant systems, or analyses may apply. Staff is currently considering the potential impact of increased enrichment on licensees under the present regulatory scheme. Regarding burnup, the industry is pursuing up to 75 or 80 gigawatt-days per metric ton of uranium (GWd/MTU), which is above the current limits. Current limits are fuel-design dependent and around 62 GWd/MTU across the fleet. The industry has stated that the economic benefits of increased enrichment and higher burnup will be used to offset the increased costs of the ATF technologies. The NRC staff has approved one license amendment for a fuel enrichment facility to enrich to 5.5 weight percent (ADAMS Accession No. ML20119A040). Additionally, NRC staff has approved an ATF-related request to allow the transportation of fuel assemblies with chromium-coated cladding and fuel rods enriched to up to 7 percent (ADAMS Accession No. ML20255A295). Staff is also reviewing an amendment application from American Centrifuge Operating LLC (a subsidiary of Centrus Energy Corporation) to allow enrichment up to 19.75% to produce High Assay Low Enriched Uranium (HALEU).

To varying degrees, each ATF design is expected to offer power plant owners more flexibility in how they operate their plants and to provide more robust performance during normal operation and accident conditions. The ATF designs may enhance the ability to mitigate accidents by providing additional time to plant operators before the onset of potential fuel-damaging conditions. Higher fuel burnup may also reduce the amount of high-level waste produced by operating reactors.

To increase regulatory stability and certainty, along with enhancing and optimizing NRC review, the staff has developed a "Project Plan to Prepare the U.S. Nuclear Regulatory Commission for Efficient and Effective Licensing of Accident Tolerant Fuels," with Version 1.1 dated October 2019 (ADAMS Accession No. ML19301B166). The plan addresses the complete fuel cycle, including fuel enrichment, fabrication, uranium hexafluoride and fresh fuel transport, in-reactor requirements, and spent fuel storage and transportation.

The project plan outlines a new approach to fuel licensing, in which the NRC seeks engagement with ATF applicants much earlier in the research and development phase than has occurred historically. Data sharing and engagement during this phase will facilitate efficiency during the licensing review. This early engagement is designed to identify and address potential safety issues as soon as possible to allow the overall safety findings to be reached within the planned licensing timeline. The staff has also augmented the project plan with an appendix to support higher burnup and the companion increase in fuel enrichment.

The project plan also states that the NRC will refine its regulatory infrastructure in parallel with the industry's research and development efforts. During this process, the staff will maintain significant communication with NRC stakeholders to ensure transparency and to clearly communicate regulatory expectations to the applicant early in the process. One example of this communication is an August 2019 letter to the industry identifying the enrichment and fuel fabrication critical path schedule necessary to support industry's desired ATF batch loading date (ADAMS Accession No. ML19235A261). The staff believes that adherence to this strategy will benefit all the agency's stakeholders through the planned deployment of ATF designs.

The staff has implemented this strategy for coated cladding concepts by issuing interim staff guidance (ISG) titled "Supplemental Guidance Regarding the Chromium-Coated Zirconium Alloy Fuel Cladding Accident Tolerant Fuel Concept" (ADAMS Accession No. ML19343A121), dated January 2020, which provides staff and industry guidance on important focus areas for coated cladding licensing. This document incorporated input from a phenomena identification and ranking table (PIRT) panel of experts on coated cladding and has been informed by comments from stakeholders at multiple stages.

The NRC is monitoring the DOE's efforts to advance the technical basis for ATF. The NRC has added ATF-specific addenda to the NRC's memorandum of understanding (ADAMS Accession No. ML17130A815) with DOE, which allows the NRC to engage with DOE on planned testing of ATF designs and to develop and validate the appropriate data required to model ATF. Early access to these experimental data and analyses will allow the NRC to be better prepared for licensing ATF concepts when they are submitted for review.

The NRC and DOE are also working on ways to leverage current computational capabilities to reach safety findings for ATF designs. NRC computational tools can be used to evaluate near term ATF concepts. The NRC is evaluating whether DOE's unique and advanced modeling capabilities can be used by the staff to assess longer term concepts.

Finally, both the NRC and DOE are working with a new, international reactor fuels and materials testing framework under the auspices of the Nuclear Energy Agency (NEA), known as the Framework for Irradiation Experiments (FIDES). The FIDES framework is intended to provide similar access to experimental reactor safety data that became unavailable when the Norwegian Institute for Energy Technology permanently shut down the Halden reactor.

## **Digital Instrumentation and Controls (I&C) (NRR)**

The U.S. nuclear industry is replacing obsolescent analog controls with new digital technologies to improve plant reliability and efficiency. The NRC's goal is to enable the expanded safe use of digital instrumentation and controls (I&C) in commercial nuclear reactors by ensuring a clear regulatory structure and reducing regulatory uncertainty. In 2016, the Commission directed the staff to develop an integrated strategy to modernize the NRC's digital I&C regulatory infrastructure (SRM-SECY-15-0106, ADAMS Accession No. ML16056A614). The Commission directed the staff to engage in public workshops and meetings with relevant standards-setting committees, digital I&C vendors, licensees, and other external stakeholders to reach a common understanding of the digital I&C regulatory challenges and priorities.

In coordination with operating reactor, advanced-reactor, and vendor stakeholders, the staff identified key topics to modernize the NRC's digital I&C regulatory infrastructure: digital I&C upgrades and replacements without NRC review under 10 CFR 50.59, "Changes, tests, and experiments"; licensing process improvements; protection against common-cause failure (CCF); and acceptance of commercial-grade digital equipment for safety related applications. In May 2016 (ADAMS Accession No. ML16126A137), the staff submitted for Commission approval an integrated action plan (IAP), to address these key topics.

The Commission approved the staff's planned approach in October 2016 (ADAMS Accession No. ML16299A157). The NRC staff subsequently updated the IAP in March 2017, January 2018, and January 2019 (ADAMS Accession Nos. ML17102B307, ML18016B023 and ML19025A312, respectively). The staff and external stakeholders briefed the Commission during public meetings on October 25, 2018, and May 14, 2019. The staff has completed significant updates to the digital I&C regulatory infrastructure, which have improved the confidence of licensees and applicants in using new digital I&C technologies in commercial nuclear reactors. The staff provided SECY-19-0112 (ADAMS Accession No. ML19261B629) to the Commission on remaining infrastructure improvements and will continue to provide annual updates to the Commission.

Licensees complete most digital upgrades under the 10 CFR 50.59 change process, which authorizes licensees to make some changes without prior NRC approval. In May 2018, the staff issued Regulatory Information Summary (RIS)-2002-22, Supplement 1, "Clarification on Endorsement of NEI Guidance in Designing Digital Upgrades in Instrumentation and Control Systems," (ADAMS Accession No. ML18143B633). Supplement 1 provides guidance on qualitative assessments that can be used in the 10 CFR 50.59 process to evaluate the likelihood of failure of a proposed digital modification. In public meetings, industry representatives have stated that the staff's supplement to RIS-2002-22 has been vital in addressing real-time equipment obsolescence challenges, and improving the performance of diesel generator controls, turbine and feedwater controls, and digital inverters. In addition, in June 2020, the staff endorsed comprehensive industry guidance in NEI-96-07, Appendix D, "Supplemental Guidance for Application of 10 CFR 50.59 to Digital Modifications," as Revision 2 to RG 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments."

In December 2018 the NRC staff issued a revision to Interim Staff Guidance (ISG) DI&C-ISG-06, "Licensing Process," to improve review efficiency, clarity, and predictability for major digital modifications that require a license amendment. The revision included a new alternate review process for some major digital upgrades to reactor protection systems and emergency core

cooling systems. The staff expects this alternate review process to allow the NRC to make decisions earlier in the applicant's digital design process, rather than under the standard licensing review process. The staff is piloting the new alternate review process with a modest digital I&C license amendment request received in July 2020, to replace the Waterford 3 core protection calculator. The staff expects a license amendment request for a significant digital upgrade to Limerick safety systems in 2021.

Digital I&C technologies provide increased reliability and safety benefits but can also introduce new types of potential common cause failures (CCF). For example, software design errors, programming errors, or hardware design errors could result in failure of multiple safety systems with identical digital I&C systems. Staff is applying a safety significance-based approach to ensure the level of regulatory review is commensurate with safety significance in a manner consistent with the guiding principles for addressing CCF in digital I&C systems outlined in SECY-18-0090<sup>1</sup>.

To address CCF in licensing, the staff is updating Branch Technical Position (BTP) 7-19, "Guidance for Evaluation of Diversity and Defense-In-Depth in Digital Computer Based Instrumentation and Control Systems," which provides guidance to the NRC staff for evaluating a licensee's diversity and defense-in-depth analysis against potential CCF in new digital equipment. The update will provide a comprehensive framework for reviewing potential CCF and will address key technical issues identified by industry stakeholders. The staff published a draft revision to BTP 7-19 for public comment in January 2020 and plans to issue the final revision to OMB by December 2020.

NEI plans to submit NEI 17-06, "Supplemental Guidance for Acceptance of Digital Equipment using 3rd Party Certification" for NRC endorsement to facilitate the acceptance of commercial-grade digital equipment for safety related applications. The staff will conduct a technical review of the document and then develop NRC guidance for endorsement, if acceptable.

The improvements to NRC guidance are already leading to the expanded, safe use of digital I&C. This is evidenced by the widespread use of RIS 2002-22, Supplement 1, and licensees' plans to submit license amendment requests for more complex digital I&C projects using the alternate review process in ISG-06 revision 2.

Concurrent with efforts to modernize the regulatory infrastructure, the NRC has achieved successes with a number of notable digital I&C licensing actions: a first-of-its-kind complete digital replacement of the Purdue research reactor protection and control system; the design certification for the Advanced Power Reactor 1400 (APR1400); and approval of several digital platforms for generic use by licensees. The staff also successfully used a design-specific review standard (DSRS) to evaluate the NuScale small modular reactor's highly integrated digital instrumentation and control systems.

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<sup>1</sup> SECY-18-0090, "Plan for Addressing Potential Common Cause Failure in Digital Instrumentation and Controls," dated September 12, 2018 (ADAMS Accession No. ML18179A066)

## **NextEra and Entergy Exit from the Nuclear Energy Institute (NRI)**

The Office of Nuclear Reactor Regulation (NRR) frequently interfaces with external stakeholders (e.g., owners' groups, vendors, the Nuclear Energy Institute (NEI), public interest groups) to discuss industry issues, safety or security concerns, technical changes or improvements, new regulations or guidance, issues related to regulatory oversight and to promote the understanding of reactor operations, security, or emergency preparedness.

NEI is a policy organization of the nuclear technologies industry, based in Washington, D.C. NEI's members (see [NEI public website, www.nei.org](http://www.nei.org)) include companies that own or operate nuclear power plants, reactor designers and advanced technology companies, architect and engineering firms, fuel suppliers and service companies, consulting services and manufacturing companies, companies involved in nuclear medicine and nuclear industrial applications, radionuclide and radiopharmaceutical companies, universities and research laboratories, law firms, labor unions, and international electric utilities.

In February 2018, NextEra Energy Inc. and Entergy Nuclear Operations formally separated from NEI. No other licensees have since indicated an intent to separate from NEI. The NextEra and Entergy withdrawal from NEI has not impacted any prior commitments made by their operating fleets to NEI documents or any commitments made on behalf of those facilities by NEI (see ADAMS Accession No. [ML18072A101](#) and [ML18068A087](#)).

The staff developed guidance in 2018 that provided additional details for interactions and information sharing with non-NEI licensees. The development of this guidance followed an in-depth staff evaluation of the impacts associated with the termination of membership in NEI by NextEra and Entergy, with the goal of ensuring continued regulatory effectiveness across the fleet of operating reactors.

On April 2, 2018, the Commission issued SRM-COMSECY-18-0004 (ADAMS Accession No. [ML18092A387](#)), approving the use of a Joint Composite Adversary Force (JCAF) at NextEra and Entergy reactor sites in support of NRC-conducted force-on-force (FOF) exercises, for FOF inspections in 2018 and 2019 only. In SRM-COMSECY-18-0004, the Commission also directed the staff to provide an assessment and options for a long-term alternative to the NEI-managed Composite Adversary Force (CAF). In May 2019, the staff submitted to the Commission SECY-19-0046, "Options for a Long-term Alternative to the Nuclear Energy Institute Composite Adversary Force," an assessment of options for a long-term alternative to the NEI CAF. In October 2019, the Commission approved the staff's recommended option, to use one or more industry managed Mock Adversary Forces and allow the industry to implement and manage the MAFs for use during NRC-conducted FOF exercises.

NEI submitted a letter in May 2019 requesting a fee waiver for future NRC activities associated with the NEI CAF, as well as FY 2018 fees assessed within invoice LFB-18-5202 for the CAF. In June 2019, the Chief Financial Officer (CFO) denied the fee waiver request for future CAF selection oversight but granted a one-time fee waiver for the FY 2018 fees. The NRC had not previously charged 10 CFR Part 170 fees to NEI for work related to the CAF selection process due to an error on the NRC's part; NEI was initially notified of the fee recovery changes during a May 1, 2018, teleconference with the Deputy Director, Office of Nuclear Security and Incident Response. However, the CFO acknowledged that communications on this issue resulted in unclear expectations, and that NEI was not able to properly budget the finances for invoice LFB-

18-5202. Therefore, the CFO granted a one-time fee exemption for invoice LFB-18-5202 under § 171.11(b), which states, “The Commission may, upon application by an interested person, or upon its own initiative, grant such exemptions from the requirements of this part as it determines are authorized by law and are otherwise in the public interest. All NRC resources spent on plant-specific FOF exercises are still billed directly to each utility.

In February 2020, NSIR staff conducted oversight of JCAF training activities at the St. Lucie Plant. NextEra and Entergy were directly billed for the oversight activities.

## **Seabrook Alkali-Silica Reaction (ASR) (NRR)**

Alkali-Silica Reaction (ASR) is a chemical phenomenon in concrete where, given sufficient moisture, the alkaline cement interacts with a reactive aggregate over time. ASR produces a gel that expands as it absorbs moisture and may lead to diminished structural integrity of concrete-based structures.

NextEra Energy Seabrook, LLC, the licensee for Seabrook Station, Unit 1, initially identified concrete degradation in 2009, and it confirmed that the degradation was due to ASR in 2010. Bulk expansion effects of ASR (e.g., building deformation) were identified at Seabrook in 2015. Seabrook is the only nuclear power plant in the U.S. that has identified ASR. A complete background and status of the NRC's oversight of Seabrook ASR can be found at: <https://www.nrc.gov/reactors/operating/ops-experience/concrete-degradation.html>.

On August 1, 2016, NextEra submitted a license amendment request to revise the Seabrook licensing basis to include a methodology to account for the effects of ASR on seismic category I structures. The proposed methodology was supported by a large-scale test program at the Ferguson Structural Engineering Laboratory (FSEL) at the University of Texas – Austin. NextEra also supplemented its license renewal application, originally submitted on May 25, 2010, with updated Aging Management Programs (AMPs) to address the effects of ASR beyond the 40-year operating license. The updated AMPs are based on the methodology in the ASR-related license amendment request. On September 28, 2018, the staff provided the Advisory Committee on Reactor Safeguards (ACRS) with both the safety evaluation report for license renewal and the draft safety evaluation for the ASR-related license amendment request to support Fall 2018 ACRS meetings. Following those meetings, on December 14, 2018, the ACRS issued a letter to the Chairman stating that the ACRS independently reviewed the staff's safety evaluations for both the license renewal application and the license amendment request and agreed with the staff's conclusions, noting that the staff's safety evaluations provide thorough assessments and findings. On December 19, 2018, the ACRS issued a letter to the Commission stating that the Seabrook license renewal application should be approved. On March 11, 2019, the staff issued the ASR-related license amendment. On March 12, 2019, the staff issued the renewed license for Seabrook.

On October 6, 2017, the Atomic Safety and Licensing Board (ASLB) granted a request for a hearing on the ASR-related license amendment request filed by the C-10 Research & Education Foundation, Inc. (C-10). The ASLB ruled that C-10 had demonstrated standing and had pled five admissible contentions, which the ASLB reformulated into a single contention. The admitted contention alleged that the FSEL large-scale test program data fail to adequately represent the progression of ASR at Seabrook and, therefore, the data fail to provide an adequate basis for the license amendment request's proposed monitoring, inspection criteria, and inspection intervals. From September 24-27, 2019, the ASLB held an evidentiary hearing on the admitted contention. On August 21, 2020, the ASLB issued its merits decision on the contention. In the decision, the ASLB imposed four conditions on NextEra and concluded that, with the imposition of these conditions, the license amendment request satisfied the NRC's requirements. No party appealed the decision to the Commission before the deadline; however, C-10 did ask the ASLB to reconsider its decision. Specifically, C-10 asked the ASLB to make changes to the terms of the four conditions that the ASLB had imposed. The ASLB has not yet ruled on this request.

## **Algonquin Incremental Market Natural Gas Transmission Pipeline and Indian Point (AIM&IP) (NRR)**

### **Introduction**

On February 13, 2020, the NRC's Office of the Inspector General (OIG) issued the results of an inquiry titled "Concerns Pertaining to Gas Transmission Lines at the Indian Point Nuclear Power Plant" (ML20056F095). In that report, the OIG raised concerns regarding the NRC's safety analysis that supported the FERC determination to approve a new 42-inch Algonquin Incremental Market (AIM) pipeline near Indian Point and the NRC's response to a related 10 CFR 2.206 petition.

On February 24, 2020, the NRC Chairman directed the NRC staff to determine whether any immediate regulatory action was needed. Based on a prompt review, the Executive Director for Operations (EDO) determined that there were no safety issues warranting immediate regulatory action at Indian Point (ADAMS Accession No. ML20058D088).

The staff was further directed to conduct a review within 45 days to determine whether the staff should revisit either its prior safety conclusions regarding the AIM pipeline or its response to the 10 CFR 2.206 petition, as well as to evaluate whether any modifications to agency practice or procedures were needed based on the OIG report. On February 27, 2020, the EDO established an Expert Evaluation Team to carry out the review directed by the NRC Chairman. On April 8, 2020, this team issued "Report of the U.S. Nuclear Regulatory Commission Expert Evaluation Team on Concerns Pertaining to Gas Transmission Lines Near Indian Point Nuclear Power Plant" (ADAMS Accession No. ML20100F635).

The team concluded that Indian Point remains safe. The safety conclusion was based on the low likelihood of a rupture of the AIM pipeline and the protection that both distance and rugged construction provide to safety-related equipment at Indian Point. The team also corroborated several of the findings in the OIG report and made six recommendations to address those findings. The Executive Director for Operations accepted all of the recommendations and directed the staff to implement them. Task groups are currently implementing actions in response to each of the Expert Evaluation Team's recommended improvements. These actions were assigned to Region I, NRR, RES, and NMSS, with support from other parts of the agency.

1. Action 1 (Region I): Ask Entergy to revisit the assumptions it made regarding the consequences of a postulated rupture of the 42-in pipeline. (see Section 2.6 of the expert evaluation team report)
2. Action 2 (NRR): Conduct effective initial and continuing training on peer review procedures. (Section 4.1 of the report)
3. Action 3 (NRR): Develop guidelines / good practices for arranging technical support from headquarters for inspections. (Section 4.2 of the report)
4. Action 4 (NRR): Improve the 10 CFR 2.206 petition review process with designated members, independent perspectives, updated acceptance criteria and documented analysis. (Section 4.3 of the report)
5. Action 5 (RES): Update Regulatory Guide 1.91 to address identified technical issues and clarify analysis expectations. (Section 4.4 of the report)
6. Action 6 (NMSS): Create or revise guidance for interagency coordination to provide for better documentation and criteria for different levels of participation. (Section 4.5 of the report)

The teams assigned to implement these tasks use a team SharePoint site (<https://usnrc.sharepoint.com/teams/AIMIPFollow-UpActions>) and a Microsoft Planner site ([https://tasks.office.com/usnrc.onmicrosoft.com/Home/PlanViews/RHcaEV2ciU2vUnnKgs6R\\_olACM65?Type=PlanLink&Channel=Link&CreatedTime=637251403268200000](https://tasks.office.com/usnrc.onmicrosoft.com/Home/PlanViews/RHcaEV2ciU2vUnnKgs6R_olACM65?Type=PlanLink&Channel=Link&CreatedTime=637251403268200000)) to track progress on this effort. Both resources are viewable by all NRC staff.

## **Status**

Beginning in May 2020, the implementation teams developed action plans for each of the above actions and began implementing the recommendations of the Expert Evaluation Team. The following summarizes the status of the implementation as of August 31, 2020.

### Action 1: Inspect Entergy Revised Pipeline Analysis

Entergy revised its pipeline hazard analysis and updated its 10 CFR 50.59 safety evaluation ((ADAMS Accession No. ML20178A485). Region I, with NRR support (including a member of the Expert Evaluation Team), inspected the updated safety evaluation and hazard analysis as part of the baseline 10 CFR 50.59 inspection for Indian Point 3 (ADAMS Accession No. ML20260H020). The staff briefed internal stakeholders on the results of the inspection and briefed external stakeholders of the results upon issuance of the inspection report. The inspection report was issued on September 16, 2020 (ADAMS Accession No. ML20260H020).

### Action 2: Conduct Effective Initial and Continuing Training on Peer Review Procedures

At the time of the issuance of the Expert Evaluation Team's report, NRR and RES already had office procedures that met the objectives of MD 3.17, "NRC Information Quality Program," which addresses certain types of peer reviews related to the use of significant scientific information in decisions. NRR enhanced its training on its procedure and rolled out the training to NRR staff; NSIR and NMSS developed new office procedures. In addition, NRR developed a Nuclepedia site that provides additional tools and checklists that could add durability and structure to peer review tasks, providing flexibility depending on the level of peer review needed. NRC plans to complete all actions by the end of CY 2020.

### Action 3: Develop Guidelines / Good Practices for Arranging Technical Support for Inspectors

The team determined that the best way to provide guidance for coordinating technical support to inspectors would be to update the Inspection Manual. The draft changes were developed in coordination with internal stakeholders and reviewed by the regions and headquarters offices (NRR, NMSS and NSIR). The updated Inspection Manual Chapter is was issued in October 2020. IMC 2515 (ADAMS Accession No. ML20084F482) update was approved on Monday Oct 5.

### Action 4: Improve the 10 CFR 2.206 Petition Review Process

The team has reviewed the Expert Evaluation Team's recommendations to improve the 10 CFR 2.206 petition review process and determined that MD 8.11 and the supporting desk guide should be modified to update the roles and responsibilities of the Petition Review Boards (PRBs) to improve effectiveness of the review process and independence of the reviews. The team is also working with management to improve efficiency by moving some of the project management responsibilities for PRBs to a single office. To date, the team has conducted

internal focus group meetings and two public meetings. The working group is currently reviewing comments received during the meetings and considering what enhancements can be made to the program.

Action 5: Update Regulatory Guide 1.91 to Address Identified Technical Issues and Clarify Analysis Expectations

Regulatory Guide 1.91, "Evaluations of Explosions Postulated to Occur at nearby Facilities and on Transportation Routes Near Nuclear Power Plants," has undergone a periodic review and the results have been made public (ADAMS Accession No. ML20134J125). The review concluded that the Regulatory Guide should be updated to expand the scope and address several technical issues, including each of those identified in the expert evaluation team's report. The Regulatory Guide is currently being revised and the updated draft Regulatory Guide is scheduled to be issued for public comment in July 2021.

Action 6: Create or Revise Guidance for Interagency Coordination to Provide for Better Documentation and Criteria for Different Levels of Participation

The team has completed informal research and communicated with National Environmental Policy Act practitioners at other agencies regarding how to best determine the level of NRC's participation in environmental impact statements (EISs) and other environmental review activities led by external agencies. The team has developed the guidance as an NMSS office procedure, associated with the environmental center of expertise and expects to finalize it in December 2020. The text is presently undergoing review by OGC and is in formal concurrence.

## **Reactor Decommissioning Activities (NMSS)**

At a high level, the steps in the process of reactor decommissioning and license termination are: (1) within 30 days of determining to permanently cease operations, the licensee submits a written certification to the NRC; (2) the licensee permanently ceases operations; (3) the licensee permanently removes fuel from the reactor vessel and certifies to the NRC that fuel has been permanently removed from the reactor vessel; (4) the licensee, before or within 2 years after permanent cessation of operations, submits a post-shutdown decommissioning activities report (PSDAR) to the NRC that describes the licensee's proposed plan for decommissioning, including a cost estimate, a description and schedule of decommissioning activities, and its discussion of why the environmental impacts will be bounded by previous environmental reviews; (5) the NRC holds a public meeting in the vicinity of the plant to discuss the PSDAR and receive public comments on the PSDAR; (6) the licensee begins major decommissioning activities in preparation for storage or dismantlement provided it has submitted the above certifications and at least 90 days have passed since submittal of its PSDAR; (7) the licensee submits the license termination plan for NRC approval at least 2 years before planned license termination; and (8) the NRC terminates the license after determining that the site has been decommissioned to the appropriate regulatory release limits. Usually, the NRC independently verifies that the licensee's final status surveys are acceptable through confirmatory surveys and sampling one or more final status survey units.

During decommissioning, licensees remain subject to NRC safety regulations, as their NRC licenses remain in effect and many operating reactor regulations continue to be applicable after permanent shutdown. NRC inspectors qualified in the decommissioning inspection program conduct periodic inspections to ensure decommissioning operations are conducted safely.

By regulation, licensees have 60 years from permanent cessation of operations to complete decommissioning. Scientific studies concluded that 50 years was the optimal time for radioactive decay and would result in radiation dose rates being reduced to 1-2% and radioactive waste volumes being reduced to about 10% of the original amounts. The NRC determined that sixty years was appropriate based on 50 years to allow radioactive decay and 10 years to complete the dismantlement and other decommissioning activities.

NRC regulations allow flexibility as to the time by which licensees may complete decommissioning, as long as decommissioning is complete within 60 years following permanent cessation of operations. At its discretion, the licensee can perform some immediate dismantling (DECON) while leaving other parts of the facility in monitored mode, begin DECON right after permanently ceasing operations and complete decommissioning without any stoppage, or defer dismantling (SAFSTOR). However, if the licensee changes its decommissioning strategy as described in its PSDAR, it must notify the NRC and the State of the change. Based on history, those plants entering DECON have typically taken about 10 years to complete the decommissioning.

The NRC has a comprehensive, regulation-based decommissioning funding oversight program in place to provide reasonable assurance that sufficient funds will be available for radiological decommissioning to NRC standards and regulations for each US commercial nuclear facility. (Note: Unlike radiological decommissioning, site restoration or "greenfielding" is not within the NRC's jurisdiction.)

Each power reactor licensee is required to report on its decommissioning funding status by March 31. Operating reactors must provide a status report every two years. Permanently shutdown reactors must provide a report annually. Each power reactor currently is compliant with this requirement and has provided reasonable assurance that sufficient funds are or will be available to complete the decommissioning of its respective site. The NRC decommissioning funding oversight program relies on the timely and accurate submittal of information concerning decommissioning funding assurance and plans for permanent cessation of operations by the licensees.

As of August 2020, the NRC is overseeing 25 permanently shutdown power reactors in various stages of decommissioning. Of the 25 permanently shutdown power reactors, 13 are undergoing active decommissioning, 11 have elected to defer dismantlement as allowed by regulation to allow for radioactive decay, and one has not yet selected a decommissioning strategy. The 13 power reactors in active DECON are: San Onofre Units 1, 2, and 3, Zion Units 1 and 2, Humboldt Bay, La Crosse, Fort Calhoun, Crystal River, Nuclear Ship Savannah (which possesses an NRC license under 10 CFR Part 50 for power reactors), Oyster Creek, Pilgrim, and Vermont Yankee. San Onofre Units 1, 2, and 3 are on a 20-year schedule to perform radiological decommissioning. Zion Units 1 and 2 have completed all physical decommissioning after being in SAFSTOR for 15 years and decommissioning is estimated to be completed early in calendar year 2021. The Humboldt Bay license termination plan was approved in 2016, and the site is in the final stages of decommissioning and is estimated to be completed by the middle of calendar year 2021. The La Crosse license termination plan was approved in 2019, and decommissioning is estimated to be completed by the end of calendar year 2020. Fort Calhoun announced the selection of EnergySolutions as the decommissioning contractor and has started active decommissioning with the removal of large reactor components in storage. Crystal River expects to complete a transfer of the license to Accelerated Decommissioning Partners (a NorthStar and ORANO partnership) on October 1, 2020, and to decommission the site by 2028. TMI-2 has requested license transfer to TMI-2 Solutions, a subsidiary of Energy Solutions. If the transfer is approved, TMI-2 would enter active decommissioning. The Nuclear Ship Savannah has completed modifications to allow access to the reactor compartment as the first step in the decommissioning process. Vermont Yankee has recently entered DECON after a license transfer from Entergy to NorthStar was approved by the NRC and expects to complete decommissioning by 2030. With the license transfer approvals in 2019 for Oyster Creek and Pilgrim, they are beginning active decommissioning.

The 11 permanently shutdown power reactors not in active decommissioning are: Dresden Unit 1; Fermi Unit 1; GE Vallecitos BWR; GE Vallecitos-ESADA-Vallecitos Experimental Superheat Reactor (EVESR); Indian Point Units 1 and 2; Millstone Unit 1; Peach Bottom Unit 1; Three Mile Island Units 1 and 2; and Kewaunee. Duane Arnold recently permanently shut down but has not yet provided a schedule for completion of decommissioning. Four additional reactors (Indian Point Unit 3, Palisades, and Diablo Canyon Units 1 and 2) have issued press releases or submitted formal notifications to the NRC stating that they will permanently shut down between 2020 and the end of 2025.

In 2013-2014, five power reactors permanently ceased operation (Kewaunee, Crystal River, San Onofre Units 2 and 3, and Vermont Yankee). These power reactor shutdowns were unexpected, involved little preplanning, and were the first reactors to transition to decommissioning from operations since 1998. In October 2016, the NRC staff issued a decommissioning lessons learned report (ADAMS Accession No. ML16176A339) that addresses the challenges experienced due to the unexpected shutdown of these five reactors prior to the expiration of their operating licenses; identifies actions the NRC staff took to address

the challenges; and provides a number of best practices and recommendations that have been or are being implemented based on the staff's lessons learned from the transition of these plants from operations to decommissioning.

In addition to commercial power reactor decommissioning, NRC staff are assisting the US Navy by providing technical expertise in the decommissioning of a Surface Ship Support Barge (SSSB) through an interagency agreement. The Navy has awarded a contract to APTIM Corporation to decommission the SSSB over the next three years.

For a permanently shutdown and defueled power reactor, the types of potential accidents are fewer and risks of radiological releases are reduced when compared to an operating reactor. During the transition to decommissioning, licensees have requested certain exemptions from NRC regulations that are applicable for operating plants and certain amendments to their licenses that reflect this reduction in risk. These licensing actions have historically been used to establish the long-term regulatory framework for power reactors in decommissioning.

After approving several exemptions for decommissioning licensees, the Commission in December 2014 (SRM-SECY-14-0118, ADAMS Accession No. ML14364A111) directed the NRC staff to begin a rulemaking to expand and enhance the reactor decommissioning regulations, with a specific focus on the transition period from operation to permanently shut down. On November 19, 2015, the NRC published an Advance Notice of Proposed Rulemaking (ANPR) in the *Federal Register* (80 FR 72358) to gather information for the rulemaking. The ANPR sought public comment on specific questions regarding possible revisions to the NRC's requirements for operating power reactors transitioning to decommissioning. The staff provided a draft proposed rule to the Commission for review and approval in May 2018 (SECY-18-0055, ADAMS Accession No. ML18012A019). Further details of this rulemaking are provided in the section of this document entitled, "Power Reactor Decommissioning Rulemaking (NMSS)."

## **San Onofre Nuclear Generating Station (SONGS) Decommissioning (NMSS)**

### **Decommissioning:**

#### Unit 1:

SONGS Unit 1 permanently ceased operation on November 30, 1992. Active decommissioning of the unit began in 2000. Decommissioning activities were completed in 2010, except for disposal of the reactor pressure vessel (RPV) and license termination. The Unit 1 site is now the location of the site industrial area and Independent Spent Fuel Storage Installation (ISFSI). During 2001 and 2002 the RPV was removed from the Unit 1 Containment Building at SONGS and placed into a specially designed transport and disposal container. The original plan was to barge ship the RPV via the Panama Canal around the tip of South America to a radiological disposal facility in South Carolina. These initial plans were rejected for various reasons and the RPV had been in temporary storage onsite at the SONGS site since then. The Unit 1 RPV was stored onsite to facilitate radioactive decay until the vessel met the definition of Class A waste. Southern California Edison (SCE), the licensee, then shipped the Unit 1 RPV offsite via a specialized rail car and then by road to the EnergySolutions disposal site in Clive, Utah. The RPV left SONGS on May 25, 2020 and safely arrived at EnergySolutions' licensed Nuclear Waste Facility in Clive, Utah for permanent disposal on July 14, 2020.

All Unit 1 fuel, as well as some Unit 2 and Unit 3 fuel, is stored using the Advanced NUHOMS Horizontal Modular Storage System located onsite at the ISFSI. SCE also plans to store its greater than Class C (GTCC) wastes from decommissioning Units 2 and 3 in the Advanced NUHOMS Horizontal Modular Storage System.

#### Units 2 and 3:

SONGS Units 2 and 3 were shut down in January 2012 due to issues with the replacement steam generators. Subsequently, the licensee elected to cease operations and the licensee certified permanent cessation of operations in June 2013. The licensee opted to decontaminate and dismantle SONGS in an approximately 20-year timeframe. SCE selected SONGS Decommissioning Solutions (SDS), a joint venture of EnergySolutions and AECOM as the general contractor. SONGS is jointly owned by SCE (78.21 percent), San Diego Gas & Electric (20 percent), and the city of Riverside (1.79 percent). SCE is authorized to act as agent for the other co-owners and has exclusive responsibility and control over the physical construction, operation, and maintenance of the facility with SDS as its contractor.

Active decommissioning work could not proceed at SONGS until the State of California completed its environmental review and issued a decommissioning permit. The Final Environmental Impact Report (EIR) was published in February 2019. After evaluating the Final EIR and feedback from the public, the California Coastal Commission unanimously voted on October 17, 2019, to approve the SONGS decommissioning permit, which allowed active dismantlement and other construction like decommissioning activities to commence at the facility.

In 2019 decommissioning activities generally consisted of planning in preparation for commencement of work, including permitting, strategic planning, and submittal of pre-construction compliance documents to the State Agencies. Dismantlement began February 24, 2020. This process will continue for approximately the next eight years. Dismantlement involves the removal of buildings, containment domes and other above-grade structures associated with Units 2 and 3 in compliance with NRC requirements, as well as the partial

removal of offshore conduits, the large pipes that brought and discharged ocean cooling water to and from the plant, and the removal of offshore buoys and anchors.

The estimated license termination date for SONGS Units 2 and 3, except for the ISFSI, is 2030, with site restoration activities to be completed by 2033. The degree of site restoration and final status of the site will depend on the site configuration required under the licensee's ongoing lease negotiations with the U.S. Navy (Camp Pendleton), which owns the SONGS site.

On May 7, 2020, SCE submitted a revised Post Shutdown Decommissioning Activities Report and Irradiated Fuel Management Plan (IFMP) for the SONGS Units 2 and 3 in accordance with 10 CFR 50.82(a)(7) (ADAMS Accession No. ML20136A339). The staff is currently reviewing it.

### **Spent Fuel Transfer:**

SONGS began loading the HI-STORM UMAX cask systems in January 2018. In March 2018, after loading the first 4 HI-STORM UMAX dry cask storage systems, workers discovered a loose part in the bottom of a spent fuel canister. This discovery resulted in SCE halting the loading of spent fuel canisters. The loose part was later determined to be a piece of a "shim standoff," a stainless steel pin attached to the bottom of an aluminum shim. SCE had ordered 74 spent fuel canisters and has worked with Holtec to eliminate the shim standoffs for 70 canisters. SCE resumed loading canisters that had the original shim design, modified to remove the shim standoffs, in late March 2018 while follow-up NRC inspection activities were underway at Holtec.

SCE halted the loading of spent fuel canisters again in August 2018 after a loaded spent fuel storage canister was misaligned as it was being lowered into the storage vault, causing it to hang up on an internal component of the vault and create the potential to fall the remaining 17 feet to the vault floor. This event, characterized as a "near miss," was the subject of an NRC Special Inspection and corrective actions were implemented and reviewed by the NRC before SCE restarted fuel movement in July 2019.

Both the shim standoff concern and the cask misalignment event were the subject of NRC inspections at Holtec and SONGS, respectively. Both inspections involved proposed findings that were discussed at pre-decisional enforcement conferences with Holtec and SCE. In March 2019, the NRC issued a final enforcement action against SCE citing two violations involving the licensee's failure to report the cask misalignment event in a timely manner and failure to provide redundant drop protection. These violations resulted in a civil penalty in the amount of \$116,000. In April 2019, the NRC issued a final enforcement action against Holtec citing two violations, one involving Holtec's design control process applicable to the addition of shim standoffs to the canister design and its screening evaluation process prior to implementing proposed changes, and the other involving the need for NRC approval before making design changes. There were no civil penalties associated with the violations. In June 2019, the NRC conducted a follow-up inspection to the April 2019 enforcement action that focused on the corrective actions taken by Holtec to prevent a future recurrence of the violation and determined that Holtec's corrective actions were adequate.

After the restart of the spent fuel transfer campaign in July 2019, the NRC staff performed unannounced inspections (monthly) at SONGS until all of the spent fuel was transferred to dry storage on August 7, 2020. The NRC staff provided oversight of several key dry cask loading evolutions and other ISFSI related activities. Specifically, the NRC has performed inspections

which covered key dry fuel storage operations, including (1) a review of SCE/Holtec dry (practice) runs; (2) training of dry cask storage personnel; (3) transfer and downloading canister #30 from the Unit 3 spent fuel pool into the UMAX ISFSI; (4) loading and downloading of canister #31 into the UMAX ISFSI; (5) Holtec canister flushing activities on site; (6) loading of a fuel canister containing damaged fuel; and (7) loading and downloading canister #32 into the UMAX ISFSI.

On August 10, 2020, SCE notified the NRC that SONGS has implemented the Security, Emergency Planning and Technical Specification License Amendments and is in an ISFSI-only configuration with the Unit 2/3 Protected Area devitalized.

Decommissioning activities at SONGS have been the subject of several legal challenges brought by Public Watchdogs, including several appeals to the U.S. Court of Appeals for the Ninth Circuit. As of September 2020, the Commission's determinations, including its denial of a 2.206 petition, have been upheld, and it is awaiting two additional decisions from that court.

### **Oyster Creek, Pilgrim, and Indian Point License Transfers (NRR)**

By letter dated September 25, 2018, Exelon Generation Co., LLC (Exelon) certified to the NRC that it had permanently ceased operations at Oyster Creek Nuclear Generating Station (Oyster Creek) on September 17, 2018, and that all fuel had been permanently removed from the reactor vessel and placed in the spent fuel pool (SFP) (ADAMS Accession No. ML18268A258). Similarly, by letter dated June 10, 2019, Entergy Nuclear Operations, Inc. (Entergy) certified to the NRC that it had permanently ceased operations at Pilgrim Nuclear Power Station (Pilgrim) on May 31, 2019, and that all fuel had been permanently removed from the reactor vessel and placed in the SFP (ADAMS Accession No. ML19161A033). As permanently shutdown and defueled facilities, and in accordance with Title 10 of the Code of Federal Regulations (10 CFR) 50.82(a)(2), these licensees are no longer authorized to operate or emplace or retain fuel in the reactor vessels.

By letters dated August 31, 2018 (ADAMS Accession No. ML18243A489), and November 16, 2018 (ADAMS Accession No. ML18320A031), the Pilgrim and Oyster Creek owners, Entergy and Exelon, respectively, independently requested transfers of their 10 CFR Part 50 licenses and the general licenses for their Independent Spent Fuel Storage Installations (ISFSIs) to Holtec Decommissioning International, Inc. (Holtec).

Under the Asset Sale License Transfer Model, a nuclear power plant owner requests a transfer of its 10 CFR Part 50 license as part of an asset purchase and sale of the nuclear power plant, land, and spent fuel to an entity with the intent to promptly decommission the plant and manage the spent fuel into the future. This model was reflected in both the Oyster Creek and Pilgrim license transfer applications. For Oyster Creek, the Holtec decommissioning completion date (excluding the ISFSI) is 2025, and for Pilgrim, the Holtec decommissioning completion date (excluding the ISFSI) is 2027. The NRC staff completed its reviews of the technical and financial qualifications of Holtec for both license transfer applications in 2019.

The NRC received six comments and two hearing requests on the Oyster Creek license transfer application. The Commission denied the hearing requests on June 20, 2019 (CLI-19-6). The Oyster Creek license transfer application was accompanied by a request for an exemption to use decommissioning trust fund (DTF) money for spent fuel management and site restoration expenses. By letter dated September 28, 2018, Holtec submitted a revised Oyster Creek Post-Shutdown Decommissioning Activities Report (PSDAR) applying the prompt decommissioning approach (DECON), which the NRC staff treated as a supplement to the license transfer application. The NRC staff relied on the revised PSDAR as a reference for the applicants' decommissioning plans (decommissioning cost estimate, schedule, etc.) (ADAMS Accession No. ML19095A457). On June 20, 2019, the NRC staff approved the Oyster Creek license transfer application (ADAMS Accession No. ML19095A454) and issued the requested exemption (ADAMS Accession No. ML19170A275). On July 1, 2019, after confirmation of the sale, the NRC staff issued the conforming amendment (ADAMS Accession No. ML19164A155). Separate from the licensing transfer proceedings, on December 5, 2019 (ADAMS Accession No. ML19304A079), the NRC staff completed its review of the revised Oyster Creek PSDAR for prompt decommissioning against the applicable requirements of 10 CFR 50.82.

For the Pilgrim license transfer application, the NRC received 38 comments and two hearing requests. The NRC staff also held a public meeting on January 15, 2019, in Plymouth, Massachusetts and received comments from the public regarding the license transfer application. The Pilgrim license transfer application was accompanied by a request for an

exemption to use DTF money for spent fuel management and site restoration expenses. By letter dated November 16, 2018 (ADAMS Accession No. ML18320A040), Holtec submitted a revised Pilgrim PSDAR applying the DECON or prompt decommissioning approach, which the staff treated as a supplement to the license transfer application. On December 17, 2018 (ADAMS Accession No. ML18333A240), the NRC notified Entergy that the staff is treating the Holtec PSDAR as a supplement to the Pilgrim license transfer application. The NRC staff reviewed the revised PSDAR only to determine whether Holtec Pilgrim and HDI are financially and technically qualified to hold the license for Pilgrim and the general license for the Pilgrim ISFSI, as described in the application, and to engage in the proposed maintenance and decommissioning activities associated with the Pilgrim site. The NRC staff approved the Pilgrim license transfer application and issued the requested exemption on August 22, 2019 (ADAMS Accession Nos. ML19170A147 and ML19192A086, respectively). On August 26, 2019 (ADAMS Accession No. ML19239A037), Entergy informed the NRC that the Pilgrim license transfer transaction closed on August 26, 2019. On August 27, 2019 (ADAMS Accession No. ML19235A050), the NRC issued the conforming amendment to reflect that Holtec is the Pilgrim licensee. The Commonwealth of Massachusetts filed a petition for review of these decisions in the D.C. Circuit, and the NRC moved to dismiss the petition because the underlying decisions were still pending before the Commission.

On September 3, 2019, the participants with hearing requests pending before the Commission, the Commonwealth of Massachusetts and Pilgrim Watch, filed motions to stay the effectiveness of the NRC staff's order approving the license transfer application and the NRC staff's issuance of the exemption. On September 25, 2019, Massachusetts petitioned the D.C. Circuit Court for review of NRC staff's August 22, 2019 order (which, as noted above, had approved the transfer pending disposition of requests for certain review by the NRC Commissioners) and certain other ancillary approvals and findings (No. 19-1198). On December 17, 2019, the Commission denied the stay requests (CLI-19-11). Massachusetts filed a separate petition for review of CLI-19-11 in the D.C. Circuit in January 2020 (No 20-1019).

Massachusetts withdrew its hearing request (ADAMS Accession No. ML20171A676) in light of a settlement agreement between Massachusetts and Holtec for the Pilgrim facility. As a result, the related petitions (No. 19-1198 (consolidated with No. 20-1019)) filed by the Commonwealth of Massachusetts in the D.C. Circuit associated by the Commonwealth of Massachusetts were dismissed. The Commission has not yet ruled on the Pilgrim Watch hearing request.

Separate from the licensing and adjudicatory proceedings, on October 28, 2019 (ADAMS Accession No. ML19224A540), the NRC staff completed its review of the revised Pilgrim PSDAR for prompt decommissioning against the applicable requirements of 10 CFR 50.82.

Indian Point Nuclear Generating (Indian Point) Unit 1 (IP1) shut down on October 31, 1974, and the unit's fuel has been transferred to 5 ISFSI dry storage casks. The IP1 NRC order approving SAFSTOR occurred in January 1996.

On February 8, 2017, Entergy notified the NRC that it had entered into an agreement with the State of New York and Riverkeeper, Inc. under which Indian Point Units 2 and 3 would permanently cease operations by April 30, 2020, and by April 30, 2021, respectively, subject to operating extensions through, but not beyond, 2024 and 2025, respectively (ADAMS Accession No. ML17044A004). On May 12, 2020, Entergy certified to the NRC that it had permanently ceased operations at Indian Point Unit 2 on April 30, 2020 (ADAMS Accession No. ML20133J902). The licensee also certified that, as of May 12, 2020, all fuel had been

permanently removed from the Indian Point Unit 2 reactor vessel and placed in the Indian Point Unit 2 spent fuel pool.

Entergy has requested various licensing actions to support the planned shutdown and transition to decommissioning status for Indian Point Units 2 and 3. The NRC has completed its review for most of the submitted decommissioning-related licensing actions, including those regarding the emergency plan and emergency action levels and staffing and training requirements, reports, and programs that will no longer be applicable for a reactor that is permanently defueled. The permanently defueled technical specifications (TSs) for Unit 2 were issued in April 2020; the completion of the staff's review of the permanently defueled TSs for Unit 3 is projected for May 2021.

On November 21, 2019, Entergy submitted an application for approval of the transfer of the Operating Licenses for Indian Point Units 1, 2, and 3 and the general license for the Indian Point independent spent fuel storage installation to subsidiaries of Holtec International; as well as the transfer of Entergy's operating authority (i.e., its authority to conduct licensed activities at Indian Point) to Holtec Decommissioning International, LLC (HDI) (ADAMS Accession No. ML19326B953).

HDI submitted its PSDAR on December 19, 2019 (ADAMS Accession No. ML19354A698), which the NRC staff is treating as a supplement to the license transfer application.

The license transfer application, as supplemented, is under NRC staff review. Entergy has stated that it is targeting a consummation of the transfer transaction in May 2021, after IP3 has been permanently shut down and defueled. The NRC also received a request from HDI for NRC approval of an exemption to make withdrawals from the Indian Point nuclear decommissioning trust funds for spent fuel management and site restoration activities. The completion of the staff's review of the license transfer application and exemption request is projected for December 2020. Pending completion of the license transfer application review, the PSDAR is not actively under NRC staff review.

On January 23, 2020, the Indian Point license transfer application was published in the Federal Register for public comment and opportunity to request a hearing (85 FR 3947). In February 2020, the State of New York filed a request for a hearing and submitted three contentions challenging the proposed license transfer. Additional requests for hearing were filed by Safe Energy Rights Group, Inc. (one contention); Town of Cortlandt, Village of Buchanan, and Hendrick Hudson School District (two contentions); and Riverkeeper, Inc. (one contention). These requests are currently pending before the Commission.

### **Diablo Canyon Decommissioning (NMSS)**

By letter dated November 27, 2018 (ADAMS Accession No. ML18331A553), Pacific Gas and Electric Company (PG&E), the licensee for Diablo Canyon Nuclear Power Plant (DCPP) Units 1 and 2, informed the NRC of its intention to permanently cease operation of DCPP, Units 1 and 2 on November 2, 2024, and August 26, 2025, respectively, at the expiration of the current operating licenses.

PG&E has initiated the decommissioning planning activities between now and permanent cessation to accelerate the decommissioning schedule. By letter dated December 13, 2018 (ADAMS Accession No. ML18347B552), PG&E submitted a request for exemptions from the requirements of 10 CFR 50.82 to allow it to use an amount of funds from the DCPP Nuclear Decommissioning Trust (NDT) for decommissioning planning above the amount limitations specified in the NRC regulations for operating reactors and to use withdrawals from the NDT for planning activities associated with spent fuel management and site restoration, in addition to radiological decommissioning. By letter dated September 10, 2019 (ADAMS Accession No. ML19163A104), the NRC staff approved the requested exemptions.

On December 4, 2019, PG&E submitted the DCPP Post-Shutdown Decommissioning Activities Report (PSDAR) (ADAMS Accession No. ML19338F173). According to the PSDAR, PG&E plans to complete decommissioning by 2038. Consistent with 10 CFR 50.82(a)(4)(ii), the NRC staff scheduled a Category 3 Public Meeting for March 2020 in San Luis Obispo to obtain public comments on the PSDAR. However, the staff subsequently conferred with PG&E and local officials and decided to defer the PSDAR public meeting until restrictions related to the COVID 2019 public health emergency are relaxed.

## **Small Modular Reactor (SMR) Application Reviews (NRR)**

The NRC staff recently issued the final safety evaluation report (FSER) for the NuScale small modular reactor (SMR), the first for an SMR design, within the 42-month schedule. Also, the NRC has received several topical reports for GE-Hitachi's (GEH) BWRX-300 SMR design, and expects to engage in pre-application interactions with Tennessee Valley Authority (TVA) for one SMR combined license (COL) application in fiscal year 2021. The NRC staff is also making progress in resolving technical and policy issues that will need to be addressed during these reviews (e.g., currently developing Interim Staff Guidance (ISG) for how the NRC would process an application under 10 CFR Part 50). This ISG will address feedback from both internal and external stakeholders to update and clarify the 1979 RG 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)." Current and anticipated applications for SMR reviews are discussed below.

### **NuScale**

Following pre-application engagement with the NRC staff, which included a Readiness Assessment of the NuScale design certification application (DCA) in September 2016 and the staff's issuance of several letters addressing technical and regulatory perspectives on the anticipated design, NuScale submitted its application for a design certification in accordance with 10 CFR Part 52 for an SMR on January 12, 2017. On March 15, 2017, the NRC completed its acceptance review and docketed the application. The staff published notice of the docketing and acceptance of the application in the *Federal Register* on March 20, 2017. The staff issued the acceptance review letter to NuScale on March 23, 2017, and developed a full review schedule with public milestones. The staff identified 29 significant and challenging issues requiring resolution and that had the potential to adversely affect the review schedule.

On January 17, 2019, the staff issued a letter to NuScale communicating the current status of the DCA review. The letter stated that, overall, NuScale and the staff had made substantial progress in bringing issues to closure, and the staff anticipated meeting the Phase 2 public milestone date of May 16, 2019, for the majority of the review areas; however, because of delays in the resolution of several challenging issues, some parts of the review did not meet this public milestone. Although the Phase 2 milestone was partially missed, the staff was confident that, if timely resolution of the remaining issues was achieved, the overall 42-month schedule could be met. The staff completed Phase 3 of the review on July 12, 2019, and Phase 4 on December 12, 2019, on schedule.

In late February 2020, NuScale initiated a Condition Report (CR) and notified NRC of a scenario for steam space small break loss of coolant accidents (LOCA) that was not bounded by its Phase 4 analysis of boron redistribution during design basis events. The identified issue was significant enough that NuScale chose to re-design parts of the Emergency Core Cooling System (ECCS) system and re-evaluated its ECCS actuation setpoints and logic to ensure a diluted water slug cannot be flushed into the core. NuScale also evaluated design changes to address the presence of diluted water in the downcomer during extended operation on the Decay Heat Removal System. The design change was complex and safety significant.

NuScale's design changes occurred during the staff's Phase 5 efforts to brief the ACRS on these related topics; and resulted in the staff postponing its original Phase 5 milestone completion date of June 23, 2020. NuScale submitted its final design changes on May 20, 2020, and the staff then initiated an audit (ADAMS Accession No. ML20160A224) and began its

review of the design changes. After spending the majority of June evaluating the changes, the staff concluded its review by reaching its reasonable assurance finding and briefed the ACRS that the design changes were adequate to ensure that the Commission's regulations would be met and the public health and safety would be protected.

The staff received both closure letters from the ACRS on July 29, 2020, for the "NuScale Area of Focus – Boron Redistribution" issue (ADAMS Accession No. ML20210M890), and their final "Report on the Safety Aspects of the NuScale Small Modular Reactor" (ADAMS Accession No. ML20211M386). The receipt of these letters then allowed the staff to close its Phase 5 review on July 31, 2020, just one month after the Phase 5 public milestone. The staff's Phase 6 milestone, the issuance of the final safety evaluation report (SER) was completed on August 28, 2020, one week ahead of the September 8, 2020, schedule.

Based on NuScale's submitted design, and the approved FSER (ADAMS Accession No. ML20023A318), the staff continues its rulemaking efforts under Subpart B, "Standard Design Certifications." The purpose of the rulemaking is to amend 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," to certify the NuScale standard design. In doing so, the staff is currently developing the *Federal Register* notice for the proposed rule that highlights several significant technical issues that were resolved during the review of NuScale, and it identifies three issues as not resolved within the meaning of 10 CFR 52.63(a)(5). These three issues, that NuScale has insufficient information regarding: (1) shield wall design between the power module and the reactor building steam gallery; (2) containment leakage from combustible gas monitoring; and (3) steam generator tube structural and leakage integrity during density wave oscillations; will not be certified by rule and will have to be addressed by a construction permit or combined license applicant that references the NuScale standard design in a future license application. Although the staff needs additional information to make the ultimate safety finding about these issues, the staff has determined that this information can be provided by the combined license or construction permit applicant. Currently, the proposed rule proposed is scheduled to be sent to Commission on or before November 20, 2020.

The staff is also currently engaged in pre-application activities with NuScale for their proposed new standard design approval (SDA) application (i.e., SDA 720). The SDA would incorporate changes to the NuScale design that include an increase in thermal power output along with updates that improve commercial viability. The SDA application submittal is planned for November 2022. In support of the SDA submittal, the staff is currently reviewing two topical reports (TRs), and expects a third TR to be submitted by the end of 2020. Four additional TRs will be submitted during calendar year 2021, and three TRs are planned for 2022, which would complete the SDA's pre-application phase.

### **Tennessee Valley Authority (TVA)**

TVA submitted an application on May 12, 2016, for an Early Site Permit (ESP) for two or more SMR modules at the Clinch River Nuclear Site, which is adjacent to Oak Ridge National Laboratory. This application was based on a plant parameter envelope characterizing several small modular light water reactor (LWR) designs. By December 30, 2016, TVA had submitted all supplemental information to the NRC in support of its application, and by letter dated January 5, 2017, the NRC staff informed TVA that its application, as supplemented, was accepted for docketing and detailed technical review.

The NRC staff began its detailed technical review of the ESP application in January 2017 and issued a full review schedule with public milestones on March 17, 2017. The staff completed key review milestones of the safety review for all chapters of the application on August 4, 2017, October 17, 2018, and December 6, 2018, respectively. The NRC staff issued its final environmental impact statement in April 2019, three months ahead of the public milestone, and its FSER on June 14, 2019, two months ahead of the public milestone. The staff submitted its testimony in support of the uncontested or “mandatory” hearing on June 21, 2019, and the Commission conducted the hearing on August 14, 2019. The Commission issued its decision approving the issuance of the ESP on December 17, 2019, and the staff issued the ESP on December 19, 2019.

### **GEH BWRX-300**

On September 26, 2019, the NRC staff and GE Hitachi (GEH) commenced public discussions of pre-application activities for the Boiling-Water Reactor (BWR)X-300 small modular reactor design. The topic of the meetings were BWRX-300 design and concepts, licensing plan and schedule, and near-term plans to submit TRs in support of future BWRX-300 licensing.

Subsequently, GEH indicated that it intends to combine with an existing approved site to submit an application for a construction permit under 10 CFR Part 50 no earlier than December 2021. In advancing towards this goal, in December 2019 and March 2020, GEH submitted three TRs on the following topics: (1) Reactor Pressure Vessel Isolation and Overpressure Protection; (2) Containment Performance; and (3) Reactivity Control. The staff completed its review of the first TR and issued a safety evaluation concluding that the TR was consistent with governing regulatory requirements and, therefore, acceptable. The NRC staff presented these findings to both the ACRS Sub-and-Full Committees and has received their endorsement. Staff is currently working with GEH to finalize this first TR and to develop the “-A” version. Staff reviews of the other TRs are underway including the acceptance review of a fourth TR that was submitted to the staff in September 2020 entitled “Containment Evaluation Method” that provides a proposed methodology for the GOTHIC and TRACE codes.

GEH has tentatively indicated a timeline of future TR submittals as follows:

- Containment Evaluation Method (Submitted to NRC September 25, 2020)
- Severe Accident Management (Jan/Feb 2021)
- Source Term Methodology (Feb/Mar 2021)

GEH indicated its intent to submit at least five other TRs to the NRC for review and approval in advance of (or concurrent with) an application for a construction permit. At present, GEH has indicated that it intends to submit a construction permit application in during the first quarter of fiscal year 2022.

### **Holtec SMR-160**

On July 9, SMR, LLC (a Holtec International Company), submitted a letter to the NRC staff stating their intent to initiate pre-application licensing engagement for their SMR-160 technology (i.e., light-water small modular reactor). This letter was a voluntary response to NRC Regulatory Issue Summary 2017-08, which encouraged prospective licensing applicants to have early discussions and pre-application review and engagement consistent with the NRC staff’s policy. Additionally, in their letter, SMR, LLC states that they are interested in holding a first technical

meeting as early as September 2020 with the NRC staff on the SMR-160 design and to discuss a mutually agreeable regulatory engagement plan for licensing submissions.

### **Utah Associated Municipal Power Systems (UAMPS), Carbon Free Power Project (CFPP)**

UAMPS is planning to develop a COL application for the CFPP for a site at the Idaho National Laboratory (INL) complex, and the application would likely reference the NuScale SMR design. Partial financial support for the UAMPS/CFPP will potentially be provided through a DOE multi-year award that would support project development costs through the commercial operation date. The DOE award is subject to pending Congressional appropriations decisions. NRC staff has had several high-level pre-application interactions with UAMPS and visited the potential sites with UAMPS representatives at the INL complex in October 2019. Preliminary site characterization activities of potential sites by UAMPS at the INL complex started in early calendar year (CY) 2020 and are currently ongoing (meteorological data collection and geophysical investigations), and more are planned for the spring of CY 2021. These activities are being performed to support a target date for COL application submission to NRC in mid-CY 2023.

## **Large Light Water Reactor (LLWR) Application Reviews (NRR)**

### **Design Certification Rule (DCR) Application Reviews**

The NRC staff has recently completed its review of one design certification rule (DCR) renewal application for the Advanced Boiling Water Reactor (ABWR) design, and has requested Commission approval for a rulemaking effort that would extend the duration of the Advanced Passive (AP)1000 design certification (DC) for an additional 5 years.

On September 5, 2020, the staff sent a rulemaking plan to the Commission for the Westinghouse AP1000 DC to extend the duration of the AP1000 DC for 5 years to allow it to remain valid while the agency completes the Part 50/52 rulemaking effort (ADAMS Accession No. ML20196L654). The AP1000 DC currently expires on February 27, 2021. In an exemption to the timely renewal requirement under 10 CFR 52.57(a) granted in February 2018 (ADAMS Accession No. ML17265A099), the NRC staff deferred by 5 years the period during which Westinghouse may submit a timely application to renew the AP1000 DC. The period now begins on February 27, 2023; and ends on February 27, 2025. Upon expiration, a combined license (COL) applicant referencing the AP1000 DC will no longer benefit from issue finality for the AP1000 design. However, by letter dated June 26, 2020 (ADAMS Accession No. ML20178A640), Westinghouse requested that the NRC extend the duration of the AP1000 DC by an additional 5 years.

This recommended extension would allow the AP1000 DC to remain valid for reference while the NRC considers potential changes to the duration and renewal of future and currently valid DCs in a separate, ongoing rulemaking. Specifically, as described in SECY-19-0084, "Status of Rulemaking to Align Licensing Processes and Lessons Learned from New Reactor Licensing," (ADAMS Accession No. ML19161A194), the staff is considering whether the requirements to renew a certified design should be modified or eliminated via a proposed rulemaking.

To date, the NRC staff has issued design certifications for the following six reactor designs: (1) General Electric Nuclear Energy's Advanced Boiling Water Reactor (ABWR), (2) Westinghouse Electric Company, LLC's (Westinghouse's) System 80+, (3) Westinghouse's Advanced Passive (AP) 600 design, (4) Westinghouse's AP1000, (5) General Electric-Hitachi's Economic Simplified Boiling Water Reactor (ESBWR), and (6) KHNP's APR1400. In December 2011, the NRC staff issued amendments to the AP1000 and ABWR design certification rules.

AREVA, Inc., submitted the U.S. EPR DC application on December 11, 2007. On February 25, 2015, AREVA, Inc., requested that the NRC suspend the application review until further notice. The NRC staff's review of the U.S. EPR DC application remains in suspension.

By letter dated March 3, 2020, Mitsubishi Heavy Industries, Inc., requested that the staff suspend its review of the design certification application for the US-Advanced Pressurized Water Reactor (APWR). The applicant has given no indication when they will request that the staff resume its review.

### **Combined License (COL) Application Reviews**

The NRC staff has received a total of 18 COL applications to date. The NRC has issued COLs at 8 sites for 14 units (Vogtle, Units 3 and 4; Virgil C. Summer Nuclear Station (V.C. Summer), Units 2 and 3; Fermi, Unit 3; South Texas Project, Units 3 and 4; Levy Nuclear Plant, Units 1

and 2; William States Lee III Nuclear Station, Units 1 and 2; North Anna Power Station, Unit 3; and Turkey Point, Units 6 and 7). The NRC has suspended two COL application reviews at the request of the applicants because of changes in their business plans (Shearon Harris Nuclear Power Plant and Comanche Peak Nuclear Power Plant). Eight COL applications have been withdrawn (Bellefonte Nuclear Station, River Bend Station, Bell Bend Nuclear Power Plant, Victoria County Station, Nine Mile Point Nuclear Station, Callaway Plant, Calvert Cliffs Nuclear Power Plant, and Grand Gulf Nuclear Station).

Currently, there are five licensees with combined licenses for a total of eight units. They include the licensees for Fermi Unit 3, North Anna Unit 3, Vogtle Units 3 and 4, Lee Units 1 and 2, and Turkey Point Units 6 and 7. The licensees for the COLs for V.C. Summer, Units 2 and 3, Levy Nuclear Plant, Units 1 and 2, and South Texas Project (STP), Units 3 and 4, have each requested and received termination of their COLs.

The NRC is not currently reviewing any active LLWR COL applications, nor is it currently expecting any new COL applications for an LLWR.

### **Early Site Permit (ESP) Application Reviews**

To date, the NRC staff has issued ESPs for the following six sites: (1) Clinton site in Illinois, (2) Grand Gulf site in Mississippi, (3) North Anna site in Virginia, (4) Vogtle site in Georgia, (5) PSEG site in New Jersey, and (6) Clinch River site in Tennessee (for small modular reactors).

The NRC is not currently reviewing any active LLWR ESP applications, nor is it currently expecting any new ESP applications for an LLWR.

## **Licensing Advanced Reactor Technologies (NRR)**

The staff has a number of ongoing activities to support licensing non-light water reactors (non-LWRs), many of which support the activities required by Section 103 of the Nuclear Energy Innovation and Modernization Act (NEIMA), which was signed into law on January 14, 2019. As required by Section 103 of NEIMA, the NRC sent two reports to Congress in July 2019 (ADAMS Accession No. ML19128A289) regarding (1) expediting and establishing stages in the licensing process for commercial advanced nuclear reactors, and (2) increasing, where appropriate, the use of risk-informed and performance-based evaluation techniques and regulatory guidance in licensing commercial advanced nuclear reactors within the existing regulatory framework. The NRC also provided staff training to support preparations for preapplication interactions and commercial advanced reactor license application reviews. Finally, the staff has begun efforts to establish a technology-inclusive regulatory framework for optional use by commercial advanced nuclear reactor applicants for new reactor license applications. On April 13, 2020, the staff provided its rulemaking plan to the Commission in SECY-20-0032, "Rulemaking Plan on "Risk Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors (RIN-3150-AK31; NRC-2019-0062)." The NRC plans to complete this rulemaking in accordance with direction received from the Commission and before the deadline set by NEIMA of December 31, 2027.

On March 11, 2020 (ADAMS Accession No. ML20075A000), Oklo Power LLC (Oklo) submitted a custom combined license (COL) application to build and operate the company's Aurora reactor at the Idaho National Laboratory site in Idaho. This COL application is the first for an advanced non-LWR design. The application was accepted by the NRC for review on June 5, 2020 (ADAMS Accession No. ML20149K616), and the review is now underway. In addition, the staff has begun preapplication interactions with the following advanced reactor developers: X-Energy, LLC (X-Energy), in September 2018 on its pebble bed high-temperature gas-cooled reactor; Kairos Power in October 2018 on its pebble-fueled, molten-fluoride-cooled reactor; Terrestrial Energy USA on its integral molten salt reactor in April 2020; and Terrapower on its sodium fast reactor in July 2020. The staff is also engaged with X-Energy on preapplication interactions for a fuel fabrication facility to produce tristructural isotropic fuel. The staff anticipates starting additional preapplication interactions in fiscal year (FY) 2021 with Flibe, General Atomics, Radiant Nuclear, Ultra Safe Nuclear Corp., and Westinghouse Electric Company, LLC.

To prepare to review and regulate a new generation of non-LWRs, the NRC developed a vision and strategy document and implementation plans (IAPs) to ensure the agency's readiness to effectively and efficiently conduct its mission for these technologies. On January 30, 2020, the staff issued SECY-20-0010, "Advanced Reactor Program Status," (ADAMS Accession No. ML19331A034), to provide the Commission an update of the staff's activities related to advanced reactors, including the progress and path forward on each of the IAP strategies.

### **IAP Strategy 1 – Staff Development and Knowledge Management**

The NRC is acquiring and developing the necessary knowledge, technical skills, and capacity to perform non-LWR regulatory activities. The NRC contracted with U.S. Department of Energy (DOE) National Laboratories to develop and offer sodium-cooled fast reactor training, high-temperature gas-cooled reactor training, and molten salt reactor training. All three courses are available on video for additional NRC staff to take in the future.

## **IAP Strategy 2 – Analytical Tools**

The NRC is acquiring and developing sufficient computer codes and tools to perform non-LWR regulatory reviews. In the near-term, these efforts focus on reactor kinetics and criticality, fuel performance, thermal-fluid phenomena, severe accident phenomena, offsite consequence analysis, materials and component integrity, and probabilistic risk assessment (PRA). The staff drafted reports that provide a coherent basis and technical rationale for selection of the computer codes, and related development activities, in support of safety reviews of non-LWR designs. The reports describe the factors used to select the codes, the work necessary to achieve readiness to support the safety reviews, and the approach that will be taken in prioritizing resources for code development activities. After engaging with stakeholders and the Advisory Committee on Reactor Safeguards (ACRS), the staff finalized these reports in January 2020 (ADAMS Accession No. (ML20030A171)). Additional volumes are under development to address radiation protection and fuel cycle code assessment and development.

## **IAP Strategy 3 – Regulatory Framework**

The NRC is working to optimize the regulatory framework for non-LWR reviews and licensing processes. The key technology-inclusive, risk-informed, and performance-based activities under this strategy include the following:

1. Licensing Modernization Project (LMP): On June 9, 2020, the NRC issued Regulatory Guide (RG) 1.233, "Guidance for a Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light Water Reactors." This RG endorses the LMP methodology, described in Nuclear Energy Institute (NEI) 18-04, Revision 1, "Risk-Informed Performance-Based Guidance for Non-Light Water Reactor Licensing Basis Development," as one acceptable method for non-LWR designers to use for identifying licensing basis events; categorizing structures, systems, and components; and evaluating defense in depth for advanced reactor designs. The issuance of this RG was supported by the Commission's approval in May 2020, of the staff's recommendation in SECY-19-0117, "Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors." In approving the staff's recommendation, the Commission agreed that the use of the LMP methodology is a reasonable approach for establishing key parts of the licensing basis for non-LWRs. This first-of-a-kind effort brings to resolution long-standing policy issues, supports the NRC's goal of being a modern risk-informed regulator, and lays the foundation for the new NEIMA-required technology-inclusive, risk-informed, and performance-based regulatory framework for advanced reactors.
2. Technology Inclusive Content of Application Project (TICAP): The staff has begun interactions with the TICAP, a DOE cost-share initiative led by Southern Company and coordinated through the NEI Advanced Reactor Regulatory Taskforce. TICAP will build on the LMP licensing approach to develop a methodology and guidance to inform the appropriate scope and level of detail to be provided in non-LWR applications.
3. Environmental Review Guidance: The staff has developed draft guidance for environmental reviews for micro-reactors that appropriately scales the depth and scope of content of the environmental documentation prepared by the staff. This guidance is based on an acknowledgement of the expected design features and smaller size of advanced micro-reactors (e.g., reduced radionuclide inventories and enhanced safety features) when

compared to large light-water reactors which could simplify and shorten environmental reviews. The draft guidance was issued for public comment on February 26, 2020, and the guidance will be finalized in CY 2020. The staff is also developing a Generic Environmental Impact Statement (GEIS) for advanced nuclear reactors (ANR) as described in SECY-20-0020, "Results of Exploratory Process for Developing a Generic Environmental Impact Statement for the Construction and Operation of Advanced Nuclear Reactors," (ADAMS Accession No. ML20052D175). In its SRM dated September 21, 2020, (ADAMS Accession No. ML20265A112), the Commission approved the development of a GEIS for ANRs using a technology-neutral, plant parameter envelope (PPE) approach that is inclusive of as many ANR technologies as possible and for it to be codified in the Code of Federal Regulations.

#### **IAP Strategy 4 – Consensus Codes and Standards**

The NRC is working to facilitate the development of industry codes and standards to support the non-LWR life cycle. The staff is actively participating in subgroups and working groups associated with the development of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section III, Division 5. ASME B&PV Code, Section III, Division 5 provides rules for the design, construction, testing, certification, and quality assurance of high-temperature reactors and covers the use of metallic, graphite, and composite materials. The NRC has identified the 2017 Edition of this standard for potential endorsement. On June 21, 2018, ASME confirmed that advanced reactor developers support NRC endorsement of the 2017 Edition of ASME B&PV Code, Section III, Division 5 (ADAMS Accession No. ML18184A065). The staff will continue to update industry stakeholders on the progress of this project at future Advanced Reactor Stakeholder meetings.

The staff is also actively participating on several American Nuclear Society (ANS) standards working groups and consensus committees related to non-LWR safety standards and the joint ASME/ANS advanced non-LWR PRA standard. On February 7, 2019, the NRC Standards Executive issued a letter to the ASME Board Chair and ANS Standards Board Chair (ADAMS Accession No. ML19031C904) communicating the priority of various PRA standard development activities. The NRC identified completion of the advanced non-LWR PRA standard as a high priority consistent with the requirements of NEIMA. The staff discussed its plan for endorsement of the standard with stakeholders and the ACRS during several public meetings. The staff remains actively involved in the non-LWR PRA standard committee and supported the development of the draft standard. The staff has initiated the process for potential formal endorsement of the final standard.

#### **IAP Strategy 5 – Resolution of Policy Issues**

The NRC is identifying and resolving technology-inclusive policy issues that affect regulatory reviews, siting, permitting, and licensing of non-LWR nuclear power plants. The technology-inclusive policy issues that the NRC staff has discussed with stakeholders include the following:

1. Siting: On May 8, 2020, the staff issued SECY-20-0045, "Population Related Siting Considerations for Advanced Reactors," (ADAMS Accession No. ML19262H055) to provide options and a recommendation to the Commission on possible changes to guidance documents to address population-related siting considerations for advanced reactors. The staff's recommendation is to pursue a revision to the population-related siting guidance used to implement Commission policy to provide technology-inclusive, risk-informed, and

performance-based criteria to assess certain population-related issues in siting advanced reactors.

2. Offsite Emergency Planning: Consistent with the Commission's direction, the NRC staff developed and published a proposed rule in the Federal Register (85 FR 28436) for public comment on May 12, 2020. This proposed rule would provide licensees and applicants the option to use alternative emergency preparedness requirements for SMRs and other new technologies. The proposed alternative emergency preparedness requirements would adopt a consequence-oriented, risk-informed, and performance-based approach. In part, this rulemaking would reduce potential requests for exemptions from the current emergency preparedness requirements and promote regulatory stability, predictability, and clarity in the licensing process for these future facilities. The staff discussed the proposed rulemaking approach during a public meeting on June 24, 2020 and will continue to keep stakeholders informed as it prepares the draft final rule for Commission approval.
3. Insurance and Liability: In accordance with the latest version of the Price-Anderson Act, by December 31, 2021, the NRC will prepare a report to Congress, and an associated SECY paper for the Commission's consideration, recommending the need for continuation or modification of the provisions of the Price-Anderson Act. This report and SECY paper will address any changes that the staff recommends for non-LWRs and SMRs. The staff engaged stakeholders on this topic during a public meeting on November 2, 2017, and the staff will continue to keep stakeholders informed as it prepares the report to Congress.
4. Security and Safeguards Requirements: In accordance with Commission direction in the November 19, 2018, SRM to SECY-18-0076, "Options and Recommendation for Physical Security for Advanced Reactors," the staff has initiated a limited-scope revision to regulations and guidance related to physical security for advanced reactors. The staff prepared a regulatory basis, which was published in the Federal Register on July 16, 2019, for public comment (ADAMS Accession No. ML19099A006). The staff has held four public meetings and in advance of the April 2020 public meeting, preliminary proposed rule language and draft implementation guidance submitted by NEI were made publicly available. On September 14, 2020, revised preliminary proposed rule language was published in the Federal Register (85 FR 56548). The preliminary proposed rule language sets forth four alternative security requirements for certain existing physical security requirements found in 10 CFR 73.55. It also sets forth eligibility criteria that must be met before an advanced reactor licensee may use one or more of the alternative security requirements.
5. Functional Containment Performance: On September 28, 2018, the staff issued SECY-18-0096, "Functional Containment Performance Criteria for Non-Light-Water Reactors," recommending Commission approval of a proposed methodology for establishing functional containment performance criteria for non-LWRs in a manner that is technology inclusive, risk-informed, and performance-based. In SRM-SECY-18-0096, dated December 4, 2018, the Commission approved the staff's proposed methodology for establishing functional containment performance criteria for non-LWRs. The staff has incorporated the methodology for functional containment performance criteria into RG 1.233.
6. Micro-Reactors: The NRC staff has met with individual designers, DOE, and the Department of Defense regarding "micro-reactors." Micro-reactors, which are generally small (on the order of one to tens of MW-thermal), are envisioned to perform non-traditional roles for nuclear power, such as providing power for defense sites and remote areas. Micro-

reactors are anticipated to have reduced reliance on complex safety systems, use more inherent safety features, and have lower potential consequences as a result of any postulated accidents. The NRC staff has identified a number of potential policy and licensing issues that may need to be addressed for micro-reactors, including security requirements, emergency preparedness, staffing requirements, remote operation, aircraft impact, oversight, annual fee structure, manufacturing licenses, transportable reactors, siting, and environmental reviews. The staff discussed these issues with the ACRS Future Plant Subcommittee on August 29, 2019 and engaged stakeholders on these topics during a public meeting held on October 17, 2019. These and future interactions will inform the staff's evaluation of these potential policy issues.

### **IAP Strategy 6 – Communications**

As part of near-term IAP Strategy 6, the NRC is optimizing communications. The NRC conducts public meetings with stakeholders every 4 to 6 weeks. The NRC continues to meet with potential applicants upon request and to share information with various international groups, including the Organization for Economic Co-operation and Development's Nuclear Energy Agency, the International Atomic Energy Agency, the Generation IV International Forum, and the NRC's international regulatory counterparts. The NRC chairs the Nuclear Energy Agency's Working Group on the Safety of Advanced Reactors for international regulators of non-LWRs. The purpose of the group is to bring interested regulators together to discuss common interests, practices, and problems and to address both the regulatory interests and research needs in support of nuclear safety and security. In August 2019, the NRC entered into a Memorandum of Cooperation with the Canadian Nuclear Safety Commission to further expand cooperation on activities associated with advanced reactor and SMR technologies. This includes cooperation in the development of shared advanced reactor and SMR technical review approaches, collaboration on pre-application activities, and collaboration on research, on training, and in the development of regulatory approaches to address unique and novel technical considerations for ensuring the safety of advanced reactors and SMRs.

Also, in support of IAP Strategy 6, the NRC has frequent interactions with DOE, including periodic management meetings and telephone calls. The NRC and DOE have also signed memorandum of understanding (MOUs) for the DOE Gateway for Accelerated Innovation in Nuclear initiative, the versatile test reactor, and the Nuclear Energy Innovation Capabilities Act of 2017. The NRC and DOE also put in place in 2020 an addendum to an existing MOU covering the DOE and NRC roles and responsibilities regarding the DOE Advanced Reactor Demonstration Program.

### **New Reactor Construction (NRR)**

Two AP1000 units are currently under construction in the U.S. at Southern Nuclear Operating Company's (SNC's) Vogtle site in Georgia.

The NRC created the Vogtle Readiness Group (VRG), whose primary objective is to identify and resolve any licensing, inspection, or regulatory challenges or gaps that could affect the schedule for completion of Vogtle Units 3 & 4. The VRG Charter identifies the steps the NRC is taking (including reviewing inspection results, assessing construction activities, reviewing system tests, and completing the transition to operations activities) to ensure that the regulatory requirements in the combined licenses (COLs) will be met. The NRC is implementing an integrated project plan that overlays key NRC activities on the licensee's construction and startup schedule. The VRG ensures management attention to the timely implementation of the integrated project plan.

The NRC's Region II coordinates, plans, schedules, and implements the construction inspections in coordination with the licensee's construction schedules to verify compliance with the agency's regulations and to ensure that the new plants are built in accordance with their COLs.

Highlights of the NRC licensing and oversight of construction activities at Vogtle Units 3 & 4 include: (1) the NRC has provided timely review of all license amendment requests for Vogtle Units 3 & 4 such that the construction schedule was not impacted; (2) to date, all construction inspection findings for Vogtle Units 3 & 4 are of low safety significance and the licensee has been appropriately addressing these issues; and (3) the staff is actively preparing for the transition to operations. The NRC issued the memorandum, "Transition to Reactor Oversight Process for Vogtle Electric Generating Plant, Units 3 & 4," which provides the plan to transition Vogtle Units 3 & 4 from the Construction Reactor Oversight Process to the Reactor Oversight Process (ADAMS Accession No. ML20191A383).

The licensee expects the Unit 3 and Unit 4 initial fuel loading dates to be in April 2021 and February 2022, respectively.

### **Mandatory Hearings Conducted by the Commission (OCAA)**

The Commission itself conducts mandatory hearings on applications for combined licenses (COLs) and construction permits for medical isotope production and utilization facilities, as set forth in Chapter IV of the Internal Commission Procedures. The Commission may also decide to conduct other types of mandatory hearings in individual cases (e.g., on an early site permit application).

Over the past decade, eight combined license (COL) proceedings have been completed, resulting in issuance of the Vogtle, Summer, Fermi, South Texas, Levy County, William States Lee III, North Anna, and Turkey Point COLs. Each of these proceedings involved a mandatory hearing conducted by the Commission itself. There is currently one COL application under review by the staff for the Oklo Aurora compact fast reactor. Should the staff complete this review, the Commission would conduct a mandatory hearing prior to a final decision on the application. In addition, the Commission held mandatory hearings for two applications for medical radioisotope production facilities, resulting in the issuance of construction permits to SHINE Medical Technologies, Inc. in 2016 and Northwest Medical Isotopes, LLC in 2018. In 2019, the Commission conducted the mandatory hearing associated with the application for the first early site permit application involving two or more small modular reactors (the application for an early site permit for the Clinch River site).

**Procedures for Hearings on Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) (OGC)**

Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) are included in the 10 CFR Part 52 combined license and design certification rules to verify that the facility has been properly constructed and is ready to be safely operated. Before operation, the NRC must find that the ITAAC are met, and the Atomic Energy Act (AEA) provides a hearing opportunity on this finding. The AEA also imposes specific requirements for this hearing process, including: (1) hearing requests must satisfy a strict standard, (2) the hearing must be conducted expeditiously, (3) the Commission has the discretion to use formal or informal procedures, and (4) interim operation is allowed while the hearing is ongoing if certain standards are satisfied. In response to Commission direction, OGC, OCAA, and the NRC staff developed detailed procedures for ITAAC hearings that were published for comment in April 2014. The draft final procedures were transmitted to the Commission for its approval in SECY-15-0010. The final ITAAC hearing procedures were published in the *Federal Register* in July 2016.

## **Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) (NRR)**

A combined license (COL) enables the licensee to construct and operate a plant once construction is complete if certain identified standards are satisfied. These standards, or inspections, tests, analyses, and acceptance (ITAAC), are necessary and sufficient, when successfully completed by the licensee, to provide reasonable assurance that the facility has been constructed and will operate in conformity with the COL, the Atomic Energy Act of 1954, as amended, and the Commission's rules and regulations. As required by 10 CFR 52.99, licensees must notify the NRC that the prescribed inspections, tests, and analyses have been performed and that the prescribed acceptance criteria are met for each ITAAC included in its COL. This notification is referred to as an ITAAC Closure Notification (ICN). The NRC reviews each ICN to verify that each contains sufficient information for the reader to conclude that the licensee has successfully completed the ITAAC. Until the last date for submission of hearing requests under 10 CFR 52.103(a), the NRC publishes notices in the *Federal Register* of the staff's determination of the successful completion of inspections, tests, and analyses, pursuant to 10 CFR 52.99(e). The publication of the ITAAC notifications and the staff's determinations of successful completion in the *Federal Register*, supports the hearing process associated with the 10 CFR 52.103(g) finding.

### **Vogtle 3 and 4 ITAACs**

Each COL issued for the AP1000 design contained approximately 875 ITAACs that licensees are required to complete during construction, before authorization to operate. License amendments have been approved for the Vogtle units that consolidated or removed duplicative ITAACs. Currently, there are fewer than 400 ITAACs for Units Vogtle 3 and 4. The status of notifications on ITAAC for Vogtle Units 3 and 4 is publicly available on the NRC's website, <https://www.nrc.gov/reactors/new-reactors/oversight/itaac.html>.

To date, Southern Nuclear Company (SNC) has submitted approximately 257 ITAAC ICNs in accordance with 10 CFR 52.99(c)(1) for Vogtle Units 3 and 4. The NRC staff has the processes and resources in place to review ICNs as they are submitted by the licensees. In addition, the NRC reviews uncompleted ITAAC Notifications (UINs) submitted earlier than the requirements of 10 CFR 52.99(c)(3), consistent with the staff's verification reviews of ICNs. Potential benefits of reviewing early UINs include:

- reducing NRC staff workload later in construction;
- mitigating the "ICN surge", which is the increased receipt of ICNs as most ITAAC will be completed towards the end of construction, by more evenly distributing workload;
- allowing earlier identification of issues related to ITAAC completion methodology or sufficiency of information that would be required in subsequent ICN submittals; and
- providing earlier availability of information for public stakeholders.

### **Vogtle 3 and 4 Next Steps**

The NRC staff continues to have internal and external engagement regarding submitted ICNs and the schedule for future ICN submittals. This will ensure staff understanding and availability of adequate resources to review the ICNs and support a determination regarding the 10 CFR 52.013(g) finding. Currently, the licensee expects that all the ICNs will be submitted by approximately March 2021 to support an expected Unit 3 initial fuel loading date in April 2021. The Unit 4 initial fuel loading date is expected in February 2022.

## **Bellefonte – License Transfer Dispute Between TVA and Nuclear Development (NRR)**

### **Background**

The Bellefonte Nuclear Plant (Bellefonte) site is owned by the Tennessee Valley Authority (TVA) and is located in Hollywood, Alabama. In December 1974, the NRC issued two construction permits to TVA for the construction of Bellefonte Units 1 and 2, two pressurized water reactors (PWRs) of Babcock & Wilcox design.

TVA began the construction of Bellefonte Units 1 and 2 in January 1975. By 1988, when TVA's Board of Directors decided to suspend the project, Bellefonte Unit 1 construction was around 85% complete and Unit 2 construction was around 60% complete. In December 2005, TVA notified the NRC that it was placing the construction permits in terminated status under the Commission Policy Statement on Deferred Plants (52 FR 38077; October 14, 1987) (ADAMS Accession No. ML060120054). In April 2006, TVA requested that the NRC withdraw the construction permits for the Bellefonte site (ADAMS Accession No. ML061000538). In September 2006, the NRC granted TVA's request, indicating that the staff considered the construction permits to be terminated (ADAMS Accession No. ML061810505).

In August 2008, TVA asked the NRC to reinstate the construction permits for Bellefonte Units 1 and 2 (ADAMS Accession No. ML082410087). The NRC granted TVA's request in February 2009, and in January 2010 changed the status of construction permits to a "deferred status" (ADAMS Accession Nos. ML090490838 and ML093420915). The construction permits for Bellefonte Units 1 and 2 are currently in deferred status under the Commission Policy Statement on Deferred Plants.

### **Sale of Bellefonte**

In 2015, TVA's Board of Directors determined that it would be unlikely to need a large plant such as Bellefonte for the next 20 years. As such, in October 2016, TVA declared the Bellefonte plant to be surplus property and placed the Bellefonte site up for sale at auction. On November 14, 2016, Nuclear Development, LLC (ND), won the auction and signed a purchase agreement with TVA for \$111 million. Under the purchase agreement, the parties were given two years to satisfy closing conditions. The closing date was set for November 14, 2018, and later extended to November 30, 2018. As noted below, ND submitted a license transfer application to the NRC for the construction permits on November 13, 2018 (ADAMS Accession No. ML18318A428). Submission of the request on this date left the staff insufficient time to complete its review of the application by the scheduled closing date of November 30, 2018 (reactor license transfer reviews typically take at least six months).

### **Ongoing Legal Dispute Between ND and TVA**

On November 30, 2018, ND filed a complaint against TVA in the U.S. District Court for the Northern District of Alabama for breach of contract for refusing to transfer the property in accordance with the purchase agreement. In response, TVA stated, among other things, that it could not close on the sale of the Bellefonte site because the sale would have been illegal under the Atomic Energy Act of 1954 (AEA) and associated regulations because, according to TVA, the AEA and its regulations prohibit TVA from selling or transferring the Bellefonte site or construction permits without NRC prior approval.

The trial date was initially set for May 2020; however, due to COVID-19 it was rescheduled to August 2020, and again to November 2020.

### **ND's Application to Transfer Bellefonte's Construction Permits**

On November 13, 2018, ND submitted an application to the NRC requesting that the NRC transfer the construction permits for Bellefonte Units 1 and 2 from TVA to ND. In the application, ND also requested an extension for the construction completion dates for both units. In a response letter to ND dated April 5, 2019 (ADAMS Accession No. ML18348B139), the NRC staff informed ND that its application was incomplete, and ND needed to provide supplemental information to enable the staff complete its acceptance review. The staff requested that ND provide supplemental information to demonstrate that ND is technically and financially qualified to own the Bellefonte site and has a quality assurance plan that meets the NRC's regulatory requirements. Noting that the application was not submitted jointly with the current licensee, TVA, the staff also requested, in accordance with 10 CFR 50.80(b)(2), that ND provide information regarding ND's right to possess the Bellefonte site in the form of written consent from TVA or a court order or judgment.

In August 2019, ND supplemented its application and provided the technical information that the staff had requested (ADAMS Accession No. ML19240A382). In its supplement, ND also acknowledged that the NRC may not consent to the transfer of the construction permits prior to demonstration of ND's right to possession of the site and requested that the NRC accept the application and proceed with the other portions of its review pending resolution of the court case. In November 2019, the NRC staff completed its acceptance review of ND's application and its supplemental information, and informed ND that its application had been accepted and docketed for detailed review (ADAMS Accession No. ML19298A194). The staff informed ND that the detailed review would be completed by September 2020.

### **Current Status of ND's Application Review**

On August 31, 2020, the NRC staff sent ND a status letter indicating that the staff is unable to complete its review of the application until ND provides the information requested to demonstrate compliance with 10 CFR 50.80(b)(2) (written consent from TVA or a court order). On September 11, 2020, ND provided a supplement to its application proposing that issuance of the NRC's order granting consent to the transfer of the Bellefonte construction permits could be conditioned upon ND submitting proof of its right to possess the facility at least 5 business days prior to closing of the transfers.

The staff reviewed ND's supplemental information and concluded that it did not address staff's concerns with respect to ND's right to possess the site. Additionally, the staff noted that historical license transfer examples that ND had cited in its September 11<sup>th</sup> letter as precedence and a path forward for the staff to approve ND's application by imposing a license condition were not applicable to the transfer of Bellefonte CPs from TVA to ND because the current owner of Bellefonte (TVA) is not consenting to the sale and transfer of the site to ND. On October 27, 2020, the staff held a conference call with ND, and followed up with a formal letter, to inform ND of the staff's conclusion and response to ND's September 11<sup>th</sup> letter. During the conference call the staff reiterated that it cannot approve the licensing actions requested in ND application until ND demonstrates that it has the right to possess the facility.

## **Fukushima Lessons Learned (NRR)**

The agency responded immediately following the accident at the Fukushima Dai-ichi nuclear facility in Japan as part of the U.S. efforts to protect our citizens and assist the government of Japan. Shortly after the accident, the NRC created the Near-Term Task Force (NTTF) to evaluate lessons learned and identify recommended actions to improve the safety of U.S. nuclear power plants. The NRC created a Steering Committee to establish the structure, scope, and expectations for the agency's assessment and implementation of the recommendations. The Steering Committee evaluated the NTTF's recommendations, along with additional recommendations identified by other sources, and prioritized activities into three tiers, with Tier 1 activities being the highest priority. Three orders were issued to licensees for Tier 1 recommendations. These orders required the development of mitigating strategies for beyond design basis external events, installation of reliable spent fuel pool level instrumentation, and installation of reliable, severe-accident-capable hardened containment vents for boiling water reactors with Mark I and II containments. The NRC also issued a Tier 1 information request to licensees to assess protection from seismic and flooding hazards at their plants through walkdowns, re-evaluate seismic and flooding hazards using present-day information and techniques, and evaluate certain emergency preparedness items.

All of the Fukushima lessons-learned safety initiatives are on or ahead of established schedules, and the majority of the safety benefits from these initiatives were in place by the end of calendar year 2016. All sites have declared compliance with the mitigation strategies, spent fuel pool instrumentation, and hardened vents orders. NRC inspections confirming compliance are complete for the mitigation strategies and spent fuel pool instrumentation orders. All but one of the inspections for the hardened vent order are expected to be completed by December 31, 2020. The remaining inspection was rescheduled from May 2020 to calendar year 2021 due to impacts from the COVID-19 public health emergency. All sites have provided the information requested for hazard re-evaluation, emergency preparedness, staffing assessments, and communication plans. The staff has completed its evaluation of all of the information submittals. In SRM-SECY-16-0142, the Commission approved a final rule to amend portions Parts 50 and 52 of Title 10 of the Code of Federal Regulations to address the mitigation of beyond-design-basis events. This rule was effective as of September 9, 2019. Accordingly, the staff has now dispositioned all Tier 2 and 3 activities in accordance with the Commission's guidance.

The NRC routinely interacts with external stakeholders, including the public, industry, other governmental organizations, and the international community to improve effectiveness and efficiency of lessons learned activities. These activities are largely consistent with those taken by the international community and are being implemented within a similar timeframe. For example, NRC and the Department of Energy are collaborating with nuclear authorities in ten other countries in the Nuclear Energy Agency Benchmark Study of the Accident at the Fukushima Daiichi Nuclear Power Station and the Senior Expert Group on Safety Research Opportunities Post-Fukushima. These efforts will identify opportunities to gain additional nuclear safety insights from Fukushima Daiichi, during decommissioning.

## **Crediting FLEX in Regulatory Actions (NRR)**

### **Introduction**

The term “FLEX” refers to the diverse and flexible coping strategies for beyond-design-basis external events that were established in response to the Fukushima Dai-ichi accident in 2011. The NRC and many licensees are modifying their probabilistic risk assessment (PRA) models to incorporate the implementation of FLEX.

Some licensees have requested risk-informed license amendments that rely on PRA models which have incorporated FLEX strategies. Other licensees have requested non-risk-informed licensing actions that include the expanded use of FLEX beyond its initial purpose, such as to provide additional diesel generator redundancy when requesting an extended emergency diesel generator outage time. When appropriate, the NRC has and will continue to provide credit for FLEX in both licensing and oversight applications. The NRC’s Standardized Plant Analysis Risk (SPAR) models, which the NRC uses to assess the risk significance of inspection findings as part of the Significance Determination Process and to provide risk insights for licensing reviews, have been updated with FLEX strategies.

The staff’s goal is to provide a more consistent and predictable approach to crediting FLEX in regulatory applications. Three of the ongoing challenges regarding crediting FLEX in PRA models are:

1. Establishing equipment reliability data for FLEX equipment
2. Developing human reliability analysis (HRA) methods for challenging FLEX actions
3. Engaging with the industry.

NRC’s and industry’s actions addressing those challenges are discussed below.

### **Establishing Equipment Reliability Data**

The NRC staff is coordinating with the Pressurized Water Reactor Owner’s Group (PWROG) which is collecting and analyzing FLEX equipment reliability data. The PWROG issued a draft report, PWROG-18043-P, Revision 0, “FLEX Equipment Data Collection and Analysis,” documenting the equipment failure probability data analysis methods and results. The NRC and Idaho National Lab staff conducted a remote audit of the PWROG’s report, associated data, and statistical techniques. The NRC documented several observations about the data collection and analysis process in an audit report issued June 10, 2020 (ADAMS Accession No. ML20155K827). The PWROG plans to review the NRC’s comments and will consider updating the data collection and analysis process before issuing their final report. The final PWROG report will then be used to establish consistent treatment of FLEX equipment reliability in PRA models. Additionally, the NRC’s goal is to make the FLEX equipment failure probabilities publicly available, consistent with the Commission’s PRA Policy Statement (60 FR 42622): “PRA evaluations in support of regulatory decisions should be as realistic as practicable and appropriate supporting data should be publicly available for review.”

### **Developing Human Reliability Analysis Methods**

The Electric Power Research Institute (EPRI) and the NRC identified gaps in the ability of existing HRA methods to quantify the human error probabilities (HEPs) associated with certain

unique human actions related to FLEX implementation, such as the transportation, placement, connection, and local control of portable equipment. To close these gaps, the NRC developed a tool called the Integrated Human Event Analysis System for Events and Conditions Assessment (IDHEAS-ECA) HRA method (ML20016A480). This quantification tool is designed to address a broad set of scenarios, especially those that involve operator actions taken outside the main control room and in the context of beyond-design-basis external events.

The NRC joined the EPRI under a memorandum of understanding with the Office of Nuclear Regulatory Research (RES) to evaluate the ability of IDHEAS-ECA to quantify HEPs associated with various FLEX scenarios. In 2019, a team consisting of HRA experts and FLEX experts from both the NRC and industry visited a boiling water reactor and a pressurized water reactor to define a set of realistic FLEX scenarios that would be evaluated using IDHEAS-ECA. The IDHEAS-ECA evaluation effort also addressed two non-FLEX scenarios (i.e., the initiating event is not an external event) that were of interest to industry. The HRA experts participated in a workshop in December 2019 to share their experience using IDHEAS-ECA to quantify HEPs associated with the defined FLEX and non-FLEX scenarios. The evaluation team found that IDHEAS-ECA was easy to use and generated reasonable results. The evaluation report was made publicly available on September 1, 2020 (ADAMS Accession No. ML20245E456) and was discussed with the Advisory Committee on Reactor Safeguards during a meeting in September 2020.

### **Engaging the Industry**

To support the staff's goal of establishing predictability in the crediting of FLEX, the staff has engaged in a number of public interactions with industry representatives to discuss the ongoing challenges and other issues. In addition, the NRC coordinated with the Nuclear Energy Institute and EPRI to hold a FLEX Summit to discuss the expanded use of FLEX to enhance safety at nuclear power plants and to resolve these remaining issues.

A five-day virtual FLEX Summit, composed of NRC staff, industry representatives, and external stakeholders, was held during the first two weeks of September 2020. The purpose of the summit was to reach a common understanding on various FLEX-related topics, including the proper implementation of FLEX through the application of operating experience and knowledge management, and achieving FLEX realism to support NRC licensing and oversight actions. Discussion topics were set up with a goal to provide senior management with recommendations to resolve any issues related to crediting and expanding the use of FLEX. In cases where a common understanding was not achieved, action items were developed to help facilitate issue resolution through appropriate regulatory channels.

## **Management of Spent Fuel (RES)**

The NRC is confident in the safety of the storage of spent fuels whether stored in pools or stored in dry cask storage systems. This confidence is based on the history of NRC oversight of spent fuel storage, spent fuel pool (SFP) operating experience (domestic and international), and past studies of SFP safety, all of which have shown that the current approaches to storage of spent fuel maintain safety.

The accident at the Fukushima Dai-ichi nuclear facility in Japan led to questions about the safe storage of spent fuel and whether the NRC should require expedited transfer of spent fuel to dry cask storage at U.S. nuclear power plants. To help inform the broader analysis of this issue as part of the Japan Lessons-learned Tier 3 plan, the NRC completed a study of potential consequences of a beyond-design-basis earthquake affecting the spent fuel pool for a U.S. Mark I Boiling Water Reactor (NUREG-2161). The purpose of this study was to provide additional information to help determine if accelerated transfer of spent fuel from spent fuel pools to dry cask storage significantly reduces risks to public health and safety.

To determine whether regulatory action to require expedited transfer of spent fuel to dry cask storage might be warranted, the NRC followed a decision-making process called a regulatory analysis. The staff assessed the potential safety benefits by using the Commission's 1986 Safety Goal Policy Statement. Then, the staff considered various factors, including possible benefits and possible costs, which is a standard part of this analysis.

The NRC staff provided the results of its regulatory analysis to the Commission in COMSECY-13-0030 (ADAMS Accession No. ML13329A918) in November 2013 using insights from NUREG-2161 and past studies. In its assessment, the staff concluded that the expedited transfer of spent fuel to dry cask storage would provide only a minor or limited safety benefit, and that, in light of the minor or limited safety benefit, the expected implementation costs would not be warranted. In reaching this conclusion, the staff interacted with a variety of stakeholders, including the NRC's Advisory Committee on Reactor Safeguards and the public. In the SRM for COMSECY-13-0030 (ADAMS Accession No. ML14143A360), dated May 23, 2014, the Commission approved the NRC staff's recommendation that regulatory action to require expedited transfer is not warranted, but directed the staff to complete some additional limited scope activities. As such, this Near-Term Task Force Tier 3 recommendation was closed.

In SECY-16-0100 (ADAMS Accession No. ML16188A296), NRC staff provided its assessment of the National Academy of Sciences (NAS) report titled "Study of the Lessons Learned from the Fukushima Nuclear Accident for Improving Safety and Security of U.S. Nuclear Power Plants—Phase 2" to the Commission. The NAS report focused on the safety and security of spent fuel storage, including reevaluating findings and recommendations from previous NAS reports. The NRC did not identify a need to initiate new activities or otherwise redirect resources to address recommendations in the NAS report. The NRC concluded that spent fuel continues to be stored safely and securely at nuclear power plants in both SFPs and dry casks, and the security of U.S. nuclear power plants remains robust. The NRC will continue to cooperate with other Federal agencies and international organizations to assess threats to nuclear power plants and to improve risk assessment techniques.

Notwithstanding the results of the assessment, spent fuel pool safety and security continues to be enhanced through additional requirements for mitigating beyond-design-basis events in

spent fuel pools, enhanced spent fuel pool instrumentation, improved emergency preparedness, and robust security requirements to detect and respond to terrorist attacks.

**Consolidated Interim Storage Facilities: Holtec (HI-STORE) and Interim Storage Partners (ISP/WCS) Consolidated Interim Storage Facility Applications (NMSS)**

The NRC has an established regulatory framework in place for the licensing and oversight of commercial spent nuclear fuel storage facilities in the U.S. Today, the NRC oversees 79 licensed independent spent fuel storage installations with more than 3200 dry storage casks, which are located across 34 States in the U.S. In recent years, the NRC has received two applications to construct and operate storage facilities to consolidate spent nuclear fuel from around the country. Prior to the receipt of these applications, the agency had issued only one license for a similar type of consolidated spent fuel storage facility, to Private Fuel Storage, LLC (PFS). The PFS facility was licensed in 2006 but was never constructed. Additional details on each of the applications and the PFS license are given below. While the two pending applications are separate and distinct, the agency is using the same review process to evaluate both applications.

With respect to scheduling and resources, the staff estimates that the safety, security, and environmental review of a current Consolidated Interim Storage Facility (CISF) application takes approximately 3 years at a total estimated cost of \$7.5M to conduct. This estimate does not include potential time and resources for an adjudicatory proceeding. When contentions are filed as part of the adjudicatory process, the extra time and cost to complete the hearing process depends on the number and complexity of proposed contentions and whether a hearing is granted. If a hearing is granted, a license cannot be issued until the adjudicatory proceeding is completed.

**Interim Storage Partners, LLC (ISP/WCS Consolidated Interim Storage Facility)**

Waste Control Specialists, LLC (WCS) submitted an application in April 2016 to construct and operate a CISF in Texas (ADAMS Accession No. ML16132A533). WCS requested a license to initially store 5,000 metric tons of uranium (MTUs) in commercial spent nuclear fuel receive from commercial nuclear power reactors for a 40-year license term. If approved, subsequent amendment requests are anticipated to expand the proposed facility over 20 years to store up to 40,000 MTUs of spent nuclear fuel. On April 18, 2017, one year into the staff's review of the application, WCS requested the NRC temporarily suspend the review of its application, pending the anticipated sale of the company (ADAMS Accession No. ML17110A206). In March 2018, WCS and Orano, an international nuclear supplier, formed Interim Storage Partners, LLC (ISP) as a joint venture to take over the CISF project.

On July 19, 2018, ISP requested that the NRC resume all safety and environmental review activities associated with the proposed WCS CISF license application (ADAMS Accession No. ML18208A437). Upon resuming the review, the agency issued a notice of opportunity to request a hearing (ADAMS Accession No. ML18235A071), consistent with the established review process and, in mid-November 2018, the NRC received four requests for an adjudicatory hearing containing approximately 39 contentions. A board of judges from the NRC's Atomic Safety and Licensing Board Panel (the Board) was appointed to review the requests and to decide whether to grant a hearing. The Board held oral argument on the hearing requests on July 10-11, 2019. On August 23, 2019, the Board ruled on all the initial hearing requests, granting only the Sierra Club's hearing request (ADAMS Accession No. ML19235A165). A single contention was admitted in part, as a contention of omission with respect to the public availability of five studies on which ISP's Environmental Report relies. On November 18, 2019, the Board dismissed the contention as moot, agreeing with ISP's motion that it had cured the

omission by providing the studies (ADAMS Accession No. ML19322C599). In the same ruling, the Board found that the Sierra Club's subsequent proposed amended contention (challenging the adequacy of the studies) was not admissible; Sierra Club's appeal of that ruling is pending before the Commission. The three other petitioners whose requests were initially denied by the Board have appealed that ruling, and those appeals are also pending before the Commission.

As part of the preparation of the environmental impact statement, in 2016 the staff provided a 243-day scoping comment period. During the scoping comment period, staff held two nationwide public webinars and two in-person public meetings in Texas and New Mexico to receive scoping comments. On May 4, 2020, the NRC staff published its draft Environmental Impact Statement for the ISP CISF for a 120-day comment period (ADAMS Accession No. ML20122A220). In response to requests associated with the COVID-19 public health emergency (PHE), the staff granted an additional extension to the comment period, bringing the total comment period to 180 days. The public comment period will close on November 3, 2020. The staff hosted four public webinars, in lieu of in-person public meetings. The NRC expects to complete the safety, security, and environmental reviews of the application in July 2021, as stated in the most recent letter to ISP revising the licensing review schedule (ADAMS Accession No. ML20282A351). This schedule does not include the time necessary to conduct an adjudicatory hearing, if a hearing request is granted.

### **Holtec International (HI-STORE Consolidated Interim Storage Facility)**

Holtec International (Holtec) submitted an application in 2017 for a CISF to be located in southeastern New Mexico. Holtec requested a 40-year license to initially store 500 canisters of commercial spent nuclear fuel (containing up to 8,680 MTUs) in the Holtec HI-STORM UMAX storage system. Although not part of the pending request, Holtec intends to expand the proposed facility over 20 years to store up to 10,000 canisters of SNF. In February 2018, NRC docketed the application and began a detailed safety, security and environmental review (ADAMS Accession No. ML18059A251).

In response to a notice of opportunity for an adjudicatory hearing, NRC received six hearing requests proposing approximately 46 contentions. On May 7, 2019, the Board issued a decision denying all the requests (ADAMS Accession No. ML19127A026); the Board's decision was appealed by all of the petitioners to the Commission. On April 23, 2020, the Commission issued an order in which it affirmed in part the Board's rulings and reversed and remanded six contentions to the Board for further review (ADAMS Accession No. ML20114E150). On June 18, 2020, the Board issued an order rejecting five of these contentions (ADAMS Accession No. ML20170A558). The petitioners have filed a second appeal of the Board's decision to the Commission. On September 3, 2020, the Board issued another order rejecting the final contention (ADAMS Accession No. ML20247J549), which has also been appealed to the Commission. One of the petitioners has appealed the Commission's April 23, 2020, decision to the U.S. Court of Appeals for the D.C. Circuit. The NRC moved to hold the case in abeyance given the ongoing proceedings and is awaiting a decision on that request.

As part of the preparation of the environmental impact statement, in 2018 the staff provided a 120-day scoping comment period. During the comment period, the staff held one nationwide public webinar and five in-person public meetings in New Mexico to receive scoping comments. On March 9, 2020, the NRC staff published its draft environmental impact statement for the Holtec HI-STORE CISF (ADAMS Accession No. ML20069G420) and began a 60-day comment period. In response to requests associated with the COVID-19 PHE, the staff granted additional extensions to the comment period, bringing the total comment period to 180 days, and hosted

six public webinars, in lieu of in-person public meetings in New Mexico. The public comment period closed on September 22, 2020.

The NRC expects to complete the safety, security, and environmental reviews of the application in July 2021, as stated in the most recent letter to Holtec revising the licensing review schedule (ADAMS Accession No. ML20267A102). This schedule does not include the time necessary to conduct an adjudicatory hearing, if a hearing is granted.

### **Private Fuel Storage, LLC (PFS)**

In 2006, the NRC licensed the Private Fuel Storage facility, a specifically licensed independent spent fuel storage installation (ISFSI) that preceded the current CISF applications. The PFS facility was intended to serve as a consolidated facility for spent fuel. The facility was planned to be constructed in Tooele County, Utah, and operated by a consortium of nuclear utilities. The staff's review of safety, environmental, and security issues related to the PFS ISFSI application took approximately nine years, including a seven-year adjudicatory hearing. The adjudicatory hearing overlapped with the staff's safety and environmental review. The cost of the PFS review, including completion of the adjudicatory process, was approximately \$9M, which included 35 FTE. PFS did not construct the facility because it could not obtain other necessary permits from the Bureau of Land Management and Bureau of Indian Affairs.

## **DOE's Interpretation of High-Level Waste (HLW) Definition (NMSS)**

On June 10, 2019, the Department of Energy (DOE) published a final version (Supplemental Notice) of its interpretation of the definition of high-level waste (HLW) in the Atomic Energy Act of 1954, as amended, and the Nuclear Waste Policy Act of 1982, as amended. (84 FR 26835) The *Federal Register* notice addresses the range of comments received on the draft version published on October 10, 2018, including the NRC staff's comments. DOE revised its criteria for determining non-HLW consistent with the NRC staff's comments.

DOE interprets the definition of HLW to provide that reprocessing waste may be determined to be non-HLW if the waste meets either of the following two criteria:

1. does not exceed concentration limits for Class C low-level radioactive waste as set out in section 61.55 of title 10, Code of Federal Regulations, and meets the performance objectives of a disposal facility; or
2. does not require disposal in a deep geologic repository and meets the performance objectives of a disposal facility as demonstrated through a performance assessment conducted in accordance with applicable requirements.

The new interpretation does not include one of the primary criteria that has played a central role in DOE's historical waste determinations and is statutorily mandated by Sec. 3116 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005— specifically, the criterion that requires removal of key radionuclides to the “maximum extent practical.”

The NRC staff noted in comments on DOE's draft Notice that this previously used criteria was most applicable for in-situ disposal of waste, and agreed that, for waste being packaged and transported to off-site disposal facilities designed to receive such waste, application of this criteria may not result in increased benefits to human health or the environment. In acknowledging NRC staff's comments, DOE's Supplemental Notice indicates that the HLW interpretation does not impact DOE's intent and obligation to comply fully with Sec. 3116, which applies to two “covered States”—South Carolina and Idaho. However, DOE states that Sec. 3116 does not preclude transporting reprocessing wastes out of South Carolina or Idaho to be disposed of in a disposal facility in a different state and thus, is outside the scope of Sec. 3116.

DOE's Supplemental Notice indicates that the Notice does not propose any changes or revisions to current policies, legal requirements, or agreements with respect to HLW; and that whether and how this interpretation of HLW will apply to existing wastes will be the subject of subsequent DOE actions. The Notice also recognizes the NRC's role and authority in the area of HLW and indicates that it plans to continue to involve the NRC in determinations for specific waste.

One limitation relevant to DOE's interpretation is that Sec. 3121 of the National Defense Authorization Act for Fiscal Year 2020 (Pub. L. 116-92, enacted December 20, 2019) prohibits DOE from using funds authorized to be appropriated by the Act or otherwise made available for DOE for fiscal year 2020, to apply its interpretation of HLW to waste located in the State of Washington. In particular, this provision prevents DOE from applying this definition to waste at the Hanford Site, the former plutonium-production complex in Benton County, Washington.

## **Uranium Recovery (NMSS)**

### **Licensed Facilities**

There are three uranium recovery facilities that are licensed to operate by the NRC. These facilities are all in-situ recovery (ISR) facilities, meaning the uranium is recovered by injecting an oxygen-bicarbonate solution into the uranium-rich sandstone rock formation (ore) to dissolve the uranium and pumping the uranium solution to the surface. One of these facilities, Crow Butte Resources, Inc.'s (CBR's) Crow Butte Project (Nebraska) is in a standby status and is focusing its efforts on groundwater restoration. Powertech (USA) Inc.'s (Powertech's) Dewey-Burdock Project (South Dakota) is currently awaiting issuance of an Underground Injection Control (UIC) permit from EPA, and NuFuels Inc.'s Crownpoint Uranium Project (New Mexico) is in pre-construction status. Region IV has verified that the status of the two licensees in pre-construction status has not changed annually as part of their inspection planning efforts.

Conventional milling is another method of extracting uranium from ore (rock). A conventional mill receives uranium ore from hard-rock mining (milling is regulated by the NRC, mining is not) and crushes, grinds, and processes the mined ore to make "yellowcake." The leftover or waste material after processing is called tailings and is disposed of in large landfill-like facilities. Currently, there are not any conventional uranium mills licensed to operate by the NRC. The Office of Nuclear Material Safety and Safeguards is responsible for licensing uranium recovery facilities. The NRC Region IV Office is responsible for inspecting all uranium recovery licensed facilities, generally once or twice per year with headquarters staff assistance.

### **Licensing Actions**

There are no major licensing actions undergoing staff review. Two major licensing actions are on hold at the applicant's request: CBR's North Trend (license amendment for expansion, Nebraska) and NuFuels (formerly Hydro Resources Inc.) Crownpoint (license renewal, New Mexico). In addition, the NRC staff routinely reviews smaller licensing actions, such as changes to financial sureties.

### **Atomic and Safety Licensing Board (ASLB) Hearings**

There are three uranium recovery licensing actions that are currently involved in hearings before the Atomic Safety and Licensing Board or appeals before the Commission: Powertech's Dewey-Burdock (South Dakota), CBR's license renewal (Nebraska), and CBR's North Trend Expansion (Nebraska). The parties are awaiting Commission decisions in the Powertech proceeding and the CBR license renewal proceeding. In the North Trend proceeding, a hearing request was granted but the hearing has not yet been held because the staff's review of the application remains suspended at the applicant's request.

### **Rulemaking**

Current NRC uranium recovery regulations are geared towards conventional mill tailings facilities. In the SRM-COMJSM-06-0001, "Regulation of Groundwater Protection at *In Situ* Leach Uranium Extraction Facilities," dated March 23, 2006 (ADAMS Accession No. ML060820503), the Commission approved the initiation of a rulemaking for the purpose of providing clarity, predictability, and consistency to the licensing and regulation of ISR facilities. The NRC staff began developing an ISR-specific rulemaking in 2006 but deferred this

rulemaking in 2010 after EPA notified the NRC staff that it would undertake their own rulemaking for ISR facilities. Under Section 275 of the Atomic Energy Act, as amended (AEA), the EPA is charged with establishing generally applicable standards for protecting public health and safety and the environment against radiological and non-radiological hazards associated with the processing and with the possession, transfer, and disposal of section 11e. (2) byproduct material, including in-situ recovery activities. The NRC or the Agreement State, as appropriate, implements and enforces these generally applicable standards. The NRC or the Agreement State is the regulatory authority over these facilities.

The EPA published two proposed rules, the first on January 26, 2015 (80 FR 4156), and a second superseding proposed rule on January 19, 2017 (82 FR 7400). The NRC staff had significant jurisdictional and technical concerns with both proposed rules. The NRC staff submitted its comments on the second proposed rule to EPA on July 18, 2017. The NRC staff's comments are publicly available on [www.regulations.gov](http://www.regulations.gov) and in ADAMS (ADAMS Accession No. ML17173A638). In addition, on December 14, 2017, Senator Barrasso wrote to the EPA Administrator and requested that EPA withdraw its rulemaking and sign a Memorandum of Understanding (MOU) with the Commission clarifying EPA's authority to set generally applicable standards and NRC's authority to implement the standards. The EPA subsequently withdrew its rulemaking on October 30, 2018 (83 FR 54543).

The NRC staff recently completed an MOU with EPA regarding future rulemaking activities by either agency related to uranium ISR facilities, as requested by Senator Barrasso. The MOU was approved by the Commission on July 8, 2020 (SRM-COMSECY 20-0012). The MOU was signed by the Chairman on July 13, 2020 and Administrator Wheeler on July 23, 2020.

On January 31, 2019, the NRC issued a Federal Register notice (84 FR 574) requesting stakeholder input on whether the NRC should restart its 2006 ISR-specific rulemaking that had been held in abeyance since 2010. The comment period was extended and ended on May 7, 2019. Most stakeholders supported the NRC proceeding with the rulemaking. On December 16, 2019, the staff submitted SECY-19-0123, "Regulatory Options for Uranium *In Situ* Recovery Facilities," which recommended restarting the ISR-specific rulemaking. The staff is awaiting direction from the Commission regarding this rulemaking.

### **Agreement States**

In accordance with AEA section 274, the Commission may discontinue and relinquish its regulatory authority for certain categories of radioactive material to an individual State (upon signing a section 274 agreement with the Commission, the State becomes an "Agreement State"). Presently, there are several Agreement States with regulatory authority over source material licensing, including uranium milling activities that generate AEA section 11e.(2) byproduct material. Texas and Wyoming currently have active uranium recovery programs. The NRC staff reviews the Agreement State uranium recovery programs during Integrated Materials Performance Evaluation Program periodic reviews. The NRC staff also collaborates with Agreement States on guidance revisions and improvements with licensing.

### **Decommissioning**

The staff's current regulatory priority in the uranium recovery area is the oversight of decommissioning activities at uranium recovery sites. The Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA) created two types of uranium mill sites: "Title I," for sites that were closed before 1978, where the Department of Energy (DOE) is responsible for remediation

and long-term care under an NRC general license; and “Title II” for AEA section 11e.(2) sites licensed by NRC or an Agreement State after 1978, for which the United States government, typically DOE or the Agreement State, at its option, is responsible for long-term care under an NRC general license, but only after private licensees complete remediation. So far, all Title II sites that have been decommissioned have been transferred to DOE for long-term care. No Agreement State has exercised the option to have any Title II site transferred to it.

There are 22 Title I sites, 4 of which are on the Navajo Nation. Additionally, there are 6 Title II sites that have completed remediation and were subsequently transferred to DOE, and there are 20 Title II sites currently undergoing remediation with anticipated future transfer to DOE for long-term surveillance and maintenance. Fifteen of these Title II sites are under Agreement State jurisdictions and 5 are under NRC jurisdiction. For one of the Title II sites under NRC jurisdiction—the American Nuclear Corporation (ANC) site in Gas Hills, Wyoming—the NRC staff is currently working with the DOE and the State of Wyoming, Department of Environmental Quality to propose adding the ANC site to Title I of UMTRCA.

For Title II sites, when an NRC licensee completes decommissioning, the NRC reviews the licensee’s Construction Completion Report, sets the long-term care fee (LTCF) that the licensee pays to the Federal government for the perpetual care of the site, and reviews and accepts the DOE’s long-term surveillance plan (LTSP), which describes DOE’s long-term care activities at the site. At this point, the general license becomes effective and the site transfers to the DOE (or the Agreement State). When an Agreement State licensee has completed decommissioning, the NRC reviews the Agreement State’s Completion Review Report and, if the NRC agrees that the site has been adequately decommissioned, the NRC concurs on the Agreement State’s determination that the site has been adequately decommissioned. The LTCF is then established, and the NRC reviews and accepts the DOE’s LTSP for the site. Then the general license becomes effective and the site transfers to the DOE (or the Agreement State).

Primary activities at UMTRCA sites are groundwater monitoring and remediation, maintenance of covers, and revisions of long term surveillance plans. NRC, DOE, EPA, and other state and Federal agencies have been working on jurisdictional and other issues associated with such sites (the Bluewater site, for example, is located near a Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) National Priorities List site). The NRC continues its oversight of DOE’s remedial actions related to relocation of the material from the disposal cell in Moab, Utah, to a new disposal cell located in Crescent Junction, Utah.

In October 2007, the House Committee on Oversight and Government Reform requested Federal agencies create a 5-Year Plan, in consultation with the Navajo Nation, to address uranium contamination on the Navajo Nation. Participating Federal agencies include, the EPA, the Bureau of Indian Affairs, the NRC, DOE, Health and Human Services, the Indian Health Service, and Agency for Toxic Substances and Disease Registry. Currently, the staff is working with the agencies on the next plan, which will be a 10-year plan to adequately address the complexity and scope of the activities as well as the time to implement many of the objectives. One of the objectives of the plan is the cleanup of mine waste from the Northeast Church Rock (NECR) Mine Site. While the NRC does not have jurisdiction over mine waste, staff is reviewing a license amendment request to bring one million cubic yards of mine waste from the NECR mine site to the United Nuclear Corporation (UNC) Mill Site, which is under NRC jurisdiction. As part of this review, the staff is consulting with the Navajo Nation and working with the EPA, DOE, and State of New Mexico.

### **Agreement State Program (NMSS)**

The NRC enters into Agreements with States that want to establish a program to assume regulatory authority under the [Atomic Energy Act of 1954](#), as amended (the Act). Section 274 of the Act provides a statutory basis under which NRC relinquishes to the States portions of its regulatory authority to license and regulate byproduct materials (radioisotopes); source materials (uranium and thorium); and certain limited quantities of special nuclear materials. The mechanism for the transfer of NRC's authority to a State is an agreement signed by the Governor of the State and the Chairman of the NRC, in accordance with section 274b of the Act.

The NRC provides program assistance to Agreement States such as, conducting training courses and workshops; evaluating State rule changes; participating in activities conducted by the Organization of Agreement States and Conference of Radiation Control Program Directors, Inc.; and facilitating early and substantive involvement of the Agreement States in NRC rulemaking and other regulatory efforts that could impact Agreement State programs. The NRC also coordinates with Agreement States on the reporting of event information and responses to allegations reported to the NRC involving Agreement State programs. The NRC provides oversight of the State's program through the Integrated Materials Performance Evaluation Program. This program evaluates whether the State provides for the protection of public health and safety and whether it maintains a program that is compatible with NRC requirements.

On March 26, 1962, the Commonwealth of Kentucky became the first Agreement State. In December 1964, the U.S. Atomic Energy Commission hosted the first annual joint meeting with a group of these States. Today, 39 States have entered into Agreements with the NRC, with the most recent Agreement with the State of Vermont signed on September 30, 2019.

### **Source Security and Accountability (NMSS)**

(Part 37 Implementation, including Effectiveness of the Requirements of Part 37 and Protection of High-Risk Radiological Material)

On March 19, 2013, the NRC amended its regulations to establish security requirements in 10 CFR Part 37 for risk-significant sources, also known as Category 1 and Category 2<sup>1</sup> quantities of radioactive material. With the issuance of the rule, the NRC transitioned licensees from complying with security orders issued following the terrorist acts of September 11, 2001, to complying with these generally applicable regulations. Shortly following the respective NRC and Agreement State compliance dates, the NRC rescinded the security orders affecting NRC and Agreement State licensees.

The regulation established requirements for the reasonable assurance of preventing the theft or diversion of Category 1 and Category 2 quantities of radioactive material. Specifically, Part 37 applies a multilayered approach including requirements for background checks; access controls; license verification for transfers of applicable radioactive material (to prevent attempts to obtain material using fraudulent or counterfeit licenses); security barriers; transport security; the ability to detect, assess, and respond to events; and coordination with local law enforcement agencies.

In Section 403 of the Energy and Water Development and Related Agencies Appropriations Act, 2015 (Public Law 113-235, enacted December 16, 2014), the NRC was required to evaluate the effectiveness of the new 10 CFR Part 37 regulations and to determine whether the requirements were adequate to protect “high-risk radiological material<sup>2</sup>.” The staff informed the Commission of activities related to this program review in February 2016, in SECY-16-0017 (ADAMS Accession No. ML15254A347) and provided a more detailed summary of the NRC staff program review in September 2016 (ADAMS Accession No. ML17019A411). Based on the assessment, the staff concluded that the requirements in 10 CFR Part 37 are effective in ensuring the security of risk-significant radioactive materials during use, storage, and transport when implemented appropriately by licensees. The NRC transmitted the report documenting the results of its program review to Congress on December 14, 2016 (ADAMS Accession No. ML16347A398).

Public Law 113-235 also included a requirement for the U.S. Government Accountability Office (GAO) to review NRC's security requirements for high-risk radioactive material. On April 4, 2019, the GAO issued GAO-19-468, “Combatting Nuclear Terrorism: NRC Needs to Take Additional Actions to Ensure the Security of High Risk Radioactive Material.” GAO examined, among other things: 1) the extent to which radioactive security experts agreed that NRC's assessment of risk includes all relevant criteria; and 2) NRC's 2016 evaluation of its security requirements for high-risk radioactive material. The GAO recommended that NRC consider socioeconomic consequences and fatalities from evacuations as criteria for determining security measures and require additional security measures for smaller quantities (less than Category 2) of high-risk material. In its response to the GAO findings, the NRC emphasized that the basis for GAO's recommendations for further regulatory changes was not well-founded. Specifically, the NRC noted that GAO did not account for the mature and robust current protection, response, and mitigation infrastructure of the United States; did not consider all aspects of risk

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<sup>1</sup> NRC defines risk-significant quantities of radioactive material as meeting the thresholds for category 1 and category 2 as included in the International Atomic Energy Agency Code of Conduct on the Safety and Security of Radioactive Sources and in 10 CFR Part 37.

<sup>2</sup> Generally, material is referred to as “risk-significant” rather than “high-risk” to incorporate consideration of the variability of potential consequences of malicious use.

(i.e., threat, vulnerability, together with consequence); did not consider the NRC's current requirements for the safety and security of byproduct material that is less than Category 2; relied upon improbable event scenarios and upon selective aspects of a panel discussion not reflective of all panel members' views; and did not evaluate the relative benefit of their recommended changes against the costs and potential impacts to the beneficial uses of radioactive material.

In a separate effort to evaluate the protection and security of radiation sources, the Energy Policy Act of 2005 directed the establishment of the Radiation Source Protection and Security Task Force (Task Force) to address the security of radiation sources in the United States from terrorist threats. Since 2005, the Task Force, comprised of 14 Federal agencies including the NRC, which chairs the Task Force, has evaluated the sources and quantities of radioactive materials that warrant enhanced security (i.e., Category 1 and 2 quantities) based on the existing threat environment. The Task Force reports of 2006, 2010, 2014, and 2018 did not identify any significant gaps in domestic source security and recommended no legislative changes pertaining to source security. Copies of the reports can be found at <https://www.nrc.gov/security/byproduct/task-force.html>. The Task Force will provide its next report in 2022.

### **Category 3 Source Accountability**

The International Atomic Energy Agency's Code of Conduct on the Safety and Security of Radioactive Sources defines the categories for radiation sources to help ensure that sufficient controls are being used to achieve safety and security. While Category 1 and 2 sources are considered risk significant because of their potential to cause severe deterministic effects from exposure, Category 3 sources are not considered to be as risk significant. Category 3 sources are those that if not safely or securely managed, could cause permanent injury to a person who handled them or was otherwise in contact with them for hours. It could possibly—although it is unlikely to—be fatal to be close to this amount of unshielded radioactive material for a period of days to weeks. These sources are typically used in fixed industrial gauges such as level gauges, dredger gauges, conveyor gauges, spinning pipe gauges, and well-logging gauges. More information regarding well-logging may be found at <https://www.nrc.gov/reading-rm/basic-ref/glossary/well-logging.html>.

In 2014, the GAO initiated an audit of the NRC and Agreement State materials licensing program to determine whether licensing vulnerabilities identified in a 2007 GAO investigation (GAO-07-1038T) had been addressed. As part of the audit (GAO-16-330, "Nuclear Security: NRC Has Enhanced the Controls of Dangerous Radioactive Materials, but Vulnerabilities Remain"), the GAO conducted an investigation that attempted to obtain radioactive materials licenses from one NRC regional office and two separate Agreement States. The investigation sought approval of licenses authorizing the procurement of one Category 3 source using a fictitious company. The GAO was unsuccessful in two of three attempts; however, the GAO was able to acquire an Agreement State license for a Category 3 well logging source. GAO was able to secure a bid for one Category 3 source using the license, alter the license, and place an order for a second Category 3 source. The investigation demonstrated that GAO could have acquired two category 3 sources and thus, could have obtained an aggregated Category 2 quantity of material.

The NRC was notified of the GAO investigation in October 2015. Since that time, the NRC and Agreement States have taken a number of actions, one of which included forming two NRC-Agreement State working groups to evaluate vulnerabilities identified as a result of the 2015

GAO investigation. Results from the working group activities were provided to the Commission in February 2017 and were subsequently incorporated into the paper described below. In October 2016, the Commission issued SRM COMJMB-16-0001, "Proposed Staff Re-Evaluation of Category 3 Source Accountability" (ADAMS Accession No. ML16292A812). The SRM directed the staff to conduct a comprehensive analysis of Category 3 source accountability in light of the GAO's audit and the experience NRC has gained with source security. In this analysis, the staff concluded that the cost of additional regulatory requirements for Category 3 sources was not justified by the available risk, threat, or consequence information. On August 18, 2017, the NRC staff provided the results of its re-evaluation to the Commission for its consideration in SECY-17-0083, "Re-Evaluation of Category 3 Source Security and Accountability in Response to SRM-COMJMB-16-0001" (ADAMS Accession No. ML17188A249).

### **Medical Use of Byproduct Material (NMSS)**

On January 14, 2019, the NRC final rule, “Medical Use of Byproduct Material-Medical Event Definitions, Training and Experience, and Clarifying Amendments,” became effective (83 FR 33046, July 16, 2019). The final rule revised the regulations in 10 CFR Parts 30, 32, and 35 for NRC licensees, Master Materials Licensees (MML), and MML Permittees and included changes in the following eleven broad categories: Generators, Associate Radiation Safety Officer and Ophthalmic Physicist, Emerging Technologies, Notification, Manual Brachytherapy, Training and Experience, Diagnostic Medical Uses, 10 CFR 35.300 Radiopharmaceuticals, Sealed Source and Device Registry, Vendor Training, and Gamma Knife Source Exchange. The Agreement States have until January 2022 to implement compatible regulations. The final rule can be found in the *Federal Register* (<https://www.gpo.gov/fdsys/pkg/FR-2018-07-16/pdf/2018-14852.pdf>).

### **Training and Experience Requirements for Authorized Users (NMSS)**

In Staff Requirements Memorandum SRM-M170817 (ADAMS Accession No. ML17229B284), the Commission directed the NRC staff to evaluate the training and experience (T&E) requirements for authorized users (AUs) in 10 CFR Part 35, "Medical Use of Byproduct Material." In response to the SRM, the NRC staff evaluated (1) whether it makes sense to establish tailored T&E requirements for different categories of radiopharmaceuticals, (2) how those categories should be determined (such as risks posed by groups of radionuclides or delivery method), (3) what the appropriate T&E requirements would be for each category, and (4) whether those requirements should be based on hours of T&E or focused more on competency. Tailoring the T&E requirements could provide additional pathways for physicians to become AUs, addressing the concern of certain stakeholders who assert that the current T&E requirements result in a shortage of AUs.

In SECY-18-0084, "Staff Evaluation of Training and Experience Requirements for Administering Different Categories of Radiopharmaceuticals in Response to SRM-M170817" (ADAMS Accession No. ML18135A276), the NRC staff concluded that, while it may be feasible to create tailored T&E requirements, more extensive stakeholder outreach was needed. Subsequently, the staff sought additional stakeholder feedback through two public comment periods and six public meetings. On October 29, 2018, the staff published an FRN requesting specific feedback on the T&E requirements, including if the requirements should be tailored and how and whether there is a shortage of AUs associated with the use of radiopharmaceuticals, which may indicate a need to reevaluate the T&E requirements ([83 FR 54380](#)). On May 2, 2019, the staff published a second FRN providing the opportunity to comment on draft approaches to potentially revise the T&E requirements ([84 FR 18874](#)).

On January 13, 2020, the staff provided a notation vote paper to the Commission (SECY-20-0005, "Rulemaking Plan for Training and Experience Requirements for Unsealed Byproduct Material (10 CFR Part 35)" (ADAMS Accession No. ML19217A318). After consideration of the comments and varying perspectives of public stakeholders and the Advisory Committee on the Medical Uses of Isotopes (ACMUI), including information on patient access to AUs, the NRC staff recommended rulemaking in SECY-20-0005 to remove prescriptive T&E requirements and NRC approval of AUs and require AUs to be certified by a recognized medical specialty board.

### **Greater-Than-Class-C (GTCC) Radioactive Waste (NMSS)**

In its 10 CFR Part 61 regulations, "Licensing Requirements for Land Disposal of Radioactive Waste," the NRC established a national multi-tiered classification system for the land disposal of low-level radioactive waste (LLRW). The NRC classifies LLRW based upon its radiological hazard. Specifically, the NRC divides LLRW into three classes: Class A, Class B, and Class C. The gradation of these classes is based on the radiological hazard as determined by the quantity and type of radionuclides permitted in each class, as further delineated by concentrations of certain radionuclides. Therefore, Class A waste is the least hazardous and Class C waste is the most hazardous of the three categories. In addition, there are LLRW streams that have radionuclide concentrations exceeding the limits for Class C waste. These waste streams are referred to as "greater-than-Class C" (GTCC) waste.

Depending on the specific radionuclides present, most GTCC waste streams are much more hazardous than Class C waste; some GTCC waste streams also contain radionuclides that are categorized as special nuclear material, (i.e., enriched uranium or plutonium). GTCC waste may be generated by nuclear power reactors, facilities supporting the nuclear fuel cycle, and other facilities and licensees outside of the nuclear fuel cycle. GTCC waste may include: (1) transuranic radionuclides (e.g., isotopes of plutonium) that contaminate nuclear fuel cycle wastes; (2) metals activated by exposure to neutrons in nuclear reactors; (3) sealed sources; and (4) radioisotope product manufacturing wastes (i.e., wastes "occasionally generated as part of the manufacture of sealed sources, radiopharmaceutical products and other materials used for industrial, education, and medical applications").

The NRC's regulations provide defined disposal pathways for Class A, Class B, and Class C waste streams. Additionally, under the NRC's regulations, GTCC waste must be disposed of in a geologic repository unless the Commission approves, on a case-by-case basis, disposal of GTCC waste in a land disposal site. Currently there are no land disposal facilities licensed to accept GTCC waste and the current 10 CFR Part 61 regulations contain no technical criteria for such disposal. Storage, pending disposal, of reactor-related GTCC waste is addressed in Part 72, "Licensing Requirements for the Independent Storage of Spent Fuel, High-Level Radioactive Waste, and Reactor-Related Greater than Class C Waste."

The Department of Energy (DOE) was assigned responsibility for disposal of GTCC waste in the Low-Level Radioactive Waste Policy Amendments Act of 1985 (the Act). Additionally, the Act requires that GTCC waste resulting from NRC licensed activities "shall be disposed of in a facility licensed by the Commission." Section 274 of the Atomic Energy Act (AEA) provides for a mechanism for the Commission to relinquish its regulatory authority over byproduct, source, or special nuclear material (in quantities not sufficient to form a critical mass), including disposal of such material, unless the Commission finds that "because of the hazards" or "potential hazards" such material should be solely licensed by the Commission.

On January 30, 2015, the Texas Commission on Environmental Quality sent a letter to the NRC with questions concerning the State's authority to license a disposal cell for GTCC, GTCC-like (DOE owned or generated waste with GTCC characteristics), and transuranic waste. The staff conducted an analysis of Texas' authority and developed three options, along with a recommendation, that were submitted to the Commission in SECY-15-0094 (July 17, 2015). The three options are: (1) the NRC would license a disposal cell for the receipt of GTCC waste and pursue a rulemaking to address transuranic waste disposal in Part 61; (2) the State of Texas could license a cell at Waste Control Specialists for the disposal of GTCC waste and the

NRC would pursue a rulemaking to address transuranic waste disposal in Part 61; and (3) no-action. Of the three options, the staff recommended the second option (licensing by the State of Texas), based upon a broad interpretation of the Act, including its legislative history.

On December 22, 2015, the Commission directed the staff to draft a response to Texas' inquiry, prepare a regulatory basis for the disposal of GTCC waste through means other than deep geologic disposal, including near-surface disposal, within six months of the completion of the ongoing Part 61 rulemaking. Additionally, the Commission directed the staff to conduct an analysis, under AEA section 274c.(4), as to whether the disposal of GTCC waste presents a hazard such that the NRC should retain authority over its disposal, as opposed to allowing an Agreement State to license such disposal. Finally, the Commission directed the staff to hold a public workshop during the development of the regulatory basis to receive input from stakeholders to address transuranic waste in 10 CFR 61.2, the definitions section of Part 61 (SRM-SECY-15-0094 (ADAMS Accession No. ML15356A623)). On March 9, 2016, the NRC notified Texas that it began proceeding with the development of a regulatory basis. The response noted that the regulatory basis for a possible rulemaking to address the disposal requirements for GTCC waste would analyze whether, in accordance with AEA section 274c.(4), disposal of GTCC waste presents a hazard such that the NRC should retain authority over its disposal.

On February 25, 2016, DOE issued its "Final Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste." The Final Environmental Impact Statement identified the preferred alternatives for disposal as the Waste Isolation Pilot Plant geological repository and/or land disposal at generic commercial facilities. Under the Energy Policy Act of 2005, prior to making a final decision on the disposal alternatives, DOE is required to: (1) submit a report to Congress that describes the disposal alternatives and includes all of the information required in the comprehensive report DOE submitted to Congress in February 1987, and (2) await action by Congress. DOE submitted its report to Congress in November 2017.

On October 23, 2018, the Commission in the SRM for the "Briefing on Strategic Programmatic Overview of the Decommissioning and Low-Level Waste, and Spent Fuel Storage and Transportation Business Lines," provided additional directions relative to the draft regulatory basis for GTCC waste. The Commission indicated that given the long pendency of the proposed revisions to 10 CFR Part 61, the staff should decouple, to the extent practicable, the issuance of the draft regulatory basis directed in SRM-SECY-15-0094 from Commission action on 10 CFR Part 61 (ADAMS Accession No. ML18296A479). The Commission further indicated that this decoupling would allow for earlier public engagement on the staff's analysis of any potential regulatory barriers to the disposal of GTCC waste.

On July 22, 2019, the staff published a *Federal Register* notice (84 FR 35037) requesting comment on a draft regulatory basis entitled "Disposal of Greater-than-Class C (GTCC) and Transuranic Waste" (ADAMS Accession No. ML19059A172). The Commission was informed of the status of the draft regulatory basis via a Commissioners' Assistants note, dated July 31, 2019 (ADAMS Accession No. ML19196A097). The staff held a public webinar on August 22, 2019, followed by a public workshop on August 27, 2019, in Austin, Texas, to receive input from stakeholders. In response to stakeholder requests, the staff extended the comment period by an additional 60 days to November 19, 2019.

The staff received approximately 50 individual letters from members of the public, industry stakeholders, and States (NY, WA, TX, MO, and ID); and over 5,000 form letters. Some

commenters supported near-surface disposal of GTCC waste and the amendment of the 10 CFR Part 61 definition of ‘waste’ to remove the exclusion of TRU from those waste streams that are considered to be LLRW. Others supported disposal in deep geological repository (including TX DOH and ID). One commenter, Waste Control Specialists, LLC, stated that the draft regulatory basis provides sufficient detail on actions an applicant must take to ensure public and worker safety without the need for rulemaking. In addition, some commenters supported combining the GTCC and Part 61 rulemaking efforts.

Based on comments received on the draft regulatory basis, the staff is considering options for proceeding with a GTCC/TRU rulemaking and the path forward for the Part 61 Low-Level Radioactive Waste Disposal (LLRWD) rulemaking. As such, the staff is considering combining the GTCC/TRU and the LLRWD rulemaking efforts for efficiency and documented its recommendations in SECY-20-0098 – “Path Forward and Recommendations for Certain Low-Level Radioactive Waste Disposal Rulemakings” (ADAMS Accession No. ML20143A164), dated October 21, 2020. The paper includes a differing views statement questioning whether the regulatory oversight of GTCC waste can be relinquished to an Agreement State.

### **High Assay Low-Enriched Uranium (HALEU) Fuel (NMSS)**

The nuclear industry is considering the use of High Assay Low-Enriched Uranium (HALEU) for new advanced reactors, light water reactors (accident tolerant fuels), and for medical isotope production operations. HALEU is defined as uranium enriched higher than 5 weight percent but below 20 weight percent. NRC is monitoring the Department of Energy (DOE) and industry actions related to HALEU production, transportation, fuel fabrication, waste management, and disposal. DOE plans to provide HALEU until the demand and commercial sources are established.

No changes in 10 CFR Part 70, Part 71, and Part 72 regulations are expected to be required in the near term to allow industry to produce, transport, or use HALEU material and fuel. The staff is still considering whether changes to other parts of 10 CFR will be necessary.

HALEU is not commercially available today in the United States. Existing reactors typically operate on low-enriched uranium (LEU), with the uranium-235 (U-235) isotope concentration just below 5 percent. NRC is actively encouraging licensees and potential applicants that would produce, transport, or utilize HALEU to engage in pre-application discussions with NRC to allow for a more efficient and effective review of regulatory actions to support industry's schedules.

HALEU potential users are:

- Medical Isotope Production Facilities – isotopes for medical use are produced by irradiating targets.
- Light Water Reactors (LWR) – Conventional and accident tolerant fuels to achieve higher burn up
- Advanced (non-LWR) Reactors - Reactors with metal fuel with heat pipes, molten salt reactors, pebble-bed reactors

DOE plans to produce HALEU fuel for advanced reactors and research and development at the Idaho National Laboratory. This will use material recovered from the Experimental Breeder Reactor-II and spent navy fuel. DOE has contracted with American Centrifuge Operating LLC (a subsidiary of Centrus Energy Corp. (Centrus)) to produce HALEU to support DOE's research and development activities and programs. Under a DOE-HALEU demonstration program, Centrus plans to deploy a small cascade of centrifuges to demonstrate the capability to produce HALEU. NRC staff is reviewing an amendment application from Centrus to allow enrichment up to 19.75 percent to produce HALEU.

Louisiana Energy Services (Eunice, NM) has expressed interest in a license amendment authorizing it to enrich uranium to 19 percent. The Louisiana Energy Services license was amended recently to remove a constraint that prevented it from enriching uranium up to the current license authorization (5.5 percent). Global Nuclear Fuel – Americas (Wilmington, NC) has expressed interest in a license amendment authorizing fabrication of fuel containing uranium enriched to 8 percent. Global Nuclear Fuel recently obtained NRC approval of its minimum margin of subcriticality for processing uranium enriched to 8 percent.

The NRC staff has held multiple pre-application meetings with X-Energy regarding a fuel fabrication facility that would produce HALEU fuel for a pebble-bed reactor. The application is expected in June 2021. Initial meetings discussed a new, stand-alone facility. However, recent meetings have discussed a joint venture with an existing fuel fabrication facility.

In the near term, NRC will use existing data, guidance, and regulatory tools to review licensing actions for the production and transportation of higher enriched uranium material (up to 19 percent). No changes in the regulatory framework are needed in the near term. However, licensees may seek an exemption to 10 CFR 71.55(b) to perform the criticality analysis for Uranium Hexafluoride (UF<sub>6</sub>), packages without water inside the package. As a long-term action, NRC will need to consider rulemaking or employ the use of other regulatory tools (e.g. orders, license conditions) for security and safeguards to support the fabrication and transportation of special nuclear material enriched above 10 weight percent U-235. After the terrorist attacks on September 11, 2001, requirements for additional security measures were established for Special Nuclear Material in Category I (uranium enriched above 20 percent) and Category III (uranium enriched up to 10 percent). However, additional security measures have not been established for Special Nuclear Material in Category II (uranium enriched between 10 percent and 20 percent).

## **Licensing and Oversight Activities for Molybdenum-99 Facilities (NRR)**

The most widely used radioisotope in nuclear medicine is technetium-99 metastable (technetium-99m, Tc-99m), the daughter product of molybdenum-99 (Mo-99). In the U.S., approximately 50,000 procedures are performed daily – or over 18 million procedures each year – using Tc-99m. Tc-99m is prepared and injected into the body as part of a “kit,” which consists of the non-radioactive chemicals (or compounds) to which the radioisotope is added, forming the radiopharmaceutical. Kits are specifically developed to accumulate in organs of interest. Common imaging procedures include cardiac perfusions and bone scans. There is currently no widely available domestically produced supply of Mo-99 for Tc-99m procedures in the U.S. However, there are several U.S. companies interested in Mo-99 production.

The NRC supports national security interests and nuclear nonproliferation policy objectives related to establishing a domestically available and reliable supply of Mo-99 without the use of highly enriched uranium. In accordance with its statutory responsibilities, the NRC is responsible for licensing utilization facilities; production facilities; and special nuclear, byproduct, and source material. Specifically, the NRC staff reviews both initial license applications and license amendment requests for nuclear reactors, subcritical operating assemblies, and production facilities. These facilities would produce Mo-99 either by neutron irradiation of molybdenum targets or fission of low enriched uranium (LEU) targets and subsequent processing to separate Mo-99 from other fission products. The NRC also reviews applications for manufacturing of LEU targets and medical uses of byproduct material associated with Tc-99m generator systems.

In support of ongoing and anticipated licensing reviews and the start of construction inspection activities, the NRC staff is engaging with prospective applicants and licensees, developing facility-specific inspection plans, updating guidance, and identifying staff roles and responsibilities.

### **Licensing Activities**

In November 2018, NorthStar Medical Radioisotopes (NorthStar) became the first limited production commercial domestic supplier of Mo-99 since 1989, following issuance of an NRC safety evaluation report for its RadioGenix Tc-99m generator system in October 2018. In February 2016 and May 2018, the NRC issued construction permits to SHINE Medical Technologies, Inc. (SHINE) and Northwest Medical Isotopes, LLC (NWMI), respectively, authorizing construction of these facilities for the production of medical radioisotopes.

#### *SHINE Medical Technologies, LLC*

In July 2019, SHINE submitted an operating license application for the SHINE Medical Isotope Production Facility to be located in Janesville, Wisconsin. SHINE proposed to operate the facility for the production of Mo-99 through the irradiation and processing of a uranyl sulfate solution. As described in the operating license application, the proposed facility would consist of an irradiation facility and radioisotope production facility. The irradiation facility would consist of eight subcritical operating assemblies (or irradiation units), which would each be licensed as a utilization facility, as defined in 10 CFR 50.2, and supporting structures, systems, and components for the irradiation of LEU. The radioisotope production facility would consist of hot cell structures, licensed collectively as a production facility, as defined in 10 CFR 50.2, and associated structures, systems, and components for the processing of irradiated material and

extraction and purification of Mo-99. The irradiation facility and radioisotope production facility are collectively referred to as the SHINE Medical Isotope Production Facility. Issuance of the operating license would authorize SHINE to operate the facility for a 30-year period.

The NRC staff accepted SHINE's operating license application for docketing and review on October 8, 2019. The NRC staff estimates that completion of the review of the application will take approximately twenty-four months from the date of acceptance. To support the review of the operating license application, the NRC staff continues to focus on technical areas such as environmental subjects, digital instrumentation and control systems, physical security, accident analysis, and electrical power systems.

SHINE began formal construction activities in September 2019, with site excavation and pouring of a concrete mudmat. Initial inspection activities related to quality assurance, structural concrete, and foundations and buildings began in December 2019. Additional inspections of concrete and structural steel will be scheduled once the facility is weather-tight in Q2FY20. Construction is expected to be completed in FY22.

#### *Northwest Medical Isotopes, LLC*

NWMI is the holder of a permit that authorizes it to construct a 10 CFR Part 50 production facility that would process irradiated LEU targets. NWMI has yet to submit an operating license application and will also need a 10 CFR Part 70 license to manufacture LEU targets at the proposed facility. A separate licensing action would be needed to authorize NWMI's plan to irradiate LEU targets at an existing research reactor.

In FY21, the NRC staff expects to receive details regarding NWMI's plans and schedule for its operating license application, for related license applications, and for proposed operation of the facility.

#### *NorthStar Medical Radioisotopes*

In February 2018, the NRC staff issued 10 CFR Part 35 licensing guidance for medical-use applicants and licensees that possess the RadioGenix generator system. NorthStar began commercial production of Mo-99 in November 2018 following the issuance of an NRC safety evaluation report for its generator system. This milestone came in the midst of a global shortage caused by concurrent shutdowns of facilities in South Africa, Australia, and the Netherlands. NorthStar developed the RadioGenix generator system for use with low-specific activity Mo-99 produced by neutron irradiation of Mo-98 or Mo-100 targets. The University of Missouri – Columbia Research Reactor irradiates NorthStar's Mo-98 targets under its current NRC facility operating license.

#### *Niowave, Inc.*

Niowave is pursuing a three-phase approach to commercial Mo-99 production. In 2015, Region III staff issued a materials license to Niowave, allowing proof-of-concept demonstrations of Mo-99 production through fission of solid uranium targets (Phase 1). Niowave has built natural and LEU subcritical assemblies for irradiation testing and is working with Argonne National Laboratory on target processing, radiochemistry, and target manufacturing. Niowave is pursuing licensing actions with Region III for scaling up its non-commercial operations (Phase 2). Niowave intends to engage with the NRC in FY21 on its plans for commercial development

(Phase 3) and whether it would require Part 70 or Part 50 licenses for its LEU irradiation and processing activities.

#### *Prospective Part 50 Applicants*

Other prospective applicants, including Flibe Energy, Niowave, Eden Radioisotopes, and Atomic Alchemy, Inc., have indicated interest in applying for construction permits and operating licenses for facilities that would produce Mo-99 and other commercial radioisotopes using LEU-based methods. These companies have participated in pre-application meetings with the NRC staff and submitted correspondence. The NRC staff could begin reviews of initial license applications as soon as FY21, although there is some uncertainty in proposed submission dates.

#### **Oversight Activities**

In December 2015, the NRC staff published Inspection Manual Chapter (IMC) 2550, establishing a construction inspection program for non-power production and utilization facilities designed to produce medical radioisotopes, such as Mo-99. One of the primary objectives of the inspection program is to verify that the construction permit holder implements its quality assurance program for design, procurement, and construction. Inspections will be commensurate with the risk of the facility, focusing on the most safety-significant structures, systems, and components. Specific procedures within the program cover safety-related items, quality assurance program implementation, and operational readiness. Since initial publication, the NRC staff updated the program and its associated procedures to include guidance for determining the effectiveness of a construction permit holder's corrective action program and guidance on responding to a construction permit holder's notification to the NRC that construction of its facility is substantially complete. The NRC staff is currently developing procedures for operational inspections and operator licensing.

## **Transportation of Spent Nuclear Fuel (NMSS)**

NRC and the U.S. Department of Transportation (DOT) co-regulate transportation of radioactive material, which includes spent fuel shipments. The NRC and DOT regulations support the safe packaging and transportation of the smallest quantities of radioactive material (e.g., lab samples) to the largest quantities (e.g., spent nuclear fuel). A Memorandum of Understanding between the NRC and DOT (published on July 2, 1979 (44 FR 38690)), delineates each Agency's responsibility. The DOT is the lead agency for regulating the packaging and transportation of small quantities of radioactive material (Type A quantities or less as determined using Appendix A to 10 CFR Part 71); low specific activity and surface contaminated objects; and carriers who transport radioactive material. The NRC is the lead agency for regulating the packaging and transportation of fissile materials and quantities of licensed material in excess of a Type A quantity (i.e., Type B quantities of radioactive material).

The NRC has approved packages for transport of dual-purpose canisters and casks containing spent fuel for the most widely used storage cask designs. The NRC staff can prioritize and process amendments to existing spent fuel package certificates of compliance, as needed. The NRC can prioritize the review of amendments based on the expected shipping schedule.

Prior to commencement of a large-scale campaign for shipment of spent fuel, licensees would need to reconcile their dual-purpose canisters/casks that are in storage with the respective transport package approvals. This reconciliation involves review of any design changes to the canisters or casks that occurred during fabrication or storage and review of the spent fuel assembly characteristics. This ensures the transportation package certificate of compliance authorizes shipment of the casks or canisters and spent fuel assemblies.

In addition to package approvals, the NRC reviews the transportation routes for spent fuel shipping. If the NRC ISFSI licensee is the shipper, the licensee must seek NRC approval of the route in accordance with physical protection requirements in 10 CFR 73.37. However, if DOE is the shipper, the DOE is not subject to NRC security requirements. However, the DOE has committed to meet or exceed the requirements prescribed by DOT and NRC for comparable commercial transportation. The NRC staff also inspects manufacturers of transportation packages to provide additional assurance that transportation packages conform to NRC approved designs and are manufactured in accordance with NRC approved quality assurance programs.

The NRC has the infrastructure in place to oversee the shipment of spent fuel. The NRC is in the process of assessing its readiness to regulate a major spent fuel shipping campaign, including package approvals and safety and security inspections. To determine its readiness, NRC is conducting an in-depth holistic assessment of the spent fuel transportation regulatory programs, including licensing, oversight, and strategies for communication, under the NRC's safety and security programs. The NRC readiness will assess existing regulations, guidance, internal and external communication procedures, specific information needs, and the availability of that information. The NRC expects to complete the readiness assessment by summer of 2021. The initial readiness assessments have indicated that no large-scale changes to NRC processes or regulations are necessary to support a spent fuel transportation campaign.

## **Westinghouse Issues (NMSS)**

The NRC staff is working toward timely completion of the review of the license renewal application for the Westinghouse Electric Company, LLC (WEC) Columbia Fuel Fabrication Facility (CFFF) located in Hopkins, South Carolina. The facility fabricates fuel assemblies for pressurized water reactors and boiling water reactors using up to 5 percent enriched uranium. The facility uses a wet-chemical ammonium diuranate precipitation process to convert UF<sub>6</sub> gas into UO<sub>2</sub> powder. The powder is then pressed into pellets and sintered. The pellets are then loaded into fuel rods, sealed, and the rods are fabricated into fuel assemblies prior to shipment to reactors. The original WEC CFFF license was issued in 1969. The license has been renewed 4 times, with the current license authorizing operations until 2027. The licensee voluntarily submitted a 40-year license renewal application in 2012.

There are several issues that have impacted staff's review of the license renewal application. In 2016, WEC reported a near criticality event in the scrubber resulting in a plant shutdown. This event resulted in a special inspection and NRC issuing a Confirmatory Order documenting the violations, corrective actions to date, and other requirements. In 2017, WEC filed for bankruptcy and in 2018, NRC approved an indirect transfer of control to Brookfield WEC Holdings, Inc. During this time, WEC requested that all NRC efforts focus on the transfer of control. In 2018, the NRC staff finalized the Safety Evaluation Report and published the completed Environmental Assessment (EA) (<https://www.nrc.gov/docs/ML1812/ML18120A318.pdf>) and Finding of No Significant Impact (FONSI) in the *Federal Register* (<https://www.govinfo.gov/content/pkg/FR-2018-06-15/pdf/2018-12841.pdf>). Shortly thereafter, in July 2018, there was a leak from equipment at the CFFF that resulted in uranium entering the subsurface under the facility building. In addition, in 2019, WEC initiated an investigation, under the purview of the South Carolina Department of Health and Environmental Control (SCDHEC), into a leak that occurred in 2011 from a buried pipe that resulted in uranium leaking under the main facility building. Because of new information regarding onsite contamination and to better address the public's concerns about the releases, the NRC decided to re-open its environmental review. The NRC staff withdrew the June 2018 EA and FONSI and, in October 2019, published in the *Federal Register* (<https://www.govinfo.gov/content/pkg/FR-2019-10-28/pdf/2019-23419.pdf>) an updated draft EA (<https://www.nrc.gov/docs/ML1922/ML19228A278.pdf>) (re-opened environmental review) for public review and comment. The NRC also conducted a public meeting in November 2019 in Columbia, SC to gather comments on the draft EA.

Based on new information discussed in WEC's February 2020 Interim Remedial Investigation Data Summary Report (<https://www.nrc.gov/docs/ML2006/ML20063P321.pdf>), the NRC staff was not able to make a FONSI and, per 10 CFR 51.31(a), the NRC is preparing an environmental impact statement (EIS). The staff notified WEC of this decision in June 2020. New information has revealed uncertainty related to the source and extent of contamination onsite and the potential future migration pathways offsite. Comments provided on the draft EA will be considered in the development of the EIS.

The NRC published the notice of intent (<https://www.govinfo.gov/content/pkg/FR-2020-07-31/pdf/2020-16150.pdf>) to prepare an EIS and the beginning of the scoping process on July 31, 2020 in the *Federal Register*. The scoping public comment period ended on August 31, 2020. Staff is currently working on the draft EIS and is developing requests for additional information to send to WEC. The current schedule, transmitted to WEC on August 10, 2020 (<https://www.nrc.gov/docs/ML2021/ML20217L372.pdf>), is for the draft EIS to be published for

public review and comment in April 2021, and the final EIS to be completed by November 2021 with the final decision on the license renewal to be completed by December 2021.

## **Independent Spent Fuel Storage Installation (ISFSI) Inspection Program Changes (NMSS)**

The NRC staff initiated a holistic review of the Independent Spent Fuel Storage Installation (ISFSI) inspection program in June 2019 (ADAMS Accession No. ML19155A273) to evaluate and enhance the NRC's existing ISFSI inspection program by developing a clearer, more risk-informed, comprehensive, and consistent approach to ISFSI inspections across the four regions. The working group used probabilistic risk analyses, byproduct material radiation exposure studies, subject matter expertise, operating experience, and lessons learned from the last 30 years of ISFSI inspection history to inform the recommended revisions to the program.

The working group provided a status of its efforts and solicited public feedback on its recommendations at a number of public meetings and at multiple locations, which allowed members of the public from different geographic regions to participate. The final report documenting the working group's recommendations was completed and made publicly available on March 18, 2020 (ADAMS Accession No. ML20078P093). The Division of Fuel Management (DFM) Director approved the working group's recommendations in full on March 19, 2020 (ADAMS Accession No. ML20079E064).

The approved recommendations consist of a more risk informed inspection program that incorporates five safety focus areas (i.e., risk significant areas) in the oversight program and includes: 1) a triennial inspection frequency for routine inspections; 2) inspections performed by qualified ISFSI inspectors using current qualification requirements, or application of a "partial qualified" concept as part of the new cross-qualification program; 3) a revised level of effort estimate and focus on the risk-significant ISFSI activities for each applicable inspection procedure; and 4) ISFSI inspections funded solely by the Spent Fuel Storage and Transportation business line. Successful implementation of the recommendations across all NRC regions will ensure that the NRC maintains focus on its mission while supporting the NRC's vision of becoming a modern, risk-informed regulator by embracing improvements in our decision-making and a graded approach to safety.

A separate working group was formed in June 2020 to perform implementation activities and ensure consistency and efficiency in the regional review and concurrence process of the draft inspection program governance documents. Specifically, the working group is leading the effort to revise Inspection Manual Chapter (IMC) 2690 and Inspection Procedures (IP) 60853 through 60858, that comprise the ISFSI inspection program, and to issue a new IMC 2691 as the ISFSI inspection program technical basis document. Issuance of these documents as well as performing training of the ISFSI inspectors that will be implementing the program is planned to be completed before the revised ISFSI inspection program planned effective date of January 1, 2021.

## **Centrus Enrichment Corporation Licensing Activities (NMSS)**

The NRC staff is in the process of conducting the required safety, safeguards, security, and environmental licensing reviews of license amendment applications to support the restart of uranium enrichment operations at Centrus Enrichment Corp.'s Piketon, Ohio facility.

In May 2019, the U.S. Department of Energy (DOE) and American Centrifuge Operating, LLC (ACO), a subsidiary of Centrus Energy Corp. (Centrus), signed a 3-year contract to restart uranium enrichment operations for the demonstration and production of high-assay low-enriched uranium (HALEU). The details of the contract were finalized in October 2019.

DOE's HALEU Demonstration and Production Program has two primary objectives:

1. Deploy a 16-machine cascade producing 19.75 percent uranium-235 (U-235) enriched HALEU product; and
2. Demonstrate the capability to produce HALEU with existing U.S.-origin enrichment technology and provide DOE up to 600 kg of HALEU in the form of UF<sub>6</sub> for use in its research and development activities and other programmatic missions.

The site for the proposed demonstration facility is within the existing structures and areas that housed the American Centrifuge Lead Cascade Facility (LCF) in Piketon, Ohio. After operating the LCF for almost 10 years (2007-2016), ACO decommissioned the LCF in 2018. The existing structures in Piketon were also meant to be part of Centrus' much larger commercial American Centrifuge Plant (ACP) that was licensed by the NRC in 2007. To date, no significant construction activities have taken place for the ACP. If the amendment applications for the 16-machine HALEU cascade are approved, the LCF license would be subsumed into the ACP license.

The NRC staff accepted the larger portion of the amendment application for detailed technical review in June 2020 and anticipates completing its reviews by June 2, 2021.

On January 29, 2020, Centrus submitted its Foreign Ownership Control or Influence (FOCI) package update that included the appointment of an independent outside monitor who periodically reports to the NRC. The NRC approved Centrus' FOCI update on August 14, 2020. Centrus also manufactures the centrifuge parts needed for the 16-centrifuge HALEU cascade discussed above at its Technology and Manufacturing Center (TMC) in Oak Ridge, TN. Centrus submitted its classified matter security plans for the TMC to the NRC in February 2020 for review and approval. The NRC staff anticipates completing its review of the plans by the end of February 2021.

Centrus also submitted its classified matter security plans for the Piketon facility and its transportation security plan in March 2020 for review and approval. The NRC staff approved the transportation security plan on October 20, 2020 and completed its review of the classified matter security plans on October 30, 2020. These amendments will allow Centrus to transport centrifuge parts from the TMC to the Piketon facility and begin installation of the 16-centrifuge cascade.

## **Very Low-Level Waste Disposal (NMSS)**

The NRC regulates the disposal of radioactive wastes under its jurisdiction to ensure that people and the environment are protected. Some of this waste, with very low levels of radioactivity, called very low-level radioactive waste or VLLW, may be safely disposed of in hazardous and solid waste disposal facilities, or other locations that are not licensed under the requirements of 10 CFR Part 61, with prior NRC review and approval.

The 10 CFR Part 20 dose limit for individual members of the public is 1 millisievert/year (100 millirem/year), or 1 mSv/yr (100 mrem/yr). The NRC typically approves requests to dispose of VLLW in a non-Part 61 facility if the radiation exposure to a member of the public is projected to be no more than “a few millirem per year.” The NRC selected this criterion because it is a fraction of the natural radiation dose (approximately one percent of the radiation exposure received by members of the public from background radiation in the United States) and a fraction of the annual public dose limit.

The staff is engaging in the following activities related to the disposal of VLLW:

- **§ 20.2001 New Interpretation:** During review of the § 20.2002, “Method for obtaining approval of proposed disposal procedures,” alternative disposal process, staff identified a potential new interpretation of 10 CFR 20.2001(a). Section 20.2001(a) states, “A licensee shall dispose of licensed material only (1) By transfer to an authorized recipient...” Although “authorized recipient” is not defined in the regulation or associated statement of considerations, current NRC guidance defines the term to mean only licensed persons. The proposed interpretive rule would change this interpretation of “authorized recipient” to allow the transfer of licensed material not only to licensed persons, but also to persons who hold specific exemptions for the purpose of disposal. Staff is seeking public comment on this interpretation via a *Federal Register* Notice of a proposed interpretive rule (85 FR 13076, dated March 6, 2020; the comment period ends October 21, 2020). The feedback received to date through the comment process and during two public meetings on the proposed interpretive rule has been largely in opposition to the proposed interpretation, and the staff is in the process of recommending withdrawal of the proposed interpretation.
- **Alternative Disposal Request Guidance:** In April 2020, the staff issued updated guidance on alternative disposal requests for VLLW, which describes the NRC process for documenting, reviewing, and approving (on a case-by-case basis) requests for alternative disposal under 10 CFR 20.2002 and 10 CFR 40.13. This revision is the culmination of a multiyear effort for development of improved guidance.
- **Nuclear Energy Institute (NEI) v. NRC, No. 19-1240 (D.C. Cir.):** In November 2019, NEI filed a lawsuit challenging a September 2019 letter to NEI that restated the NRC’s interpretation of 10 CFR 20.2002. NEI disputes the NRC’s position that, under § 20.2002, NRC licensees must obtain NRC, rather than state, approval to depart from the NRC-approved methods of waste disposal that are set forth in the NRC regulations. In February 2020, the NRC and the Department of Justice jointly moved to dismiss NEI’s petition for review for lack of jurisdiction on the grounds that the NRC’s restatement of the agency’s position in the September 2019 letter is not a final order subject to judicial review. NEI responded to the motion on March 11, 2020. On June 2, 2020, the motion to dismiss was referred to the merits panel in the D.C. Circuit, meaning the case (including the jurisdictional

issues) will be fully briefed on the merits. NEI's brief is due September 30, 2020; the NRC's brief is due January 8, 2021. Oral argument has not yet been scheduled.

- Very Low-Level Radioactive Waste Scoping Study: The VLLW Scoping Study was conducted to identify the actions that the NRC should take to strengthen its regulatory framework for VLLW. A *Federal Register* notice was issued on February 14, 2018, soliciting comments on the VLLW Scoping Study, and the staff held two public meetings on the study. Some of the comments received during the public meetings include: (1) the NRC should continue to use the Part 61 classification system and use § 20.2002 for disposing of the lower end of Class A waste; (2) the NRC should align VLLW with International Atomic Energy Agency standards for Classification of Radioactive Waste contained in general safety guide, GSG-1; (3) the NRC should proceed with a rulemaking to establish a category of VLLW; and (4) creation of a VLLW category will adversely affect the financial stability of some disposal sites. In the third quarter of FY21, the staff plans to issue a CA note with the results of the VLLW Scoping Study and a description of the planned path forward.

## **Fuel Facilities (NMSS)**<sup>1</sup>

The U.S. Nuclear Regulatory Commission (NRC) licenses fuel cycle facilities that include uranium conversion, uranium hexafluoride (UF<sub>6</sub>) deconversion, enrichment, and fuel fabrication. This includes applications for new licenses, license amendments, and renewals. The agency also routinely inspects licensees' safety, safeguards, security, and environmental protection programs. Currently in the U.S. there are ten licensed fuel cycle facilities with seven of those currently operating. Below is a description of the different types of fuel cycle facilities.

### **Uranium Conversion**

After the uranium ore concentrate is produced at the mill (where it becomes uranium oxide or "yellow cake" (<https://www.nrc.gov/reading-rm/basic-ref/glossary/yellowcake.html>)), it is packaged in 55 gallon drums and sent to the uranium conversion plant. At the conversion facility, the yellow cake is processed and is then reacted with fluorine to create uranium hexafluoride (UF<sub>6</sub>). Uranium, in the chemical form of UF<sub>6</sub>, is suitable for use in enrichment operations and is the desired product. The UF<sub>6</sub> exits the process as a gas which is then cooled to a liquid and drained into 14-ton storage and transport cylinders. As the UF<sub>6</sub> cools over the course of five days, it transitions from a liquid to a solid. The cylinder, with UF<sub>6</sub> in the solid form, can then be shipped to an enrichment (<https://www.nrc.gov/materials/fuel-cycle-fac/ur-enrichment.html>) plant.

There is one commercial uranium conversion plant in the United States. The plant is Honeywell International Inc. (<https://www.nrc.gov/info-finder/fc/honeywell-works-uranium-conv-il-lc.html?panel=0#panel0>) (docket 07003392) and it is located in Metropolis, Illinois. The facility license was recently renewed in 2020 to operate until March 24, 2060. This plant is currently in "idle-ready" status due to excess supply in the source material uranium market.

### **Deconversion of Depleted Uranium**

A process called "deconversion" chemically extracts the fluoride from the depleted uranium hexafluoride (DUF<sub>6</sub>) and produces chemically stable compounds of uranium, commonly referred to as uranium oxides. The deconversion process significantly reduces the chemical hazards associated with depleted uranium. The deconversion process separates the fluoride atoms from the UF<sub>6</sub> and replaces them with oxygen. The chemical compounds that result are depleted uranium dioxide (UO<sub>2</sub>) and depleted tri-uranium oct-oxide (U<sub>3</sub>O<sub>8</sub>). These oxides are similar to the chemical form of uranium in nature. The compounds are chemically stable, compared to depleted UF<sub>6</sub>, and are generally suitable for disposal as low-level radioactive waste at a licensed disposal facility.

Another purpose of the deconversion process is to recover high purity fluoride compounds which have commercial value. Fluoride compounds are used in the production of refrigerants, herbicides, pharmaceuticals, high-octane gasoline, aluminum, plastics, electrical components, and fluorescent light bulbs.

On October 2, 2012, the NRC issued a 40-year license for International Isotopes (<https://www.nrc.gov/info-finder/fc/iifp-lea-co-nm-lc.html>) Fluorine Products, Inc. (IIFP), a

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<sup>1</sup> See Location of Fuel Cycle Facilities (<https://www.nrc.gov/info-finder/fc/>) for a list of fuel cycle facilities licensed by the NRC.

subsidiary of International Isotopes, Inc., to construct and operate a fluorine extraction and depleted uranium deconversion facility near Hobbs, NM. The construction of the facility is on hold pending IIFP's commercial decision to move the project forward.

## Uranium Enrichment

The nuclear fuel (<https://www.nrc.gov/reading-rm/basic-ref/glossary/nuclear-fuel.html>) used in a light water nuclear reactor needs to have a higher concentration of the  $U^{235}$  isotope than that which exists in natural uranium (<https://www.nrc.gov/reading-rm/basic-ref/glossary/natural-uranium.html>) ore.  $U^{235}$  when concentrated (or "enriched") is fissionable (<https://www.nrc.gov/reading-rm/basic-ref/glossary/fissionable-material.html>) in light-water reactors (<https://www.nrc.gov/reading-rm/basic-ref/glossary/light-water-reactor.html>) (the most common reactor design in the USA). Commercially, the  $U^{235}$  isotope is enriched (<https://www.nrc.gov/reading-rm/basic-ref/glossary/uranium-enrichment.html>) to 3 to 5% (from the natural state of 0.7%) and is then further processed to create nuclear fuel. Industry is developing new technologies using Accident Tolerant Fuel and High Assay Low-Enriched Uranium that will require increased enrichment.

Gas centrifuge enrichment is the current process by which commercial enrichment is being performed in the United States.  $UF_6$  gas is placed in a gas centrifuge cylinder and rotated at a high speed. This rotation creates a strong centrifugal force so that the lighter gas molecules (containing  $U^{235}$ ) can be concentrated as the gas moves through multiple stages of the centrifuges interconnected to form trains and cascades. At the final withdrawal point, the  $UF_6$  is enriched to the desired amount.

Laser separation is another technology for possible use to enrich uranium. Uranium can be enriched by separating isotopes of uranium with lasers. Molecules can be excited by laser light; this is called photoexcitation. Lasers can increase the energy in the electrons of a specific isotope, changing its properties and allowing it to be separated. Currently though, no laser separation uranium enrichment plants are operating in the United States.

The only gas centrifuge commercial production plant in the US is the URENCO (<https://www.nrc.gov/info-finder/fc/urenco-enrichment-fac-nm-lc.html>) USA (UUSA) facility licensed as Louisiana Energy Services (LES). UUSA is currently operating in Eunice, NM. The facility is currently licensed to operation until June 9, 2040. In addition, American Centrifuge Plant (<https://www.nrc.gov/info-finder/fc/usdoe-gdp-american-centrifuge-plant-oh-lc.html>) (gas centrifuge) was issued a license in 2007 but no significant post-licensing construction of the American Centrifuge Plant has taken place. Global Laser Enrichment (<https://www.nrc.gov/info-finder/fc/global-laser-enrichment-nc-lc.html>) was issued a license in 2012 but construction of the facility is not currently proceeding.

## Fuel Fabrication

### Low-Enriched Uranium Fuel Fabrication

Fuel fabrication for light water reactors (LWR) (<https://www.nrc.gov/reading-rm/basic-ref/glossary/light-water-reactor.html>) (regular commercial power reactors) typically begins with the receipt of low-enriched uranium, in the chemical form of uranium hexafluoride ( $UF_6$ ), from an enrichment plant (<https://www.nrc.gov/materials/fuel-cycle-fac/ur-enrichment.html>). The  $UF_6$  is received as a solid in 2-metric ton shipping containers. The solid  $UF_6$  is heated to gaseous form and then chemically processed to form uranium dioxide ( $UO_2$ ) powder. This powder is

pressed into pellets, sintered into ceramic form, loaded into Zircaloy tubes, and constructed into fuel assemblies, prior to transport to power reactors.

Three fuel fabrication plants processing low-enriched uranium are currently licensed by the NRC: Global Nuclear Fuel-Americas (<https://www.nrc.gov/info-finder/fc/global-nuc-fuels-america-fuel-fab-lc.html>) in Wilmington, North Carolina – licensed to operate till May 19, 2049; Westinghouse Columbia Fuel Fabrication Facility (<https://www.nrc.gov/info-finder/fc/westinghouse-fuel-fab-fac-sc-lc.html>) in Columbia, South Carolina – licensed to operate till September 30, 2027 (currently under voluntary license renewal); and Framatome Inc. (<https://www.nrc.gov/info-finder/fc/areva-np-lc.html>), in Richland, Washington – licensed to operate till April 24, 2049. These facilities are also called Category 3 Fuel Facilities (<https://www.nrc.gov/reading-rm/basic-ref/glossary/categories-of-fuel-facilities.html>).

### High Enriched Uranium Fuel Fabrication

NRC regulates fuel fabrication facilities that have government contracts to produce fuel for the U.S. Naval Reactors program and to down-blend highly enriched uranium (HEU) with other uranium to create low-enriched uranium reactor fuel. The HEU being blended down to lower enrichment comes from Russian or U.S. weapons programs as part of an international arms control agreement.

Two Category 1 fuel fabrication plants are currently licensed by the NRC: Nuclear Fuel Services (NFS) (<https://www.nrc.gov/info-finder/fc/nuclear-fuel-services.html?panel=0#panel0>) in Erwin, Tennessee – licensed to operate till August 31, 2037 and the BWXT Nuclear Operations Group (<https://www.nrc.gov/info-finder/fc/bwxt-nuclear-lc.html>) plant in Lynchburg, Virginia – licensed to operate till March 29, 2027. These facilities produce nuclear fuel containing both high-enriched and low-enriched uranium.

## **Cyber Security (NSIR)**

In March 2009, the NRC published a cyber security rule for nuclear power reactor licensees (10 CFR 73.54) to ensure that licensees provide high assurance that digital computer and communication systems and networks associated with safety-related and important-to-safety, security, and emergency preparedness functions are adequately protected against cyber attacks, up to and including the design-basis threat in 10 CFR 73.1. In 2010, the NRC issued Regulatory Guide 5.71, "Cyber Security Programs for Nuclear Facilities," (ADAMS Accession No. ML090340159) setting forth methods that the NRC staff deems acceptable for complying with the cyber security rule. This rule requires nuclear power plant licensees to develop and implement a site-specific cyber security plan. The NRC has reviewed and approved these plans for all operating nuclear power plant licensees and for Vogtle Units 3 & 4. All of the operating reactor plants have fully implemented the cyber security programs as described in their respective cyber security plans.

Implementation of the cyber security rule requires nuclear power plant licensees to identify and protect from cyber attack critical digital assets (CDAs) that if compromised could adversely affect safety, security, and emergency preparedness functions. The NRC staff engaged with the power reactor industry to develop a graded process for streamlining the protection of lower consequence CDAs to manage the regulatory burden, without compromising the degree of protection afforded by cyber security requirements at nuclear power plants. This process assisted licensees' efforts to focus cyber security resources on those CDAs that can have the most significant impact on safety and security and emergency preparedness functions.

The NRC staff identified seven interim cyber security milestones for all operating nuclear power plants that emphasized the appropriate level of cyber protection for the most significant digital assets. Licensees implemented these interim milestones by December 31, 2012. From 2013 through 2015, the staff inspected all of the interim milestone implementations. The eighth milestone, full implementation of the licensee's cyber security plan, was completed by most licensees on December 31, 2017. As the industry completed cyber security program full implementation, staff developed an inspection program for the power reactor cyber security program and a process for evaluating the significance of cyber-related inspection findings. Inspections of full implementation began in mid-2017 and will continue through June 2021. New reactor applicants are also subject to the cyber security requirements and will be inspected for compliance with the NRC's cyber security rule during construction.

In 2019, the NRC conducted a program assessment to collect feedback and lessons learned from stakeholders regarding the cyber security rule for nuclear power plants. This included an assessment of associated guidance, licensee implementation of their site-specific cyber security programs, and the NRC inspection program. The assessment results are being used to further risk-inform the cyber security oversight program. In October 2019, the NRC staff developed an Action Plan to coordinate follow-on activities arising from the cyber program assessment. The plan includes the following areas: clarification of program definitions and terms; further risk-informing of critical digital asset determination; critical digital asset assessment; critical digital asset protection (cyber control implementation); and further performance-informing of the power reactor cyber inspection oversight program. The staff intends to complete the follow-on activities in mid-calendar year 2021.

In November 2015, the NRC published a final rule, 10 CFR 73.77, "Cyber Security Event Notifications," (effective December 2, 2015). This rule requires timely notification to the NRC of

cyber security events that cause or could cause adverse impacts to safety-related and important-to-safety, security, and emergency preparedness functions. This rule requires nuclear power reactor licensees to notify the NRC within certain established timelines after the discovery of a cyber attack that did or could have adversely impacted their safety-related and important-to-safety, security, or emergency response functions. As of August 2020, the staff had not received any licensee event notification reports resulting from the 10 CFR 73.77 rule.

In 2014, the NRC developed and issued a cyber security roadmap to discuss plans for evaluating cyber security requirements for other NRC license holders, including fuel cycle facilities, non-power reactors, independent spent fuel storage installations (ISFSIs), and byproduct materials licensees (ADAMS Accession No. ML12135A050). The NRC staff revised the cyber security roadmap paper in 2017 (ADAMS Accession No. ML16354A258) and intends to complete an additional update in late calendar year 2020.

In December 2014, the NRC staff proposed several options to the Commission in SECY-14-0147 (ADAMS Accession No. ML14177A264) for implementing cyber security requirements for fuel cycle facilities. In March 2014, the Commission issued the SRM for SECY-14-0147 (ADAMS Accession No. ML15083A175), which directed the staff to initiate a high priority, expedited rulemaking. The NRC staff published the regulatory basis for the proposed rulemaking in April 2016 and submitted the proposed rule package to the Commission in October 2017.

The staff has conducted cyber security assessments at non-power reactors, ISFSIs, and byproduct materials licensees. The NRC is implementing the activities set forth in the cyber security roadmap to provide industry with information and best practices to ensure that appropriate levels of cyber security are implemented at all NRC-licensed facilities and to identify potential program improvements.

NRC staff have developed relationships with DHS's Cyber and Infrastructure Security Agency, DOE's Office of Cybersecurity, Energy Security, and Emergency Response, and the Federal Energy Regulatory Commission, among other organizations. The staff participates in multiple working groups and bilateral engagements to share cyber security implementation lessons learned. Similarly, the staff regularly engages with organizations both in the IAEA and in foreign regulatory bodies, in a wide variety of international cyber security efforts.

### **Force-on-Force Enhancements (NSIR)**

The objective of the NRC's force-on-force (FOF) program is to conduct exercises at nuclear power reactor sites and other major nuclear facilities that, to the maximum extent practicable, simulate security threats in accordance with the applicable design basis threat (DBT) as required by Section 170D of the Atomic Energy Act (AEA). These exercises are designed to assess whether the private security force for a licensed facility can defend against those threats.

The current FOF inspection program was developed following the terrorist attacks of September 11, 2001 and implemented in November 2004. FOF inspections are completed on a triennial inspection cycle to satisfy the periodicity requirements of the AEA. During the first triennial inspection cycle (2004-2007), the NRC made several program adjustments in response to lessons learned, including developing general inspector guidance, developing and implementing an interim inspector qualification program, and hiring security specialists with specific skill sets suitable for conducting effective FOF inspections.

During subsequent inspection cycles, the program has evolved from three exercises per inspection in the first cycle, to two exercises and a training exercise in the third cycle (2011-2013), to two exercises in the fifth cycle (2017-2019). The programmatic changes were based on the staff's self-assessments required by the reactor oversight process; implementation of inspection program efficiencies; and consideration of the principle of "reasonable assurance of adequate protection."

In 2014, the Commission directed the staff to conduct a lessons-learned review of the FOF inspection program to evaluate whether any adjustments were necessary to ensure that the NRC was accomplishing its intended objectives effectively and whether NRC's and licensees' efforts were focused on the most important issues to ensure security and safety at the sites. The results of the lessons-learned review were provided in SECY-14-0088, "Proposed Options to Address Lessons-Learned Review of the U.S. Nuclear Regulatory Commission's Force-On-Force Inspection Program in Response to SRM-COMGEA/COMWCO-14-0001" (ADAMS Accession No. ML14139A231), dated August 20, 2014.

In this paper, the NRC staff provided options and recommendations in three areas: adversary tactics, techniques, and procedures; exercise realism via revision of the Multiple Integrated Laser Engagement System (MILES) software; and consideration of unattended openings. In addition to the options and recommendations, the staff committed to take action on the following: working with industry to identify, validate, and benchmark mechanisms, such as the use of simulation software, to evaluate potential vulnerabilities that may be inappropriate for performance testing during an NRC-conducted FOF exercise; updating the NRC Significance Determination Process (SDP) used to prioritize deficiencies associated with the security baseline inspection program; providing guidance to industry on compensatory measures; developing better guidance on exercise control and mission planning to improve the realism and effectiveness of NRC- and licensee-conducted FOF exercises; and evaluating updates to the FOF inspection procedure to provide flexibility and better guidance regarding the insider information provided to the mock adversary force (MAF) for NRC-conducted FOF exercises.

In February 2016, the staff updated the Commission via SECY-16-0018, "Status of Improvements to the Force-on-Force Inspection Program in Response to the SRM for SECY-14-0088" (ADAMS Accession No. ML16021A313), dated February 25, 2016. In this paper, the staff discussed its efforts to identify, validate, and benchmark mechanisms, such as: the use of

simulation software to evaluate potential vulnerabilities that may be inappropriate for performance testing during an NRC conducted FOF exercise; its efforts to revise the physical security SDP; its issuance of a draft Regulatory Issue Summary on compensatory measures for public comment; recent changes to the FOF inspection scenario development process to improve the realism and effectiveness of the FOF inspection program; the issuance of the results of the staff's review of the MILES software configuration; and the issuance of a revised SDP for unattended openings.

On June 1, 2016, the staff submitted SECY-16-0073, "Options and Recommendations for the Force-on-Force Inspection Program in Response to the SRM for SECY-14-0088," (ADAMS Accession No. ML16109A200). This paper included an update on the integrated response program, and a discussion of the future of the FOF inspection program. The paper also included analysis of feedback on the FOF program received from external stakeholders, including NEI, and comments from the Union of Concerned Scientists.

On Oct 5, 2016, the Commission issued the SRM for SECY-16-0073 (ADAMS Accession No. ML16279A345), directing the staff to submit a notation vote paper within 12 months on its recommendations for improvements to the security baseline inspection program, including FOF inspections. The staff was directed to look at only those areas that would yield improvements and efficiencies and not to conduct a fundamental redesign of the program. The staff was directed to consider internal and external feedback in its submittal. The staff was also directed to include the issues of using Diverse and Flexible Mitigation Capability (FLEX) equipment or response by local, state, and Federal law enforcement to credit operator actions.

On October 4, 2017, the staff submitted SECY-17-0100 (ADAMS Accession No. ML17223A279), which provided the results of the staff's assessment of the security baseline inspection program, including FOF, along with options and recommendations for Commission approval in response to the Commission's direction in SRM-SECY-16-0073.

In SRM-SECY-17-0100, "Staff Requirements – SECY-17-0100 – Security Baseline Inspection Program Assessment Results and Recommendations for Program Efficiencies" (ADAMS Accession No. ML18283A072), dated October 9, 2018, the Commission approved the staff's recommended option to modify the FOF inspection program to include one NRC-conducted FOF exercise and an enhanced NRC inspection of a licensee-conducted annual FOF exercise. In response, the staff submitted COMSECY-19-0006, "Revised Force-on-Force Inspection Program Framework" (ADAMS Accession No. ML19038A485), dated May 21, 2019, which provided the Commission the revised baseline security inspection program framework for review and approval, including the inspection procedures and significance determination process guidance associated with the framework. Subsequently, the staff submitted SECY-20-0070, "Technical Evaluation of the Security Bounding Time Concept for Operating Nuclear Power Plants" (ADAMS Accession No. ML20126G265), dated July 30, 2020, which presents the staff's approach for crediting operator actions, including the use of FLEX equipment, and law enforcement response at operating nuclear power plants.

Due to the COVID-19 Public Health Emergency (PHE), the NRC modified or deferred many of its planned inspection activities to align with practices recommended by the Centers for Disease Control and Prevention to limit the spread of the virus, and to protect the health and safety of plant personnel and NRC employees. Among these inspections were FOF inspections, which were temporarily halted due to the nature of the inspections. As it became clear that the PHE could continue for some time and following extensive discussion with stakeholders, the staff developed and implemented a special-case inspection procedure (IP) (using Appendix C of

Inspection Manual Chapter 2201) to perform prudent inspection activities until criteria are met for resumption of normal FOF exercise activities. The staff communicated this approach via July and August Commissioners' Assistants Notes (ADAMS Accession Nos. 20183A272 and ML20197A009, respectively). The Appendix C IP will be implemented through reviews of licensees' protective strategies, security plans, target sets, and site-specific or corporate implementing procedures; walkdowns of defensive positions, response ready-rooms, and staging areas; and participation in tabletop drills. In addition, the staff will verify and assess licensees' ability to conduct tactical response drills. Inspectors may issue violations for performance deficiencies, as is the case under the existing infrastructure for NRC-conducted FOF exercises. This approach will allow NRC staff to provide oversight of performance-based evolutions while both balancing risks associated with the PHE and protecting public health and safety, as the staff continues to assess when conditions will permit the resumption of full FOF exercises.

Since 2004, the industry has provided a MAF for NRC-conducted FOF exercises through the NEI-managed composite adversary force, in accordance with SRM-SECY-03-0208, "Adversary for Force-on-Force Exercises at NRC Licensed Facilities," dated December 23, 2003 (ADAMS Accession No. ML033570528; not publicly available). When Entergy and NextEra separated from NEI in February 2018, those utilities developed a separate MAF, referred to as the Joint Composite Adversary Force (JCAF). On March 14, 2018, the staff submitted COMSECY-18-0004 (ADAMS Accession No. ML18067A289), to obtain the Commission's approval for use of the proposed JCAF at NextEra and Entergy reactor sites in support of staff-conducted FOF inspections in 2018 and 2019. In assessing use of the JCAF, the staff determined that the proposed JCAF was a reasonable near-term alternative to the NEI-managed CAF that would allow the NRC to complete FOF inspections within the schedule required by Section 170D of the AEA, while longer-term approaches were identified and assessed.

On April 2, 2018, the Commission issued SRM-COMSECY-18-0004 (ADAMS Accession No. ML18092A387), approving the use of the JCAF at NextEra and Entergy reactor sites in support of NRC-conducted FOF exercises, for FOF inspections in 2018 and 2019 only. On May 6, 2019, the staff submitted SECY-19-0046, "Options for a Long-Term Alternative to the Nuclear Energy Institute Composite Adversary Force" (ADAMS Accession No. ML19074A078), with options and a recommendation for a long-term alternative to the NEI-managed CAF. On October 9, 2019, the Commission issued SRM-SECY-19-0046 (ADAMS Accession No. ML19282B628), approving the staff's recommended option to use one or more industry-managed MAFs and to allow the industry to implement and manage the MAFs for use during NRC-conducted force-on-force exercises.

**Protecting Nuclear Power Plants from Electromagnetic Pulses (EMPs) and Response to Electromagnetic Defense Task Force (EDTF) Report (NRR)**

President Trump issued Executive Order 13865, “Coordinating National Resilience to Electromagnetic Pulses” (EO 13865), in March 2019, and various EO 13865 requirements were subsequently enacted into law in December 2019 via section 1740 of the National Defense Authorization Act for Fiscal Year 2020 (Public Law 116-92, 133 Stat. 1198). NRC staff is actively engaging with other Federal agencies and stakeholders in a U.S. Government-wide approach to implement EO 13865 and the related statutory provisions and protect and mitigate electromagnetic pulse (EMP) effects on critical infrastructure. As part of this effort, staff is coordinating with our Sector Specific Agency, the Department of Homeland Security (DHS).

NRC staff has high confidence that nuclear power plants will safely shut down and maintain water level in spent fuel pools following an EMP event and a loss of all offsite power. The staff has confidence in nuclear power plants sustaining long term core cooling following an EMP event. NRC’s EMP conclusions are based on three Sandia National Laboratory (SNL) reports (1983, 2009, and 2010) that evaluated the effects of EMP (including both solar storms and man-made) on nuclear power plants (NPPs). These reports, along with the robust design features of reinforced concrete structures, standby mode of safety related electrical systems, and the availability of FLEX equipment, provide the basis for the staff’s confidence that NPPs will safely shut down following an EMP event. NPP facilities will require diesel fuel for generators to maintain core cooling and spent fuel pool water levels during a long-term loss of offsite power. The NRC is working with partner agencies (DHS, Department of Energy (DOE)) to address the availability of diesel fuel following an EMP event.

An EMP can be the result of space weather (solar storms) or man-made (nuclear detonation); EO 13865 defines EMP to include both types of events. A severe EMP may damage unprotected electrical and electronic components, with possible localized or large-scale power outages. Equipment at U.S. NPPs has occasionally been impacted or damaged by natural EMP events (solar storms). NRC licensees (predominantly in the northern states) have implemented voluntary precautions to mitigate solar EMP impacts, including the use of controlled reductions in power. Industry has also conducted EMP studies. A 2019 Electric Power Research Institute (EPRI) study indicates a high level of survivability of electrical and digital control systems in the electronic transmission system when exposed to EMP waves.

In 2018, the newly established Electromagnetic Defense Task Force (EDTF), an organization of military and civilian personnel with EMP expertise, published a report that raised concerns about potential EMP impacts on NPPs. During an April 2019 meeting with EDTF, NRC staff corrected inaccurate information related to the operation of NPPs and the authority of the NRC to impose additional requirements on existing licensees. The NRC staff provided written comments on the draft of a second EDTF report. The NRC staff position was provided in an appendix to the second report; however, the report was not otherwise modified to address any NRC concerns. The EDTF raised two primary issues (1) that the NRC considers EMPs beyond design basis events and therefore does not require licensees to protect NPPs against the effects of an EMP attack and (2) that physical EMP testing has not been conducted at an NPP. The NRC has not required applicants and licensees to provide for design features or other measures for the specific purpose of protection against hostile enemy EMP attacks. In general, defending against hostile enemy attacks is considered the responsibility of the nation’s defense establishment. However, the NRC requires adequate protection of public health and safety. To that end, as described in the statement of considerations for the promulgation of 10 CFR 50.13,

the containment and other procedures and systems for rapid shutdown of the facility could serve a useful purpose in protection against the natural and man-made EMP effects. Although these designs were not originally intended to protect against EMPs, DHS and DOE are conducting tests to better understand the effects of EMPs on critical infrastructure control systems as part of the implementation of EO 13865. NRC staff is coordinating with DHS and DOE on testing.

**Potential Updates to Regulatory Guide (RG) 5.69 – “Guidance for the Application of the Radiological Sabotage Design-Basis Threat for Nuclear Power Reactors” (NSIR)**

Following a June 23, 2016, closed Commission meeting regarding the proposed revision to Regulatory Guide (RG) 5.69, “Guidance for the Application of the Radiological Sabotage Design-Basis Threat for Nuclear Power Reactors,” the Commission directed the NRC staff to complete interactions with cleared stakeholders on the guidance updates, submit the revised RG 5.69 to the Committee to Review Generic Requirements (CRGR) for review, and provide the proposed final revision of RG 5.69 to the Commission for review and approval (SRM-M160623B, ADAMS Accession Number ML16179A382).

On November 7, 2017, the staff provided the revised RG to the CRGR for review. On May 22, 2018, the CRGR recommended removing the three proposed revisions on which alignment was not reached with industry. The CRGR concluded that if the RG included the proposed clarifications of the remaining three items the implementation of these items in simulated adversary tactics during FOF exercises could result in a backfit.

The staff worked with external stakeholders and the CRGR on the proposed revision to RG 5.69. The Nuclear Energy Institute (NEI), via an August 3, 2018, letter, aligned with the staff’s position that 10 of 14 proposed revisions to RG 5.69 were clarifications of existing regulatory requirements. NEI asserted that the following three proposed revisions to RG 5.69 expand existing requirements and would therefore be backfits: (1) use of explosives against personnel, (2) adversary use of explosives for wall breaching, and (3) coordinated attacks.

The Union of Concerned Scientists (UCS) supported all of the staff’s proposed revisions to RG 5.69. While acknowledging a lack of specific expertise on the backfit rule, UCS opined that if the changes were determined to be backfits, then the changes should be determined to be required for adequate protection.

In SECY-18-0110, “Proposed Revision to Regulatory Guide 5.69, “Guidance for the Application of the Radiological Sabotage Design-Basis Threat for Nuclear Power Reactors” (ADAMS Accession Number ML18186A446), dated November 2, 2018, the staff transmitted the proposed Revision 1 to RG 5.69 to the Commission. The staff incorporated 10 of the 14 proposed revisions into RG 5.69 Revision 1. One item was discontinued for consideration into this RG.

The staff is addressing the three remaining revisions on which alignment with industry was not reached when Revision 1 was transmitted to the Commission. A memorandum on these revisions was provided to the Commission on October 4, 2019 (ADAMS Accession No. ML19235A287).

## **Unmanned Aerial Systems (UASs) (NSIR)**

In November 2017, the NRC staff informed the Commission that the staff had begun assessing the threat of Unmanned Aerial Systems (UASs), formally known as Unmanned Aerial Vehicles and colloquially known as drones, as part of the NRC's Adversary Characteristics Screening Process (ACSP). The ACSP is a 5-step process that evaluates terrorist and criminal tactics, techniques, and procedures, including new technologies, to determine if the potential adversarial uses could pose a threat to NRC-licensed facilities. The term UAS covers a wide range of characteristics, such as type (fixed-wing, single rotor, or multi-rotor), size (measured in centimeters, up to the size of a small aircraft), and capabilities (flight range, flight endurance, carrying capacity, pre-programming flight paths, obstacle avoidance, etc.).

The Federal Aviation Administration (FAA) has the statutory responsibility for regulating the safe and secure use of the national airspace and aircraft using that space. The FAA has defined UASs as aircraft subject to the comprehensive regulatory regime developed by the FAA. Additionally, there are existing statutes that make it a criminal offense to interfere with, seize, or destroy an aircraft without proper authorization. Other statutes also make it unlawful to intercept, interfere with, or otherwise jam oral, electric, or wireless communication without proper authorization. These statutory restrictions limit some of the most effective methodologies that licensees could use to defend against UAS attacks. Since the FAA has defined UASs as aircraft, absent specific statutory authority federal agencies as well as private entities are prohibited from interfering with or interdicting the flight of UASs.

The staff recognizes that the differences in UAS characteristics can significantly affect the impact of potential adversary use of UASs NRC-licensed facilities. However, the limited resources of non-state-sponsored groups bound the sophistication and size of UASs available to them. These groups are generally limited to commercially available UASs (e.g., smaller than 2 meters in size). The technical analysis of the potential threats associated with UASs considered the differences in characteristics and adversary limitations.

In the fall of 2018 as part of Step 4 of the ACSP, the staff instituted a technical analysis of the potential threats posed by UASs to NRC-licensed facilities. This analysis took into account the differences in the characteristics of commercially available UASs, adversary limitations, and security characteristics of the NRC facilities. The technical analysis also included a study by Sandia National Laboratories (SNL) assessing the vulnerability of nuclear power plants and Category I fuel cycle facilities to adversary attacks utilizing UASs. The staff provided a paper to the Commission in October 2019, which includes the results of the SNL vulnerability study and the associated staff assessment. The staff concluded that there are currently no risk significant vulnerabilities at nuclear power plants or Category I fuel cycle facilities from adversarial use of commercially available UASs.

However, the staff acknowledges that the capabilities of UASs are continually changing, so the staff routinely engages with Federal and international partners to maintain ongoing awareness of evolving UAS technologies (interactions include staff-level meetings and conferences to management participation in nuclear security working groups).

In addition, the staff uses domestic UAS sighting reports voluntarily provided by licensee for trend analysis and to inform the NRC's threat assessment. Evaluating these reports over time enables the staff to track UAS activity around and over NRC-licensed facilities and to identify

any increases or decreases in UAS activity. The staff also assesses if there are site-specific or geographic groupings of UAS activity.

Currently, there is an FAA Notice to Airmen (4/08/11) which applies to UASs. It states:

In the interest of national security and to the extent practicable, pilots are strongly advised to avoid the airspace above, or in proximity to such sites as power plants (nuclear, hydro-electric, or coal), dams, refineries, industrial complexes, military facilities and other similar facilities. Pilots should not circle as to loiter in the vicinity over these types of facilities.

However, this is not enforceable by regulation, so the nuclear industry coordinated with the Department of Energy (DOE) to have DOE request the Federal Aviation Administration to designate the airspace over nuclear power plants as "restricted airspace." This would prohibit UASs from overflying these facilities without lawful cause and provide consistency in application, since local laws governing UAS technology vary from state to state. Although this measure would not impact NRC regulatory requirements, it could reduce innocent hobbyist overflights and provide a deterrent to some adversaries. Once approved, commercial UAS software will recognize the restriction and preclude flights above the designated area, even though this software could be disabled by the UAS operator.

## **Yucca Mountain / Nuclear Waste Fund (NMSS)**

In June 2008, the U.S. Department of Energy (DOE) submitted a license application seeking authorization to construct a geologic repository at Yucca Mountain. After docketing the DOE license application, the NRC staff began documenting its review in a Safety Evaluation Report (SER) and completed Volume 1 of the SER in August of 2010. In March 2010, DOE filed a motion to withdraw its application before the Atomic Safety and Licensing Board, which denied DOE's motion in June 2010. During this time period, Congress reduced funding for the NRC's review of the application, with no funds appropriated for Fiscal Year 2012 or beyond. On September 30, 2010, DOE's Office of Civilian Radioactive Waste Management ceased operations and assigned the remaining Yucca Mountain-related responsibilities, such as site closure, to other offices within DOE. In October 2010, the NRC staff began orderly closure of its Yucca Mountain activities. In September 2011, the Commission announced it was evenly divided on whether to overturn or uphold the Atomic Safety and Licensing Board's decision denying DOE's motion to withdraw its application. The Commission directed the Board, in recognition of budgetary limitations, to complete all necessary and appropriate case management activities, and the Atomic Safety and Licensing Board suspended the proceeding on September 30, 2011.

On August 13, 2013, a panel of the U.S. Court of Appeals for the District of Columbia Circuit issued its decision in the case *In re Aiken County* directing the NRC to "promptly continue with the legally mandated licensing process" for DOE's application to construct a geologic repository for high level waste at Yucca Mountain. The NRC promptly began taking steps to comply with the court's direction following the issuance of the decision. On November 18, 2013, the Commission approved a memorandum and order, which set a course of action for the Yucca Mountain licensing proceeding that was consistent with the Appeals Court decision and with the resources available. At the time of the decision, the NRC had a balance of \$13,549,315 of unexpended Nuclear Waste Fund (NWF) funding.

Based on Commission direction and with its remaining HLW funds: 1) the NRC staff completed the safety evaluation report (January 2015); 2) the NRC staff published a supplement to DOE's Environmental Impact Statement (EIS) (May 2016); 3) agency staff made the nearly 3.7 million documents formerly available on the Licensing Support Network (LSN) publicly available in ADAMS (August 2016); 4) the NRC staff conducted, after publication of the SER, knowledge management (KM) activities to document insights gained in select technical areas (November 2016 – September 2017); and 5) the agency conducted a virtual meeting of the LSN Advisory Review Panel to garner input from parties involved in the Yucca Mountain proceeding, interested stakeholders, and members of the public regarding possible system configurations should the proceeding be restarted (February 2018).

With respect to the safety evaluation report, the NRC staff concluded that it could not recommend issuance of a construction authorization at this time because DOE's application did not meet all of the applicable requirements, specifically those related to land use and water use. Additionally, a construction authorization could not be issued until an adjudicatory hearing has been conducted on contested issues, and the Commission has completed its review of contested and uncontested issues.

The NRC staff's SER, EIS, KM, and LSN-related work has expended most of the NRC's previous appropriations from the NWF for the licensing review. As of September 30, 2020, remaining NWF funds were \$425,599. The Commission approved a staff proposal to develop

further knowledge management documentation related to the staff's review of the Yucca Mountain high-level waste disposal application (SRM-COMSECY-20-0013: "Knowledge Management for High-Level Waste Disposal" (ADAMS Accession No. [ML20283A415](#))), signed by the acting Secretary, October 9, 2020). This staff activity will expend no more than \$164,000 from the NWF and will be completed within the next year.

## **External Engagements with Research Organizations (RES)**

In accordance with the provisions of the Atomic Energy Act of 1954, as amended, the Office of Nuclear Regulatory Research (RES) is authorized to enter into cooperative research agreements with external organizations, provided that such agreements do not represent a conflict of interest, or the appearance thereof, as it relates to the role of the NRC as an independent regulatory authority. The scope of external engagements includes the mutual sharing of information and data from research activities, the use of specialized testing facilities, jointly funding research studies, and staff exchanges.

RES has substantial engagements with other U.S. government agencies, the most extensive of which are with the Department of Energy (DOE), but also with the Department of Defense, National Aeronautics and Space Administration, and U.S. Geological Survey, among others. Given the breadth of collaboration between RES and DOE, the respective organizations maintain a Memorandum of Understanding (MOU) setting forth the commitments of the parties and the terms of permitted activities. Current priority areas for information exchange are advanced non-light water reactor (ANLWR) concepts, accident tolerant fuel (ATF), computer codes, and plant modernization for long-term operation of the existing fleet. The Nuclear Energy Innovation Capabilities Act (NEICA) has provisions directing collaboration between NRC and DOE to facilitate the design and eventual licensing of ANLWRs.

RES engagements with counterparts in the private nuclear industry are primarily directed through the Electric Power Research Institute (EPRI), which is an independent, non-profit research organization, of which many utilities and vendors are members. RES maintains a MOU with EPRI, similar in concept to that with DOE, and addressing many of the same technical areas, as well as others such as non-destructive examination (NDE) of reactor components, probabilistic risk assessment (PRA), and digital instrumentation and controls.

RES is also highly involved in coordinated research activities with international counterparts. Some of these are guided by bilateral agreements between RES and the international organization, such as recently implemented agreement with France's Institut de radioprotection et de sûreté nucléaire (IRSN) on NDE, while others are multinational projects, including those within the framework of the Organization for Economic Cooperation and Development, Nuclear Energy Agency (OECD NEA) Committee on the Safety of Nuclear Installations. Notably, RES has established international user groups for computer codes addressing thermal-hydraulic analysis, severe accident analysis and radiation protection with membership fees that are used to fund code development and enhancements. Recent focus has been placed on RES participation in the OECD NEA Halden Reactor Project, given the closure of the test reactor in Norway, which was anticipated to play a key role in studies related to the performance of ATF and the irradiation-induced degradation of reactor materials for long-term plant operation. RES is coordinating with DOE, EPRI, and other stakeholders to assess alternative facilities to the Halden reactor, both internationally and domestically. NEA is progressing in the development of the Multinational Framework for Irradiation Experiments (FIDES). The staff anticipates that FIDES would offer a means to continue the nuclear fuel and materials international collaborative research previously undertaken in the Halden Reactor Project and therefore staff in RES, NRR, and OIP are actively engaged with the NEA as they develop the FIDES framework.

Finally, RES seeks to leverage international expertise and support the global nuclear regulatory community by temporarily hosting foreign assignees for the purposes of training and knowledge exchange. In recent years, staff persons from regulatory authorities and technical support

organizations in Japan, Hungary, South Korea, Israel, Poland, and France worked together with RES staff on projects involving computer code development, radiation protection, materials performance, and PRA, among others.

### **Full-Scope Site Level 3 Probabilistic Risk Assessment (PRA) Project (RES)**

The NRC has pioneered the application of risk assessment techniques, including probabilistic risk assessment (PRA), in ensuring nuclear safety since the agency was established in 1975. The NRC uses PRA to estimate risk to determine what can go wrong, how likely is it, and what are its consequences. Thus, PRA provides insights into the strengths and weaknesses of the design and operation of a nuclear power plant. A Level 1 PRA estimates the frequency of accidents that cause damage to the nuclear reactor core (i.e., core damage frequency (CDF)). A Level 2 PRA starts with the Level 1 core damage accidents and estimates the frequency of accidents that release radioactivity from the nuclear power plant. A Level 3 PRA starts with the Level 2 radioactivity release accidents and estimates the consequences in terms of injury to the public and damage to the environment.

The full-scope site Level 3 PRA project includes the following objectives: (1) develop a Level 3 PRA, generally based on current state-of-practice methods, tools, and data that (a) reflects technical advances since completion of the NUREG-1150 studies and (b) addresses scope considerations that were not previously considered; (2) extract new risk insights to enhance regulatory decision-making and to help focus agency resources on issues most directly related to the agency's mission; (3) enhance PRA staff capability and expertise and improve documentation practices to make PRA information more accessible, retrievable, and understandable; and (4) obtain insight into the technical feasibility and cost of developing new Level 3 PRAs.

The scope of the Level 3 PRA project includes the major radiological sources onsite (i.e., both reactor units, both spent fuel pools, and dry cask storage), considered both individually and in terms of integrated site risk; all modes of reactor operation; and all internal and external hazards (excluding malevolent acts). The Level 3 PRA study is generally based on current state-of-practice methods, tools, and data and is only pursuing new research in a few limited cases (e.g., multi-unit risk and integrated site risk).

Information being used during the Level 3 PRA project was voluntarily provided by a licensee based on one of the nuclear power plants it is licensed to operate. This reference plant design is a two-unit Westinghouse four-loop pressurized-water reactor (PWR) with large dry pre-stressed post-tensioned containment structures. The information the licensee provided reflects the two-unit plant as it was designed and operated as of 2012 and does not reflect the plant as it is currently designed, licensed, operated, or maintained. The Level 3 PRA project team is leveraging the existing and available information for the reference plant and the associated licensee PRAs, in addition to related research efforts to enhance efficiency in performing the study.

The Level 3 PRA project team is using the following NRC tools for performing the Level 3 PRA study:

- Systems Analysis Programs for Hands-on Integrated Reliability Evaluation (SAPHIRE), Version 8, which is the NRC's standard software application for performing PRAs.
- MELCOR Severe Accident Analysis Code, for modeling the progression of postulated accidents in both light-water reactors and in non-reactor systems.

- MELCOR Accident Consequence Code System (MACCS), for evaluating the public health effects and economic costs of mitigation actions for severe accidents at diverse reactor and non-reactor facilities.

Final proprietary reports on reactor, at-power, PRA models for internal events and internal floods (Levels 1, 2, and 3), internal fires (Level 1), seismic events (Level 1), high winds (Level 1), and “other hazards” have been completed, with several of these being subjected to a peer review based on the American Society of Mechanical Engineers/American Nuclear Society PRA standards. Draft public versions of the reports on (1) the project background and approach (2) the reactor, at-power, Level 1 PRA for internal events, and (3) the reactor, at-power, Level 2 PRA model for internal events and floods have been prepared. Steps are being taken to account for advances in risk assessment methods (e.g., fire PRA realism), new operational practices (e.g., implementation of mitigating strategies using FLEX equipment), and improved plant designs (e.g., advanced reactor coolant pump seals) since the Level 3 PRA Project plant design was frozen as of 2012. Also, the final proprietary reports on the reactor, low power and shutdown PRA model for internal events (Level 1), and a combined Levels 1-3 PRA for dry cask storage are nearing completion. The current schedule is to complete all project technical work by the end of FY 2021, with the completion of project documentation in FY 2022.

While the project is not yet complete, some of the project work is already being leveraged. For example, the initial results of the study are supporting a future-focused research activity on the licensing modernization project. In addition, the Level 3 PRA project MELCOR input model is being used to support a Phenomena Identification and Ranking Table (PIRT) panel on the importance of various parameters in MELCOR’s fuel degradation models for Accident Tolerant and High Burnup fuels.

## **Fire Safety Research (RES)**

On March 22, 1975, there was a fire at the Tennessee Valley Authority (TVA) Browns Ferry Nuclear Plant (BFN). Additionally, the results of the Individual Plant Examination of External Events (IPEEE) program conducted in the 1990s, along with continuing fire events, demonstrate that fire can be a significant contributor to nuclear power plant (NPP) risk. In particular, these results and events show that failures of fire protection defense-in-depth features can lead to risk-significant conditions. Following the BFN fire, the NRC required fire protection programs in U.S. NPPs to use the concept of defense-in-depth to achieve the required degree of fire safety by using echelons of protection from fire effects. The three echelons for fire protection are (1) prevent the fire from starting; (2) rapidly detect, control, and promptly extinguish those fires that do occur; and (3) protect structures, systems, and components important to safety so that a fire not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.

To address these lessons-learned about NPP fire risk, the Office of Nuclear Regulatory Research (RES) plans, develops, and manages the safety- and risk-related Fire Research Program for the NRC. Through this state-of-the-art program, RES supports other NRC offices by developing and validating fire analysis methodologies and supporting data. These methodologies, which include fire probabilistic risk assessment (PRA), fire human reliability analysis (HRA), and mathematical fire modeling, provide a structured, integrated approach to evaluate the impact of failure in the fire protection defense-in-depth strategy on safety. The staff then uses the results of its research activities as the basis for recommending improvements in NRC programs and/or processes to risk-inform regulations and achieve the desired outcomes of enhanced safety, efficiency, and effectiveness.

For example, in 2004, the NRC amended its fire protection requirement to allow existing reactor licensees to voluntarily adopt the risk-informed, performance-based requirements in 10 CFR 50.48(c). This rule endorses National Fire Protection Association Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," as an alternative to the existing prescriptive fire protection requirements. The RES staff is actively involved in developing the state-of-the-art methods, tools, data, and technical information required to implement these new requirements. Many of the fire research programs are performed in partnership with the Electric Power Research Institute (EPRI) working under a Memorandum of Understanding (MOU) to advance the understanding of fire risk. Most recently working under the MOU, EPRI and RES have completed a series of reports that provide methods and data that better represent plant operating experience, thus enhancing the realism of fire PRAs.

The RES staff performs a variety of activities to establish a solid foundation for the agency's fire safety research and to support other NRC offices. The RES staff provides unique, specialized training in the application of fire PRA for the NRC Fire Inspection qualification program. Moreover, the RES staff also supports the NRC's knowledge management (KM) initiative by training other NRC staff and by identifying and documenting relevant information.

Currently, RES staff are conducting research to characterize the High Energy Arching Fault (HEAF) hazard presented by faults occurring in electrical equipment containing aluminum. This issue is currently being evaluated under the NRC's Generic Issue (GI) program as Pre-GI-018. RES has also issued Information Notice 17-04 to inform licensee about the operating experience and NRC testing results pertaining to the magnitude of arc fault hazard in electrical

equipment containing aluminum. The NRC has formed a joint working group with EPRI to research and better understand the risk implications of HEAFs involving aluminum. RES is also in the process of completing a HEAF project plan and publishing it on the NRC web site to keep all interested stakeholder up to date on the progress of this program.

In addition, the RES staff works with both national and international fire research entities to assess and improve the agency's fire research program and to maintain a high level of expertise in the field. This work and cooperation provide a robust infrastructure for NPP fire research. RES staff support the International Fire Events Data Base project, the PRISME (French acronym for "Fire Propagation in Elementary Multi-Room Scenarios") Fire Modeling Advancement program, and the NRC-led High Energy Arcing Faults research, working in conjunction with 10 other member countries under the Nuclear Energy Agency (NEA) of the Organisation for Economic Cooperation and Development (OECD).

## **State-of-the-Art Reactor Consequence Analyses (SOARCA) (RES)**

The NRC initiated the State-of-the-Art Reactor Consequence Analyses (SOARCA) project to develop best-estimates of the offsite radiological health consequences for potential severe reactor accidents. SOARCA aimed to assess the benefits of the mitigation measures required by 10 CFR 50.54(hh) that were put in place after the terrorist attacks of September 11, 2001, for responding to fires and explosions in other accident scenarios.

The original SOARCA project modeled select severe accident scenarios in a representative pressurized-water reactor with a large dry containment (Surry) and a boiling-water reactor with Mark I containment (Peach Bottom). Selected accidents included station blackout scenarios for both plants and containment bypass scenarios for Surry. The selected scenarios were run twice, first assuming the event proceeds without mitigation measures required by 10 CFR 50.54(hh) followed by a case where mitigation strategies were successful. This method provided an indication of the benefit of the mitigation strategy. The NRC staff subsequently evaluated a more limited set of station blackout scenarios at a third pressurized-water reactor (Sequoyah) with ice condenser containment. The focus of this third plant analysis was to determine if any additional insights are available for a smaller ice condenser containment including risks associated with hydrogen generation during severe accidents.

The staff also conducted an uncertainty analysis (UA) of one of the accident scenarios for each of the three plants. The goals of these UAs were to (1) develop insights into the overall sensitivity of SOARCA results to uncertainty in model input parameters, (2) identify the most influential input parameters for releases and consequences, and (3) demonstrate an UA methodology that could be used in future source term, consequence, and site Level 3 probabilistic risk assessment studies.

The first part of the SOARCA project is documented in a series of NUREG reports—NUREG-1935 and NUREG/CR-7110 Volumes 1 (Peach Bottom) and 2 (Surry), Revision 1. The Sequoyah analyses and the uncertainty analysis for Peach Bottom are documented respectively in NUREG/CR-7245 and NUREG/CR-7155. Staff has completed the final Surry Uncertainty Analysis and is currently preparing the report for NRC's NUREG publications process. Staff is also developing a consolidated summary report of useful insights from the three SOARCA UAs (for Peach Bottom, Surry, and Sequoyah) which will be an important reference for various NRC applications including cost-benefit and regulatory guidance documents.

The SOARCA project's main findings fall into three basic areas: how a reactor accident progresses; how existing systems and emergency measures can affect an accident's outcome; and how an accident would affect public health. The 2012 project findings, corroborated by subsequent uncertainty analyses and the Sequoyah analyses, include:

- Existing resources and procedures can stop an accident, slow it down or reduce its impact before it can affect public health, if successfully implemented;
- Even if accidents proceed without successful intervention, they generally take longer to happen and release less radioactive material within the simulation time than earlier analyses suggested. Hence some accidents that may have been traditionally classified as large-early release scenarios (e.g., interfacing-systems loss-of-coolant-accident for Surry) may no longer contribute to large-early-release frequency because release is delayed beyond the time assumed to successfully evacuate the close-in population;

- The analyzed accidents pose “essentially zero” risk of early death (from radiological consequences) and only a very, very small increase in the risk of a long-term cancer death to a member of the public; and
- The small calculated individual cancer fatality risk is dominated by accumulation of very small doses to the public in the affected area, below allowable habitability criteria, in the long-term. Longer-term cancer-fatality risks for the accident scenarios analyzed are millions of times lower than the general U.S. cancer fatality risk from all causes.

The SOARCA analyses of the three pilot plants have been useful in many ways beyond their original objectives. The SOARCA project’s results, insights, computer code models, and modeling best practices have supported NRC rulemaking, licensing, and oversight efforts as well as facilitated international cooperation and knowledge management. Additionally, the process of conducting such detailed analyses has developed staff expertise in a variety of important technical areas including severe accident progression, environmental source terms, atmospheric transport and dispersion, offsite consequence analysis, emergency preparedness and response, dosimetry, health effects, uncertainty analysis, and risk communication. The study also resulted in improvements in NRC analytical tools and associated severe accident analysis methodologies, including parametric uncertainty analysis. Staff has published a Research Information Letter to document and explain the diverse and important uses of SOARCA results, insights, computer code models, and modeling best practices.

## **Rulemaking Processes (NMSS)**

### **Planned Rulemaking Activities**

As of October 27, 2020, the NRC is working on a total of 83 rulemaking activities. Of these, 63 are planned rulemaking activities and 20 are petitions for rulemaking that the NRC is reviewing. The 63 planned rulemaking activities include 8 rulemakings in response to industry requests, 17 rulemakings that could reduce or clarify existing requirements, 22 rulemakings to comply with congressional statutes or conform NRC regulations to other agency requirements or international treaties or agreements, and 16 rulemakings that could establish new requirements. The NRC uses a single tracking and reporting system to provide updates on all NRC rulemaking and petition for rulemaking activities. Members of the public can access the NRC's rulemaking activity information on the NRC's website. An internal view of the same system allows staff to view projected resources for budgeted rules. Attachment 1 to this document lists all 83 rulemaking and petition for rulemaking activities, including their priorities.

### **Common Prioritization of Rulemaking**

Rulemaking actions are prioritized under the oversight of the Executive Director for Operations and in coordination with program offices across the agency. Each year the staff reviews all new and ongoing rulemaking activities and creates an integrated prioritization list of all NRC rulemakings. This is known as the Common Prioritization of Rulemaking (CPR) process. This prioritization process establishes agency rulemaking priorities across all disciplines using an established methodology with set criteria. These criteria allow staff to rank each rulemaking activity against the NRC's Strategic Plan goals of ensuring the safe and secure use of radioactive materials, the application of the Principles of Good Regulation in the conduct of regulatory activities, and the level of governmental and public interest in the rulemaking activity. Staff initiates a rulemaking activity and includes it in the CPR as directed by the Commission in the February 3, 2016, SRM for SECY-15-0129, "Commission Involvement in Early Stages of Rulemaking" (ADAMS Accession No. [ML16034A441](#)).

In June of each year, to coincide with the Commission's review of the agency's budget, the staff provides the Commission a detailed Annual Rulemaking Report (ARR) containing the status and priority of each rulemaking and the status of each petition for rulemaking activity.

### **Early Commission Involvement in the Rulemaking Process**

In accordance with Commission direction, the staff must submit a rulemaking plan for Commission review and approval before beginning rulemaking activities, with certain exceptions. For example, certain rulemaking actions delegated to the Executive Director for Operations and the Chief Financial Officer do not require a rulemaking plan; these rulemakings generally do not involve issues of policy. Examples of these delegated activities include the annual revision of fee schedules, amendments to the list of spent fuel storage casks, recurring rules to incorporate industry codes and standards into 10 CFR 50.55a, and purely administrative updates and corrective changes to the regulations. Management Directive 6.3, "The Rulemaking Process" (ADAMS Accession No. ML19211D136), dated July 3, 2019, describes the process for initiating and conducting rulemaking, and captures the relevant delegations of authority for issuing rules.

### **Cumulative Effects of Regulation (CER) (NMSS)**

The NRC's Cumulative Effects of Regulation (CER) activities are an ongoing effort to increase the effectiveness and efficiency with which the agency implements regulatory actions by considering the cumulative impact of regulatory activities on entities. The staff continues to conduct its essential regulatory activities that provide for adequate protection of public health and safety while evaluating CER considerations for other matters.

The CER approach recognizes the challenges that licensees and other impacted entities (such as State partners) face when implementing new regulatory positions, programs, or requirements (e.g., rules, generic letters, backfits). It can be difficult to implement multiple complex regulatory positions, programs, or requirements within a specified time period and with potentially limited resources (e.g., expertise to address a specific issue). If CER is not considered carefully, regulatory activities could potentially distract from primary duties that ensure safety or security.

Since 2011, the NRC staff has implemented several rulemaking procedure enhancements related to CER, including: 1) increased stakeholder interactions early in and throughout the regulatory process, 2) publishing supporting guidance concurrent with rules both at the proposed and final rule stages, 3) requesting specific comment on CER to enable that feedback to be considered in the regulatory process, and 4) developing informed implementation timeframes that reflect CER feedback.

The staff also conducts specific CER public meetings on the implementation schedule for each final rule. Public meetings are held biannually or more frequently between the Division of Fuel Management, the Nuclear Energy Institute, members of the industry, and stakeholders, so that the NRC staff can work with stakeholders and the industry to address CER issues. The staff summarizes the current major regulatory activities, the major milestones, dates for meetings and public interactions, and other information in a Gantt Chart entitled "[Integrated Schedule of Regulatory Activities for Fuel Cycle](#)" (ADAMS Accession No. ML20201A012). The goal is to more effectively coordinate rulemaking and other regulatory efforts to avoid scheduling conflicts and to focus the work on important regulatory projects.

## **Regulatory Analysis, Backfitting, and Use of Qualitative Factors in Agency Rulemaking (NMSS)**

### **Regulatory Analysis**

A regulatory analysis is an analytical tool used by NRC decision-makers to assist in determining whether the NRC should implement a proposed regulatory action. A regulatory analysis contains estimates of the benefits and costs of the proposed agency action, together with a conclusion as to whether the proposed action is cost-beneficial. “Cost-beneficial” means that the benefits of the proposed action are equal to, or exceed, the costs of the proposed action.

The regulatory analysis focuses on identifying reasonable alternatives that have a high likelihood of resolving the problems and concerns. The “no-action” alternative normally serves as the base case for analysis. The staff then evaluates the costs and benefits of the alternatives, expressing them in quantified monetary terms whenever possible.

NRC procedures require that a regulatory analysis be prepared for all actions that involve “backfits” and impose generic requirements. Although the decision criterion for a regulatory analysis is different from that for a backfit analysis (as described below), a complete regulatory analysis will provide all information necessary to address the backfit analysis considerations.

### **Backfit Analysis**

The staff determines whether the proposed NRC action constitutes “backfitting,” as defined in 10 CFR 50.109(a)(1),<sup>1</sup> for power reactors licensed under 10 CFR Part 50. Similar “issue finality” provisions apply to power reactor approvals issued under 10 CFR Part 52. Backfitting provisions for certain materials licensees are included in 10 CFR 70.76, 10 CFR 72.62, and 10 CFR 76.76. If the proposal constitutes a backfit, then the staff must prepare a backfit analysis, unless the staff determines that one or more exceptions to the requirement for a backfit analysis apply. Section 50.109(a)(4) provides that a backfit analysis is not required if the action is necessary for adequate protection, involves defining or redefining what is needed for adequate protection, or is necessary for compliance. Adequate protection considerations are considered before proceeding to other steps of the backfitting process.

Unless one of the exceptions in § 50.109(a)(4) applies, a backfit analysis is required by NRC regulations to support a determination that a backfit should be adopted for certain licensees under certain circumstances. The decision criterion in a backfit analysis is whether the proposed backfit is a “substantial increase” in protection to public health and safety or common defense and security and whether the costs of the proposed backfit are justified by the substantial increase benefit. Thus, the backfit analysis decision criterion differs from the regulatory analysis decision criterion in that a “substantial increase” in protection of public health and safety or common defense and security is first needed to justify the proposed backfit, rather than being only cost-beneficial.

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<sup>1</sup> Backfitting is defined as a modification of or addition to systems, structures, components, or design of a facility; or the design approval or manufacturing license for a facility; or the procedures or organization required to design, construct, or operate a facility, any of which may result from a new or amended provision in the Commission rules or the imposition of a regulatory staff position that is either new or different, from a previously applicable staff position.

Recently, the agency revised and updated its policy and guidance documents to reflect lessons-learned from recent backfits and recent Commission direction. These documents include Management Directive 8.4, “Management of Backfitting, Forward Fitting, Issue Finality, and Information Requests,” (ADAMS Accession No. ML18093B087) issued on September 20, 2019, and a draft revision to NUREG-1409, “Backfitting Guidelines,” (ADAMS Accession No. ML18109A498) issued on March 2020. These activities also included conducting staff training in 2017 and 2018, and establishing knowledge management on topics associated with backfitting and issue finality. Additional training will be conducted after the update to NUREG-1409 has been finalized.

### **Use of Qualitative Factors**

The NRC staff considers many factors when preparing regulatory analyses and backfit analyses. The NRC uses qualitative factors in a judicious and disciplined manner to inform decision making, in limited cases, when quantitative analyses are not possible or practical due to lack of methodologies or data. The NRC’s judicious use of qualitative considerations is consistent with other Federal and international agencies’ practices. In particular, the Office of Management and Budget has published regulatory guidance<sup>2</sup> highlighting that a “good regulatory analysis” includes both qualitative and quantitative considerations.

Qualitative factors were a consideration in the staff’s recommendation to add engineered filters to boiling-water reactors (BWR) with Mark I and Mark II reactor containment venting systems, as described in SECY-12-0157, “Consideration of Additional Requirements for Containment Venting Systems for Boiling Water Reactors with Mark I and Mark II Containments” (ADAMS Accession No. ML12326A370). As part of its SRM dated March 19, 2013 (ADAMS Accession No. ML13078A017), the Commission directed the staff to seek detailed Commission guidance regarding the use of qualitative factors. In response, the staff submitted SECY-14-0087, “Qualitative Consideration of Factors in the Development of Regulatory Analyses and Backfit Analyses,” dated August 14, 2014 (ADAMS Accession No. ML14127A451). In the SRM for SECY-14-0087, dated March 4, 2015 (ADAMS Accession No. ML15063A568), the Commission approved the staff’s plan to update guidance regarding the use of qualitative factors and improve the clarity, transparency, and consistency of the agency’s regulatory analyses and backfit analyses. The Commission also provided high-level principles to which the guidance should adhere.

The staff sought public input to inform the development of guidance on how to consider qualitative factors for a given regulatory action, particularly when these factors are compared with the quantitative costs of the action. On March 3, 2016, the staff held a public workshop on the proposed changes to the cost-benefit guidance, including the use of qualitative factors, uncertainty, and cost estimating. The Commission is currently reviewing this guidance in SECY-20-0008 (ADAMS Accession No. ML19261A277).

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<sup>2</sup> U.S. Office of Management and Budget (OMB). “Regulatory Analysis.” Circular No. A 4. September 17, 2003. Accessible at [https://www.whitehouse.gov/omb/circulars\\_a004\\_a-4/](https://www.whitehouse.gov/omb/circulars_a004_a-4/).

### **Improving Cost Estimating for Implementing New Regulations (NMSS)**

The NRC staff is updating the content and structure of its cost-benefit guidance documents to improve the NRC's process for developing cost estimates for implementing proposed requirements. This update to NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," addresses relevant best practices provided by the U.S. General Accountability Office (GAO) and is informed by input from licensees, the Nuclear Energy Institute, and other stakeholders. The update consolidates guidance documents; incorporates recommendations from the GAO's report on the NRC's cost-estimating practices and cost-estimating best practices from the GAO's guide; and addresses the use of uncertainty in regulatory analysis.

In accordance with Commission direction in the SRM for SECY-14-0087, the updated guidance also contains best practices for the consideration of qualitative factors. Staff provided the updated guidance to the Commission in [SECY-18-0042: Draft Final NUREG/BR-0058, Revision 5, "Regulatory Analysis Guidelines of the U.S Nuclear Regulatory Commission"](#) (ADAMS Accession No. ML17221A000). In the SRM for SECY-18-0042, dated July 26, 2019, (ADAMS Accession No. ML19207A042), the Commission returned the paper to the staff and directed the staff conform NUREG/BR-0058 to MD 8.4 and return it to the Commission for review and approval. The staff sent the revised NUREG/BR-0058 to the Commission on January 28, 2020, in SECY-20-0008 (ADAMS Accession No. [ML19261A277](#)). Following Commission review and approval, the staff will issue NUREG/BR-0058.

## **Power Reactor Decommissioning Rulemaking (NMSS)**

The power reactor licensees that are in the process of transitioning from operations to decommissioning have routinely requested exemptions from the following requirements, based on the fewer types of potential accidents and reduced risk of radiological releases at decommissioning reactors as compared to operating reactors: emergency preparedness, decommissioning financial assurance, onsite and offsite insurance, and site-specific security. In the SRM for SECY-14-0118, "Request by Duke Energy Florida, Inc., for Exemptions from Certain Emergency Planning Requirements," dated December 30, 2014 (ADAMS Accession No. ML14364A111), the Commission directed the staff to proceed with rulemaking on reactor decommissioning while continuing to process current and pending applications for decommissioning amendments and exemptions until that regulatory work is complete. In addition, the Commission provided the staff with an initial scope for the power reactor decommissioning rulemaking, including a graded approach to emergency preparedness, lessons learned from the plants that have already gone or are currently going through the decommissioning process, the advisability of requiring a licensee to obtain NRC approval for its post-shutdown decommissioning activities report, the appropriateness of maintaining the three existing options for decommissioning and the timeframes associated with those options, the appropriate role of State and local governments and nongovernmental stakeholders in the decommissioning process, and any other issues that the NRC staff considers relevant.

The staff provided the draft proposed rule to the Commission for review and approval in May 2018 (SECY-18-0055, "Proposed Rule: Regulatory Improvements for Production and Utilization Facilities Transitioning to Decommissioning (RIN 3150-AJ59)" (ADAMS Accession No. ML18012A019). The draft proposed rule would amend regulations related to the decommissioning of production and utilization facilities by adopting a graded approach in several areas that is commensurate with the reductions in radiological risk at four levels of decommissioning: (1) permanent cessation of operations and removal of all fuel from the reactor vessel, (2) sufficient decay of fuel in the spent fuel pool such that it would not reach ignition temperature within 10 hours under adiabatic heat up conditions, (3) transfer of all fuel to dry storage, and (4) removal of all fuel from the site. The draft proposed rule addressed several regulatory areas, including emergency preparedness, physical security, cyber security, decommissioning funding assurance, and drug and alcohol testing. The draft proposed rule is currently with the Commission for approval.

**Emergency Preparedness for Small Modular Reactors and Other New Technologies Rulemaking (NMSS)**

Consistent with the Commission's direction in 2015 (SRM SECY 15-0077, ADAMS Accession No. ML15216A492), the NRC staff developed a proposed rule that would provide licensees and applicants the option to use alternative emergency preparedness requirements for small modular reactors and other new technologies. The proposed alternative emergency preparedness requirements would adopt a consequence-oriented, risk-informed, and performance-based approach. In part, this rulemaking would reduce potential requests for exemptions from the current emergency preparedness requirements and promote regulatory stability, predictability, and clarity in the licensing process for these future facilities. The NRC published the regulatory basis on November 15, 2017. The NRC staff provided the proposed rule to the Commission for its consideration in SECY-18-0103 on October 12, 2018 (ADAMS Accession No. ML18134A086). The SRM for SECY-18-0103 was issued on December 17, 2019 (ADAMS Accession No. ML19351C729).

On May 12, 2020, the NRC published a proposed rule for public comment in the *Federal Register* (92 FR 28436) to revise its emergency preparedness requirements for small modular reactors and other new technologies such as advanced reactors. On July 21, 2020, the public comment period on the proposed rule was extended from July 27, 2020, to September 25, 2020, to allow more time for members of the public and other stakeholders to develop and submit their comments. The NRC staff also briefed members of the Federal Radiological Preparedness Coordinating Committee (FRPCC) to provide technical details on the proposed rule in June 2020. The proposed rule was out for public comment at the time and the briefing supported the FRPCC in providing comments on the proposed rulemaking activity.

## **Part 50/52 Clean-Up Rule – Alignment of Licensing Processes and Lessons Learned from New Reactor Licensing (NRR)**

### **Background and Purpose of Rulemaking**

NRC staff is working on a rulemaking effort to address the alignment of licensing requirements of Title 10 of the *Code of Federal Regulations* (CFR) Part 50, “Domestic Licensing of Production and Utilization Facilities,” and 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants.” The Commission directed the NRC staff to also pursue rulemaking to incorporate lessons learned from recent new power reactor licensing reviews. This rulemaking will help ensure consistency in new reactor licensing reviews, regardless of the licensing process an applicant chooses to use.

Alignment between 10 CFR Part 50 and Part 52 is merited because new reactor licensing and guidance development activities have, for many years, focused on the licensing processes and updates to 10 CFR Part 52 rather than those in 10 CFR Part 50. Some Commission decisions regarding new reactor licensing issues have been incorporated into 10 CFR Part 52, without similar requirements consistently being incorporated into 10 CFR Part 50. For example, 10 CFR Part 52 includes requirements derived from the Commission’s “Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants,” with explicit requirements related to the Three Mile Island (TMI) items in 10 CFR 50.34(f), severe accidents, probabilistic risk assessment (PRA), and other topics, without similar requirements being incorporated for new 10 CFR Part 50 power reactor applications. Therefore, the staff is working to align Parts 50 and 52 so that policies and requirements apply to all new power reactor applications, regardless of the selected licensing approach. The alignment between Parts 50 and 52 is to ensure that equivalent designs submitted for NRC review under either process are assessed against consistent technical standards that yield outcomes with equivalent demonstrations of adequate safety, security, and environmental protection. Guidance updates for some rule changes will also be needed to ensure alignment of technical positions for review of new reactor applications.

### **Commission Direction on Rulemaking**

In a September 22, 2015, staff requirements memorandum (SRM) (ADAMS Accession No. ML15266A023) associated with SECY-15-0002, “Proposed Updates of Licensing Policies, Rules and Guidance for Future New Reactor Applications,” dated January 8, 2015 (ADAMS Accession No. ML13277A420), the Commission directed the NRC staff to proceed with a rulemaking on the alignment of licensing requirements of 10 CFR Part 50 and 10 CFR Part 52. The Commission directed the NRC staff to also pursue rulemaking to incorporate lessons learned from recent new power reactor licensing reviews.

Enclosure 1 to SECY-15-0002 (ADAMS Accession No. ML13277A647) identified Commission policies that the staff proposed to apply to new 10 CFR Part 50 power reactor license applications in a manner consistent with 10 CFR Part 52 license reviews, plus the regulations that the staff had recommended be modified in 10 CFR Part 50 to align with 10 CFR Part 52. In the SRM to SECY-15-0002, the Commission approved revision of the regulations in 10 CFR Parts 50 and 52 incorporating the policies identified by the staff in Enclosure 1. Enclosure 2 to SECY-15-0002 (ADAMS Accession No. ML13277A652) provided several examples of corrections and clarifications that should be made to 10 CFR Part 52, and recommended new requirements for 10 CFR Part 52. These corrections, clarifications, and new requirements were

lessons learned primarily as a result of 10 CFR Part 52 licensing reviews conducted by the NRC staff since 2007.

### **NRC Staff Rulemaking Activities and Rulemaking Status**

As part of the initial rulemaking effort, NRC staff has engaged in multiple public outreach efforts with external stakeholders on the scope of the rulemaking, on rulemaking status updates, and to provide responses to public questions. Based on initial public engagement and stakeholder input, NRC staff issued Information Paper SECY-19-0084, “Status of Rulemaking to Align Licensing Processes and Lessons Learned from New Reactor Licensing (RIN 3150-AI66)” (ADAMS Accession No. ML19023A046). This paper provided information to the Commission about the status and scope of the regulatory basis. The paper described the scope as four alignment items and 52 lessons learned items that the staff planned to evaluate in the regulatory basis.

The NRC staff also met with individual members of the Subcommittee on Regulatory Policies and Practices of the Advisory Committee on Reactor Safeguards (ACRS) on September 20, 2019. The purpose of the meeting was to receive the ACRS members’ observations of the implementation of the 10 CFR Part 52 processes based on their individual perspectives from their reviews of early site permit, design certification, and combined license applications. A transcript of this public meeting can be found in ADAMS under Accession No. ML19294A009.

The NRC staff recently completed a draft regulatory basis for comment (RBFC) document in support of the rulemaking effort. The final RBFC is expected to be issued for public comment in the first quarter of fiscal year 2021. A regulatory basis provides a sound foundation for informed decision-making throughout the rulemaking process and describes the technical, legal and policy issues and the staff’s consideration of options to resolve the issues. A cost/benefit analysis of options was also developed as part of the RBFC. In the RBFC, the NRC staff established a sufficient regulatory basis to continue with rulemaking in the following areas:

- Applying the Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants to New 10 CFR Part 50 License Applications
- PRA requirements
- TMI Requirements
- Description of Fire Protection Design Features and Description of Fire Protection Plans
- Operator Licensing
- Physical Security
- Fitness for Duty
- Emergency Planning
- Alignment of the 10 CFR Parts 50 and 52 Licensing Processes
- Environmental Review

### **Next Steps (Public Schedule)**

The next steps of this rulemaking effort are summarized in the table below:

<b>Activity</b>	<b>Public Milestone</b>
Complete concurrence on the regulatory basis package	November 2020
Issue the regulatory basis for public comment	December 2020
Public comment period ends	February 2021

NRC staff commence drafting the proposed rule	February 2021
Issue proposed rule for public comment	October 2022
Issue final rule	November 2024

**Part 53 Rule - Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors (NMSS)**

The Nuclear Energy Innovation and Modernization Act (NEIMA) requires that the NRC complete a rulemaking, by December 31, 2027, to establish a technology-inclusive regulatory framework for optional use by commercial advanced nuclear reactor applicants when they submit new license applications. In April 2020, the staff issued SECY-20-0032, Rulemaking Plan on “Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors” (ADAMS Accession No. ML19340A047). The rulemaking plan is currently with the Commission for approval. On May 14, 2020, the Senate Committee on Environment and Public Works sent a letter to the NRC Chairman (ADAMS Accession No. ML20154C196) on the Advanced Reactor Part 53 Rulemaking encouraging the NRC to accelerate the development of the technology-inclusive regulatory framework prior to the statutory deadline. The NRC responded in a June 2020 letter (ADAMS Accession No. ML20155K912) and stated that the Commission will provide direction to the staff on the proposed approach and schedule. The NRC staff plans to have extensive public outreach activities related to this rulemaking, including ongoing interactions with the Advisory Committee on Reactor Safeguards and planned public meetings.

### **Enhanced Weapons Rulemaking (NMSS)**

This rulemaking would amend the NRC's regulations to implement the authority in Section 161A of the Atomic Energy Act of 1954, as amended. Section 161A authorizes the Commission to designate those classes of licensees eligible to apply for permission to use certain firearms, weapons, ammunition, or devices, notwithstanding local, State, and certain Federal firearms laws and regulations prohibiting such use. These firearms may include enhanced weapons.

The rulemaking would adopt a graded approach that revises the requirements for physical security event notifications and adds two new notification requirements associated with imminent or actual hostile acts and the possession of enhanced weapons. Also, the rule reorganizes existing physical security event notification requirements into several timeliness categories. Additionally, the rule would add requirements for reporting suspicious activities to law enforcement agencies and the NRC. This rulemaking would affect multiple categories of reactor and material facility licensees.

The draft final rule was provided to the Commission on May 22, 2018. The staff revised the rule and supplemented the rule package on February 4, 2020 (ADAMS Accession No. ML16264A000). The staff modified the rule to (1) exempt certain Agreement State and NRC licensees possessing strategic special nuclear material of low strategic significance from the requirements for reporting suspicious activities; (2) revise and clarify the applicability of the physical security event notification and recordkeeping requirements; and (3) to clarify the rule text for access to enhanced weapons and the use of the term "non-power production or utilization facility." The rule is currently with the Commission for approval.

## **Advanced Reactor Physical Security Rulemaking (NMSS)**

On November 19, 2018, the Commission issued a staff requirements memorandum to SECY-18-0076, "Options and Recommendation for Physical Security for Advanced Reactors" approving the NRC staff's recommendation to initiate a limited-scope rulemaking to address certain physical security requirements for advanced reactors. The objective of the rulemaking is to establish alternative physical security requirements for certain existing security requirements in 10 CFR 73.55 that may not be appropriate for advanced reactors given their unique design features. These alternative physical security requirements should be commensurate with the potential consequences to public health and safety and common defense and security from the possession and use of special nuclear material at these facilities. The Commission further directed that this limited scope rulemaking should not develop a new regulatory framework for advanced reactors.

The NRC staff published a regulatory basis supporting this rulemaking for public comment in July 2019 (ADAMS Accession No. ML19099A006). The regulatory basis documents the staff's rationale for the rulemaking and solicited ideas from members of the public on possible security alternatives and performance criteria for advanced nuclear reactors. The staff received nine comment submissions on the regulatory basis.

Additionally, the staff has held four public meetings on the rulemaking. In advance of the April 2020 public meeting, preliminary proposed rule language and draft implementation guidance submitted by the Nuclear Energy Institute (NEI) were made publicly available to inform discussion at the meeting. The preliminary proposed rule language sets forth four alternative security requirements for certain existing physical security requirements found in 10 CFR 73.55 that in their current format may not be appropriate for all advanced reactors. The preliminary proposed rule language also set forth eligibility criteria that must be met before an advanced reactor licensee may use one or more of the alternative security requirements proposed in the rule.

The staff is currently drafting the proposed rule package, including revisions to the preliminary proposed rule language, in response to public comments received in response to the December 2019 and April 2020 public meetings. On May 26, 2020, NEI sent a letter outlining their concerns with the preliminary proposed rule language. NEI argues that any proposed rule applicable to advanced reactors should allow for zero licensee onsite armed responders and allow offsite law enforcement to fulfill the interdict and neutralize capability requirements. NEI also clarified that, in its opinion, an eligible advanced reactor licensee should retain the capabilities to detect, assess, and notify local law enforcement in response to a contingency event at the licensee's facility. In response to NEI's concerns, the staff revised the preliminary proposed rule language made available prior to the April 2020 public meeting. On September 17, 2020 the staff issued a letter in response to NEI's letter. The response letter references the staff's revised preliminary proposed rule language that was published in the *Federal Register* on September 14, 2020 (85 FR 56548).

In addition, the staff is reviewing the draft implementation guidance submitted by NEI, particularly NEI's discussion related to the performance (eligibility) criteria set forth in the preliminary proposed rule language. The staff is drafting new regulatory guidance (DG-1365) for implementing proposed alternative security requirements to accompany the proposed rule. The proposed rule is due to the Commission in January 2021.

### **Requests for Additional Information (RAIs) (NRR)**

During its review of a licensee's submittal (e.g., license amendment request, exemption) the NRC staff may need additional information to make a determination regarding the technical adequacy of the licensee's request. To obtain this information, the NRC staff will issue a request for additional information (RAI) to the licensee. As stated in 10 CFR 2.102, "During review of an application by the NRC staff, an applicant may be required to supply additional information." Also, as stated in 10 CFR 2.108(a), an application may be denied "if an applicant fails to respond to a request for additional information within thirty (30) days from the date of the request, or within such other time as may be specified."

RAIs enable the NRC staff to obtain all relevant information needed to make a regulatory decision on a licensee's submittal that is fully informed, technically correct, and legally defensible. RAIs are necessary when the information is not included in the initial submittal, is not contained in any other docketed correspondence, or cannot reasonably be inferred from the information available to the NRC staff. As stated in NRC internal procedures, RAIs should be directly related to the applicable regulatory requirements associated with the licensee's request. RAIs should also be consistent with the plant's licensing basis and applicable codes, standards, and guidance. RAIs should not be used as general information requests or to encourage commitments from licensees.

NRR Office Instruction, LIC-115, "Processing Requests for Additional Information," (ADAMS Accession No. ML19242B237) provides the staff with guidance for developing and processing RAIs. This revision of LIC-115 also includes a guide for an electronic RAI (eRAI) workflow process. NRR implemented the modified eRAI process in October 2020, beyond new reactor activities to include reviews (e.g., amendments, renewals) for operating reactors and non-power facilities.

## **International Programs (OIP)**

The NRC's mandatory international responsibilities include licensing the export and import of nuclear materials and equipment and adopting regulatory requirements that are necessary to implement U.S. obligations relevant to NRC licensees under international treaties and conventions. The NRC also engages voluntarily in bilateral nuclear safety and security cooperation programs and assistance activities with regulatory counterparts around the world; it actively participates in and contributes technical and regulatory expertise to multilateral fora such as the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA), and has a robust international cooperative regulatory research program.

### **NRC International Policy Statement and Five-Year International Strategy**

In 2011, the Commission requested the Office of International Programs (OIP) to lead an assessment of NRC's international activities (SECY-12-0150, ADAMS Accession No. ML12275A087, non-public). This assessment, which included detailed interviews with internal and external stakeholders, determined that the NRC's international engagement was critical in support of both domestic and global U.S. Government priorities. As a result, the Commission requested the development of an international policy statement to formally document the importance of the agency's international program. This policy statement, which was issued in the *Federal Register* in July 2014 (76 FR 39415), emphasizes that "International activities are integral to the NRC's public health and safety and common defense and security mission and directly support U.S. foreign policy objectives." It also outlines specific elements in which the NRC commits to engage, as follows:

- Implementing obligations pursuant to international treaties and conventions and, with U.S. Government partners, supporting development and adoption of those pertaining to the NRC;
- Providing international assistance to foreign regulatory counterparts for improving safety and security of civilian uses of radioactive materials;
- Fostering international technical cooperation, sharing regulatory and operational experience, and supporting collaborative research for the mutual benefit of NRC programs and those of our international counterparts;
- Enhancing development of global nuclear safety, security, and safeguards regulatory partnerships; and
- Demonstrating leadership on regulatory issues, both within the international community and the U.S. Government.

At the same time, the Commission requested that staff revise the NRC's budget formulation to create a new International Activities product line under the existing Corporate Support Business Line. In 2014, OIP was also designated as the lead office for reporting on the International Activities product line resources agency-wide (SECY-14-0126, ADAMS Accession No. ML14287A177, non-public). The Commission subsequently directed OIP to lead the development of a new agency-wide Five-Year International Strategy (5YIS). The first 5YIS was drafted in 2014 and approved by the Commission in 2015 for the time period 2015-2020. The 5YIS examines both internal and external drivers that could impact the NRC's international activities, with the objective of establishing priority areas of focus to inform the dedication of NRC international resources to foster new and improve existing collaboration opportunities to positively influence the maintenance of a high standard of domestic and global nuclear safety and security.

In 2019, the staff conducted a repeat Strategic Assessment to support the drafting of a revised international strategy. The revised strategy was submitted to the Commission in June 2020 and is under review. It was developed in coordination with other agency strategic initiatives, such as the NRC Strategic Plan, Futures Assessment, and Strategic Workforce Planning and will evaluate the external global environment to identify the trends and drivers that are likely to arise in the international environment over the coming years. The staff focused on actionable outcomes that can help the agency determine the most efficient and effective use of resources for international engagement.

It is within this framework that the staff conducts the agency's program of international activities, as outlined below.

### **Conventions and Treaties**

The NRC engages in ongoing technical and regulatory activities to support U.S. and global adherence to the international nuclear-related conventions and treaties ratified by the U.S. Government. These include the Nuclear Non-Proliferation Treaty (NPT), the Convention on Nuclear Safety (CNS), the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (the Joint Convention), the Conventions on Physical Protection of Nuclear Material (CPPNM) and its Amendment, and the Conventions on Early Notification of a Nuclear Accident, and on Assistance in the Case of a Nuclear Accident or Radiological Emergency.

The NPT has a 5-year review cycle. The NRC participates on the U.S. delegation to the NPT Review Conference (RevCon) and former NRC Chairmen have spoken at events related to the peaceful use of nuclear and radiological materials at the past two RevCons in 2010 and 2015. The next RevCon was scheduled to take place in May 2020 but was postponed due to COVID-19 and tentatively rescheduled for January 2021. The NRC actively contributes to U.S. implementation of its obligations under the NPT through both its statutorily-mandated role as the agency that licenses exports of nuclear material and equipment for civilian purposes, and as a provider of regulatory assistance to foreign counterparts to strengthen their safety and security programs. The NRC offers its experience in implementing U.S. peaceful use obligations through ensuring licensee compliance under the Agreement between the United States and the IAEA for Application of Safeguards in the United States, the Protocol Additional to the U.S.-IAEA Safeguards Agreement (Additional Protocol), and the Agreement between the United States and the IAEA for the Application of Safeguards in connection with the Treaty for the Prohibition of Nuclear Weapons in Latin America (Treaty of Tlatelolco). The NRC staff also participates in nonproliferation coordinating committees of the U.S. Government to enhance the development of the policy, methodology and technology related to the global control of sensitive nuclear technologies.

The CNS and Joint Convention have staggered triennial review cycles. The CNS commits participating Contracting Parties to maintain a high level of safety by establishing fundamental safety principles to which they subscribe. CNS Contracting Parties include both countries operating land-based civil nuclear power plants and countries that do not have nuclear power programs. The NRC has the lead for technical implementation of the CNS for the U.S. Government. The CNS Review Meeting of Parties last met in March-April 2017. The Review Meeting scheduled for March-April 2020 was postponed until March 2021 due to COVID-19. At the next Review Meeting, NRC representatives will serve as a country group chair and a rapporteur. The NRC is the lead agency in the U.S. for developing the CNS U.S. National Report and reviewing other Contracting Parties' National Reports in advance of the Review

Meeting. At the Review Meeting, the NRC Chairman and Executive Director for Operations present the U.S. National Report, joined by the Chief Executive Officer of the Institute for Nuclear Power Operations.

The Joint Convention, for which the Department of Energy (DOE) and the NRC are technical co-leads, applies to spent fuel resulting from the operation of civilian nuclear reactors and to radioactive waste resulting from civilian applications. It also applies to spent fuel and radioactive waste from military or defense programs if such materials are transferred permanently to and managed within exclusively civilian programs, or when declared as spent fuel or radioactive waste for the purpose of the Convention by the Contracting Party. In addition, it covers planned and controlled releases into the environment of liquid or gaseous radioactive materials from regulated nuclear facilities. The most recent Joint Convention Review Meeting took place in May 2018. The Seventh Review Meeting for the Joint Convention is scheduled to be held from May 24 – June 4, 2021. In both CNS and Joint conventions, the focus remains on issues such as expanding the number of Contracting Parties, ensuring full and active participation in the triennial peer review process, and assisting countries to improve the safety of their civilian nuclear programs.

The Convention on the Physical Protection of Nuclear Material (CPPNM) is the only legally-binding international agreement mandating the standards of physical protection for civil nuclear materials. The CPPNM entered into force in 1987. The Convention obligates States to enact basic measures for the physical protection of civil nuclear material during international transport, requires States to criminalize the malicious misuse of nuclear material, and sets related standards for prosecution and extradition. The CPPNM was amended by diplomatic conference in July 2005. In May 2016 the CPPNM Amendment entered into force. The CPPNM Amendment (CPPNM/A) expands the scope of the original treaty to cover the physical protection of nuclear material used for peaceful purposes, not only while in international nuclear transport, but also while in domestic use, storage and transport, as well as in associated nuclear facilities used for peaceful purposes. The Amendment also commits States to cooperate for a more effective international response to nuclear events, including the loss or theft of materials, material trafficking, or sabotage. It also strengthens obligations for protecting the confidentiality of physical protection information received from other countries. The NRC and DOE serve as U.S. competent authorities for the CPPNM and the CPPNM/A. Staff continues to participate in U.S. interagency delegations in support of technical meetings for the representatives of States Parties to the CPPNM and its Amendment, and preparations for the Preparatory Conference tentatively scheduled for December 2020 and the first the first Review Conference of the CPPNM/A, currently scheduled for 2021.

### **Export/import licensing**

The NRC issues approximately 75-100 licenses per year authorizing primarily exports of nuclear fuel, reactor components, and radioactive sources to countries that meet the statutory criteria and regulatory requirements in 10 CFR Part 110 “Export and Import of Nuclear Equipment and Material.” OIP staff participates on U.S. delegations to the Nuclear Suppliers Group, a gathering of countries seeking to contribute to nonproliferation policies through the implementation of two sets of guidelines for nuclear exports and nuclear-related dual use exports. In addition, various IAEA guidance documents establish standards and practices that are relevant to NRC’s export and import licensing. These documents include, for example, the Code of Practice on International Transboundary Movement of Radioactive Waste, the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, the IAEA Code of Conduct on the Safety and Security of Radioactive Materials

(the “Code of Conduct”) and its Guidance on the Import and Export of Radioactive Sources (which was codified in Section 170H of the AEA), and the Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5).

Section 123 of the Atomic Energy Act of 1954, as amended, requires that significant nuclear exports from the United States take place only pursuant to an agreement for peaceful nuclear cooperation (123 Agreement) with the recipient country. Significant nuclear exports include power reactors, research reactors, nuclear material (including reactor fuel), and major components of reactors. Such agreements are negotiated by the U.S. Department of State, with the technical assistance and concurrence of the U.S. Department of Energy, and in consultation with the NRC. NRC staff contribute technical expertise during the negotiation of 123 agreements to ensure NRC’s authority to license exports and imports is not impeded as a result of the negotiated agreement.

An agreement for peaceful nuclear cooperation typically does not commit the United States to any specific exports or other cooperative activities, but rather establishes a framework of conditions and controls to govern subsequent commercial transactions, if any. The NRC cannot license the export of certain nuclear materials and equipment to another country without a 123 agreement in place. The United States currently has Section 123 agreements in force with 20 individual countries; European Atomic Energy Community (Euratom), which covers the 27 European Union Member States; and the IAEA; as well as a 123 Agreement covering exports to Taiwan. The NRC is statutorily required to provide its views on a proposed 123 agreement via a letter from the NRC Chairman directly to the President.

From 2011-2019, the staff supported 123 Agreement negotiations with China, the IAEA, Mexico, Norway, the Republic of Korea (ROK), Saudi Arabia, Taiwan, United Kingdom (U.K.), and Vietnam. Looking forward, it is anticipated that in the next 5 years several additional countries, including South Africa and Thailand, will seek either to enter into new Section 123 agreements with the U.S., or to renegotiate agreements which are set to expire.

The NRC also contributes its technical expertise to the drafting and negotiation of Nuclear Cooperation Memorandum of Understandings (NCMOUs). As a diplomatic initiative for the Department of State, the proposed NCMOUs would frame existing or new civil nuclear cooperative activities in a strategic context. Envisioned as agreements that can be more quickly negotiated and signed than a “123 Agreement,” an NCMOU can serve as a mechanism for U.S. senior leadership to provide high-level support for the U.S. civil nuclear industry at the very start of a potential partner country’s development. As of August 2020, NCMOUs have been concluded with Poland and Romania and the Department of State is actively negotiating MOUs with Armenia, Ghana, and Kenya.

Also, in support of NRC export/import licensing responsibilities, the NRC participates in ongoing U.S. Government interagency bilateral physical protection information exchange visits with countries possessing U.S.-origin nuclear material. Physical protection bilateral visits were conducted with Australia, Canada, and Germany in 2018 and with Argentina, Japan, the Philippines, and South Africa in 2019.

### **Bilateral activities**

The NRC is engaged in a wide range of bilateral programs with its international counterparts that enhance the safety and security of peaceful nuclear activities worldwide. The NRC has bilateral Arrangements for Technical Information Exchange and Cooperation with more than 45

countries, Euratom, and the Taipei Economic and Cultural Representative office in the United States (Taiwan). These Arrangements facilitate the exchange of both public and non-public nuclear safety (and in some cases security) information. The NRC also conducts joint research activities with international partners through more than 100 technical research agreements. Bilateral “umbrella” Arrangements are approved by the U.S. Department of State and vetted with appropriate U.S. Government agencies, through the Circular 175 review process, to ensure there is policy alignment. On a limited, case-by-case basis the NRC hosts personnel from foreign governments and related technical safety organizations to provide on-the-job regulatory experience and training in the United States as temporary assignees in NRC program offices. The NRC and its foreign counterparts both derive benefits from foreign assignees through the sharing of nuclear regulatory experience, establishing productive working relationships, and facilitating global commitments to nuclear safety and security. The NRC also seeks opportunities for its staff to work at foreign regulatory organizations to broaden the NRC staff's understanding of regulatory activities in other countries. In FY 2020, there were two foreign assignees at NRC headquarters and regional offices, and two NRC staff members completed assignments in France and Japan. This number is lower than normal due to COVID-19 travel restrictions; in a typical year, the NRC hosts 3-6 assignees at a time.

### **Cooperation**

The agency continues its strong program of cooperation with countries with mature nuclear programs, sharing information and best practices on the issues of mutual interest/applicability. The objective is to ensure the sharing of regulatory issues and operational experience arising from the possession and use of nuclear materials and the licensing and operation of nuclear power plants, research and test reactors, fuel cycle facilities, and radioactive waste storage and disposal facilities. Consulting frequently with regulatory agencies in other countries has many benefits, including: (a) awareness of operating reactor safety issues that could impact plants operating in the United States; (b) awareness of reactor construction activities that could apply to new reactors being built or licensed in the United States; (c) prompt notification to foreign partners of U.S. safety issues; and (d) an established network of reliable connections that can be engaged immediately in the event of an accident or incident. Further, engaging in bilateral (or multilateral) nuclear safety research cooperation enables the NRC and its regulatory counterparts to derive maximum benefit from these activities by gaining access to research facilities not available in the United States. During ongoing travel restrictions due to COVID-19, the staff has conducted numerous virtual meetings with international counterparts to continue these important relationships.

### **Assistance**

The NRC provides capacity-building support to over 50 foreign regulatory counterparts to enhance their national nuclear safety and security programs through the agency's International Assistance Program. The program supports the United States' peaceful uses commitments under the NPT, which requires that NPT non-nuclear weapon states agree to never acquire nuclear weapons in exchange for NPT nuclear weapon states sharing the benefits of peaceful nuclear technology. These resources are expended without the expectation that the exchange will provide immediate benefits to an NRC regulatory program area. However, such exchanges are viewed by the Commission, the larger U.S. Government, and the international community as invaluable tools for establishing multilateral coalitions, enhancing global nuclear safety and security, and strengthening regulatory programs for nuclear power plants, research reactors, and radioactive materials. In 2014, the Commission reaffirmed its support for the International

Assistance Program in its International Policy Statement. The significance of the program is also captured in the NRC's 2018-2022 Strategic Plan and the NRC's International Strategy.

The NRC International Assistance Program grew in the late 1980s in response to the Three Mile Island and the Chernobyl accidents and significant foreign policy events such as the dissolution of the Soviet Union. The NRC, in close coordination with other parts of the U.S. Government, established a nuclear safety cooperative effort with its (then) Soviet regulatory counterpart. This effort later evolved to include providing information, knowledge, and training to international regulators responsible for the oversight of Soviet-designed reactors to assist them as they developed their national regulatory infrastructure and programs. Since then, the NRC's International Assistance Program has expanded globally and added a broader program of safety. Following the September 11, 2001, terrorist attacks and the subsequent increased focus on securing radioactive materials of concern, the NRC added a program of source security and physical protection assistance to protect U.S. national security interests and to help prevent the misuse of radioactive sources for malevolent purposes.

The current NRC International Assistance Program is focused on providing information, best practices and lessons learned, peer review of documents, and training to other countries to assist them as they develop their national nuclear regulatory infrastructure and programs. Topical areas where such assistance is provided include power and research reactor operational safety, regulatory infrastructure development for new nuclear power plants, safety and security of radioactive sources, and uranium recovery facilities and activities. Assistance is also provided bilaterally and regionally through partnerships with the IAEA and its regional nuclear safety networks. Activities are conducted with counterparts in Eastern and Central Europe; Africa; Latin America and the Caribbean; the Middle East; and Central and Southeast Asia.

### **Multilateral activities**

The NRC is actively involved in the various nuclear safety, security, safeguards, emergency preparedness, and research and development programs of the IAEA and the NEA of the Organisation for Economic Co-operation and Development (OECD). NRC managers and experts serve as leaders or representatives on IAEA committees to develop safety standards and security guidance and on NEA committees and working groups that address a variety of significant technical issues. NRC bilateral assistance activities are coordinated with the IAEA to ensure alignment and to prevent duplication with multilateral assistance activities.

### **International Atomic Energy Agency**

The NRC staff participates in more than 150 IAEA technical and advisory meetings per year. In addition, the staff participates in approximately 5-10 Integrated Regulatory Review Service (IRRS) and International Physical Protection Advisory Service peer review missions per year. Additionally, nuclear power plants in the United States volunteer to host Operational Safety Review Team (OSART) missions every three years. In April 2017, the Sequoyah Nuclear Power Plant (NPP) hosted an OSART. The next OSART is scheduled to be hosted by the Wolf Creek NPP in November 2020, but this may be postponed due to COVID-19.

Through its involvement with the IAEA, the NRC participates in a number of standing committees and working groups focusing on enhancing international assistance (e.g., Regulatory Cooperation Forum, Small Modular Reactors Regulators Forum), as well as drafting and approving IAEA guidance and standards in the areas of nuclear safety and security (e.g.,

Commission on Safety Standards, Nuclear Security Guidance Committee). In addition to participating in IAEA meetings and missions, the NRC continues to support IAEA's assistance to foreign regulatory counterparts to enhance their national nuclear safety and security programs. The IAEA's assistance efforts focus on regulatory infrastructure development for new and operating nuclear power plants, research reactors, and safety and security of radioactive sources. Additionally, the NRC has provided cost-free experts (CFEs) on short-term assignments to the IAEA. The NRC currently has two CFEs at the IAEA: one focused on nuclear security (2019-2021) and another focused on enhancing nuclear safety coordination across regions (2020-2022). In addition, staff may apply for employment at the IAEA for positions typically ranging from 1-5 years. There are three NRC staff currently at the IAEA: one has served 4 years at the IAEA as a technical expert in waste and decommissioning and is returning in October 2020; and there are two currently serving in the IAEA's Incident and Emergency Centre (2019-2021) and (2020-2021). To help advance the U.S. Government's priorities at the IAEA and support NRC activities, a staff member serves as the Nuclear Safety Attaché at the U.S. Mission to the International Organizations in Vienna.

### **Nuclear Energy Agency**

The NEA is an intergovernmental agency that facilitates cooperation among countries with advanced nuclear technology infrastructures to seek excellence in nuclear safety, technology, science, environment, and law. The NEA, which is under the framework of the OECD, is headquartered in Paris, France. There are 33 member countries, with Argentina and Romania being the newest members who joined in 2017. The Director-General of the NEA is William D. Magwood, IV, former NRC Commissioner.

The NRC is actively engaged in the NEA's multilateral cooperative research and development projects. More than 45 NRC managers and staff serve in leadership or participatory roles in the NEA Steering Committee and the major NEA standing technical committees and working groups in the areas of nuclear regulatory activities, safety of nuclear installations, radioactive waste management, radiation protection, public health, and nuclear law. Current topics of interest include aging management and analysis of accidents, inspection practices, advanced reactors, accident tolerant fuels, human and organizational factors, public communication, new reactors, Fukushima lessons learned, fuel cycle safety, decommissioning and dismantling, and nuclear emergencies. The most recent endeavor is a new multilateral FIDES [Framework for Irradiation Experiments] cooperative research project for receipt of valuable reactor safety data no longer available due to the permanent shutdown by the Norwegian Institute for Energy Technology of the Halden Reactor – an extensive loss to the worldwide nuclear research community.

In addition, the NRC has leadership roles in the Multinational Design Evaluation Program (MDEP), for which the NEA serves as Secretariat. MDEP's membership is comprised of nuclear regulatory organizations from 16 countries that are pursuing nuclear reactor construction. This international initiative aims to improve the efficiency and the effectiveness of the regulatory design reviews of new commercial power reactors. Chairman Svinicki is the current U.S. Government representative to the MDEP Policy Group. The NRC participates in the MDEP Steering Technical Committee, the AP1000 and APR1400 design-specific Working Groups, and the Vendor Inspection Cooperation Working Group. During the September 2019 MDEP Policy Group Meeting, the members concluded that MDEP would be sunset and not continue in its current form beyond 2022.

## **Exports of High Enriched Uranium (HEU) to Research and Test Reactors (OIP)**

### **Report to Congress**

Section 3175 of the American Medical Isotopes Production Act of 2012 (AMIPA), which was passed as part of the National Defense Authorization Act for Fiscal Year 2013 (on January 2, 2013), required the Chairman of the NRC, after consulting with other relevant agencies, to submit a report to Congress by January 2, 2014, on the current disposition of certain high enriched uranium (HEU) exports from the U.S.

On January 9, 2014, the NRC provided Congress a public report on the disposition of HEU exported for use as fuel in a research or test reactor and for use as targets, which are irradiated in research or test reactors and processed to produce medical isotopes. Additional country-specific information was provided in a non-public annex, which is designated "Confidential/Foreign Government Information-Modified Handling Authorized." According to the public report, over 90% of U.S. exports of HEU for use as fuel or targets in research and test reactors occurred before 1990. The U.S. exported HEU to 35 countries (directly or indirectly) since 1957 for use as fuel or targets in research and test reactors.

The NRC staff is not aware of any HEU exported from the U.S. that is missing from the foreign national sovereignties to which it was exported. No country has ever notified the U.S. that they lost or did not receive U.S.-supplied HEU or that they completely relinquished control over the material when they were finished with it.

### **Recent Exports of HEU and Current Issues**

Since 2014, the NRC has issued eleven licenses authorizing exports of HEU for ultimate use by medical isotope producers in three countries: Belgium (7), Canada (3), and the Netherlands (1). The NRC has also issued one license authorizing an export of HEU for use as fuel in the BR-2 research reactor in Belgium and another license authorizing the export of HEU for use as fuel in the research reactor at the Laue-Langevin Institute in France. No further licenses will be issued by the NRC authorizing exports of HEU to medical isotope producers in Canada and the Netherlands, because the Canadian facility was shut down and the Netherlands' medical isotope producer has converted to low enriched uranium targets.

AMIPA amended Section 134 of the Atomic Energy Act to include a sunset provision prohibiting the issuance of a license to export HEU for the purposes of medical isotope production after January 2, 2020. However, AMIPA permitted the Secretary of Energy to delay the sunset provision by up to six years, by certifying that there is an insufficient global supply of Mo-99 produced without the use of HEU available to satisfy the domestic market and that the export of U.S.-origin HEU is the most effective temporary means to increase the supply of Mo-99 to the domestic market. On January 2, 2020, the Secretary of Energy made this certification, delaying AMIPA's sunset provision by no more than two years. Consequently, the NRC completed review of a pending application from DOE/NNSA for a license to export HEU to Belgium for medical isotope production and submitted the results to the Commission. On April 13, 2020, the Commission approved a Memorandum and Order directing the Office of International Programs (OIP) to issue the license and responding to requests for hearing and petitions to intervene filed by NorthStar Medical Radioisotopes, LLC, Nuclear Threat Initiative, Curium US, LLC, and Dr. Alan J. Kuperman. The Memorandum and Order denied the requests for hearing and petitions to intervene.

OIP issued the export license to DOE/NNSA on April 13, 2020, with special conditions. The license limits the quantity authorized for the initial shipment to two kilograms of HEU and requires the licensee to determine quantities and timing of subsequent shipments by monitoring the progress of Belgium's efforts to convert to low enriched uranium targets coupled with associated analyses of the demand for and supply of medical isotopes. The licensee is also required to submit a status report by January 4, 2021, documenting the quantities of HEU shipped to Belgium during the previous calendar year, and providing projections and rationale for any shipments that may be scheduled before the licenses expires on December 31, 2021.

### **Impact on China Policy for Exports Authorized by NRC (OIP)**

On October 11, 2018, the U.S. Government announced a new policy governing civil nuclear cooperation with China. This policy established a framework for the disposition of future 10 CFR Part 110 license applications for nuclear commodity exports to China, and 10 CFR Part 810 authorization requests for nuclear technology transfers to China. The framework categorizes types of exports (e.g., technology, equipment, and material), as well as end-users, and establishes parameters by which pending and future export license applications will be evaluated. The policy framework also struck a balance between restricting certain transfers of specialized technology and know-how, as well as more sensitive technology associated with SMRs and non-light water advanced reactors and allowing for the positive economic and strategic impact resulting from transfers involving lower risk and less sensitive commercial parts and components. This review was initiated in response to a growing number of concerns about China's motives and behavior including, but not limited to, the conviction of a U.S. nuclear engineer, Allen Ho, and the indictment of China General Nuclear Power Corporation (CGN) for illegally acquiring and transferring U.S. civil nuclear technology without proper U.S. authorization.

Since the policy was announcement, the NRC has engaged in outreach activities to explain the effects of the policy on NRC export applications to NRC license holders, applicants, U.S. Congress, foreign governments, and other non-government organizations. The NRC also communicates regularly with the Executive Branch on the status of pending applications and continues to make substantial progress on reducing the backlog of long-pending license applications for exports to China. From the October 11, 2018, policy announcement to July 31, 2020, NRC issued sixteen licenses authorizing exports of nuclear material or equipment to China and ten applications were withdrawn without action. Currently, there are approximately forty active NRC licenses that authorize the exports of nuclear material, components and reactors to China.

## **Memorandum of Cooperation with the Canadian Nuclear Safety Commission (OIP)**

On August 15, 2019, the NRC and the Canadian Nuclear Safety Commission (CNSC) signed a non-binding Memorandum of Cooperation (MOC) that establishes the framework for enhanced collaboration on nuclear regulatory reviews of advanced reactor technologies. The MOC provides the opportunity for both agencies to increase regulatory effectiveness through collaborative work on the technical reviews of advanced reactor and small modular reactor technologies. The MOC is an extension of the 2017 umbrella NRC-CNSC Memorandum of Understanding and enhances efforts to realize innovation in the review of advanced reactor and small modular reactor technology concepts. Through the Subcommittee on Advanced Reactor Technologies and Small Modular Reactors, the NRC and the CNSC are working to share information and evaluate cooperative opportunities and best practices in the analysis of advanced reactor and small modular reactor designs.

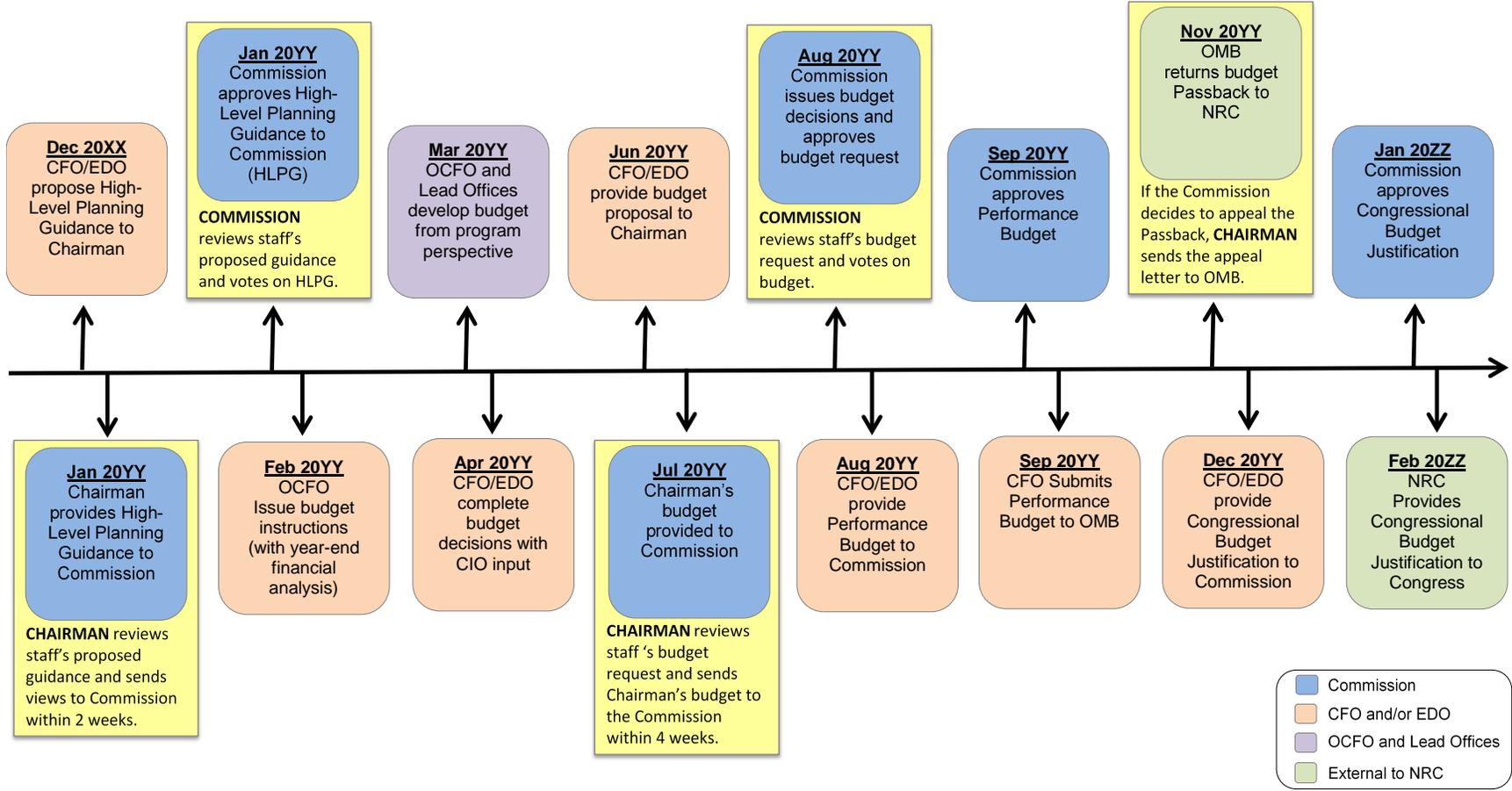
### **How the NRC Budget Formulation Process Works (OCFO)**

NRC's budget formulation process is documented in Management Directive 4.7, "Budget Formulation." The budget is used to obtain the necessary resources to effectively carry out the agency's mission and establish performance indicators designed to monitor the use of these resources to achieve established strategic goals. The annual performance budget is prepared (formulated) and submitted in accordance with the Budget and Accounting Act of 1921, as amended; Office of Management and Budget (OMB) Circular No. A-11, "Preparation, Submission, and Execution of the Budget"; and the GPRA Modernization Act of 2010 (GPRAMA).

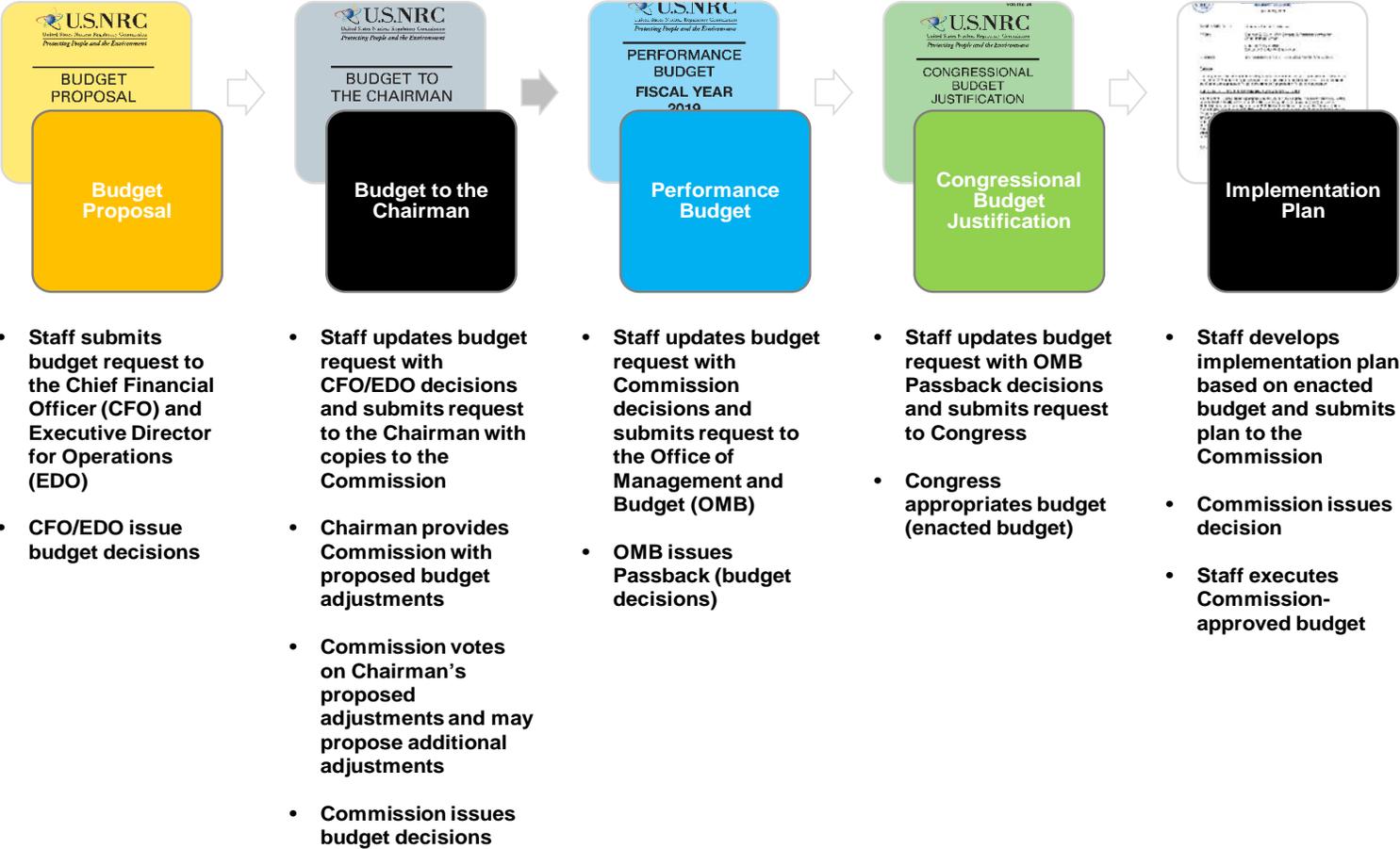
Figure 1 on the following page provides an overview of the timeline for NRC's budget formulation process, including the Commission's role in the process. Figure 2 on the next page provides an overview of the major deliverables for the budget formulation process, including additional information on the Commission's role in the process. The timeline is driven by two key external government-wide due dates - the Performance Budget is due to OMB the second Monday in September, and the Congressional Budget Justification (CBJ) is due to Congress the first Monday in February. The Commission's timely review of the budget products is key to the agency's ability to meet the external due dates.

Because NRC is an independent safety regulator it is not appropriate for stakeholders to be involved in NRC's budget formulation. In addition, Section 22.1 of OMB Circular No. A-11 requires that pre-decisional budget deliberations remain confidential until the release of the President's Budget Request to Congress (the Congressional Budget Justification). However, NRC seeks, through established processes such as public meetings and Regulatory Issue Summaries, to encourage industry to provide the NRC details of potential projected workload activities that would require NRC's review in order to better inform budget formulation workload assumptions.

**Figure 1: Budget Formulation Timeline**



**Figure 2: Budget Formulation Major Deliverables**



## **Fee Recovery (OCFO)**

Prior to FY 2021, the NRC's fee recovery was primarily governed by two laws: 1) the Independent Offices Appropriation Act, 1952 (IOAA) (31 U.S.C. 9701), and 2) the Omnibus Budget Reconciliation Act of 1990 (OBRA-90) (42 U.S.C. 2214). The IOAA generally authorizes and encourages Federal regulatory agencies to recover—to the fullest extent possible—costs attributable to services provided to identifiable recipients. OBRA-90 required the NRC to recover approximately 90 percent of its budget authority, less certain excluded items, through fees. Under OBRA-90, ten percent of the remaining budget authority did not need to be recovered through fees, and the activities included in this ten percent were referred to as “fee-relief” activities.

Effective October 1, 2020, the Nuclear Energy Innovation and Modernization Act (Public Law 115-439) (NEIMA), which was enacted in January 2019, repeals the fee-recovery requirements in OBRA-90 and replaces OBRA-90 as the primary statute directing the NRC's fee recovery. While NEIMA retains fairness and equity in the fee-recovery requirements as well as other OBRA-90 requirements, there are several key changes. NEIMA requires the NRC to collect approximately 100 percent of its budget authority less certain excluded items, to the maximum extent practicable; this change eliminates the 10 percent limit on fee-relief activities that existed under OBRA-90. NEIMA excludes from the 100 percent calculation specific items identified in NEIMA, including any fee-relief activity as identified by the Commission. NEIMA also places a cap on annual fees for operating power reactors; specifically, NEIMA provides that the per-licensee annual fee charged to the operating power reactors fee class, to the maximum extent practicable, shall not exceed the FY 2015 annual fee amount adjusted for inflation.

Like OBRA-90, NEIMA requires the NRC to use its IOAA authority first to collect service fees for NRC work that provides specific benefits to identifiable applicants and licensees (such as licensing work, inspections, and special projects). The regulations at 10 CFR Part 170 authorize these fees. The NRC also assesses “annual fees” under 10 CFR Part 171 to recover the remaining amount necessary to meet the fee-recovery requirement. These annual fees recover costs that are not otherwise collected through 10 CFR Part 170.

Fee calculation begins with the total appropriated budget authority, less the excluded items. The excluded items under NEIMA include any fee-relief activity, as identified by the Commission; amounts appropriated to the Commission from the Nuclear Waste Fund; and amounts appropriated to the Commission for Waste Incidental to Reprocessing, generic homeland security activities, Inspector General services for the Defense Nuclear Facilities Safety Board, research and development at universities in areas relevant to the mission of the Commission, a nuclear science and engineering grant program, and activities related to the development of regulatory infrastructure for advanced nuclear reactor technologies. After the excluded items are deducted, the NRC determines the amount of total fees that the NRC must collect in that fiscal year. The total budget authority less offsetting fees is referred to as the Net Budget Authority, or net appropriation.

Each year, the NRC develops a proposed fee rule and publishes it for stakeholder comment in the *Federal Register*. The NRC then addresses any comments received on the proposed rule and publishes the responses in the final fee rule. In addition, the timing of the final fee rule is impacted by the timing of when the NRC receives a final appropriation. The NRC published the FY 2020 final fee rule on June 19, 2020, at 85 FR 37250. For the FY 2020 Final Fee Rule, the NRC's total amount to be recovered through 10 CFR Parts 170 and 171 fees is approximately

\$728.1 million, compared to about \$780.8 million for FY 2019, a decrease of \$52.7 million. Annual fees for licensees will decrease or increase based on the allocated budgetary resources to each class of licensees and the estimate of the billed 10 CFR Part 170 fees for services.

In SRM-SECY-16-0097, dated October 19, 2016, (ADAMS Accession No. ML16293A902) for SECY-16-0097, “Fee Setting Improvements and Fiscal Year 2017 Proposed Fee Rule,” (ADAMS Accession ML16194A365), the Commission directed the staff to undertake a number of improvements as part of the fee transformation initiative. The improvements implemented as part of the fee transformation initiative were intended to achieve the goal of increasing transparency, timeliness, and equitability of the NRC fees setting process. Since 2016, the NRC has dispositioned 37 of the 40 improvements; this list can be viewed on the NRC license fees public Web site at: <https://www.nrc.gov/about-nrc/regulatory/licensing/fees-transformation-accomplishments.html>. The status of the three remaining improvements is described in the following paragraphs, two of which were completed in FY 2020.

The Commission directed the staff to explore, as a voluntary pilot, whether the NRC could establish a flat fee structure for routine licensing matters in the area of uranium recovery and to examine opportunities to accelerate the transition to an electronic billing system. In addition, the Commission directed the staff to begin the fee transformation activities listed in SECY-16-0097 as “Process Changes Recommended for Future Consideration—FY 2018 and Beyond,” which includes one remaining item to complete regarding the rulemaking to update the NRC’s small business size standards promulgated at 10 CFR 2.810, “NRC Size Standards.”

With respect to the voluntary flat fee pilot, on January 9, 2020, the NRC provided a report to Congress, a requirement added by NEIMA, describing the results of the pilot initiative and the decision to maintain the current NRC fee billing structure for uranium recovery licensing matters (ADAMS Accession No. ML20010D684).

With respect to electronic billing, in October 2019, the agency released its eBilling system, which is a public facing, web-based application available for use by the NRC’s licensees. The eBilling application provides licensees with immediate delivery of NRC invoices, customizable e-mail notifications, the capability to view and analyze invoice details, and the convenience to access U.S. Department of the Treasury systems to pay invoices. The eBilling application provides additional transparency, increasing applicant and licensee confidence in the assessed fees and charges. The eBilling system is now fully implemented.

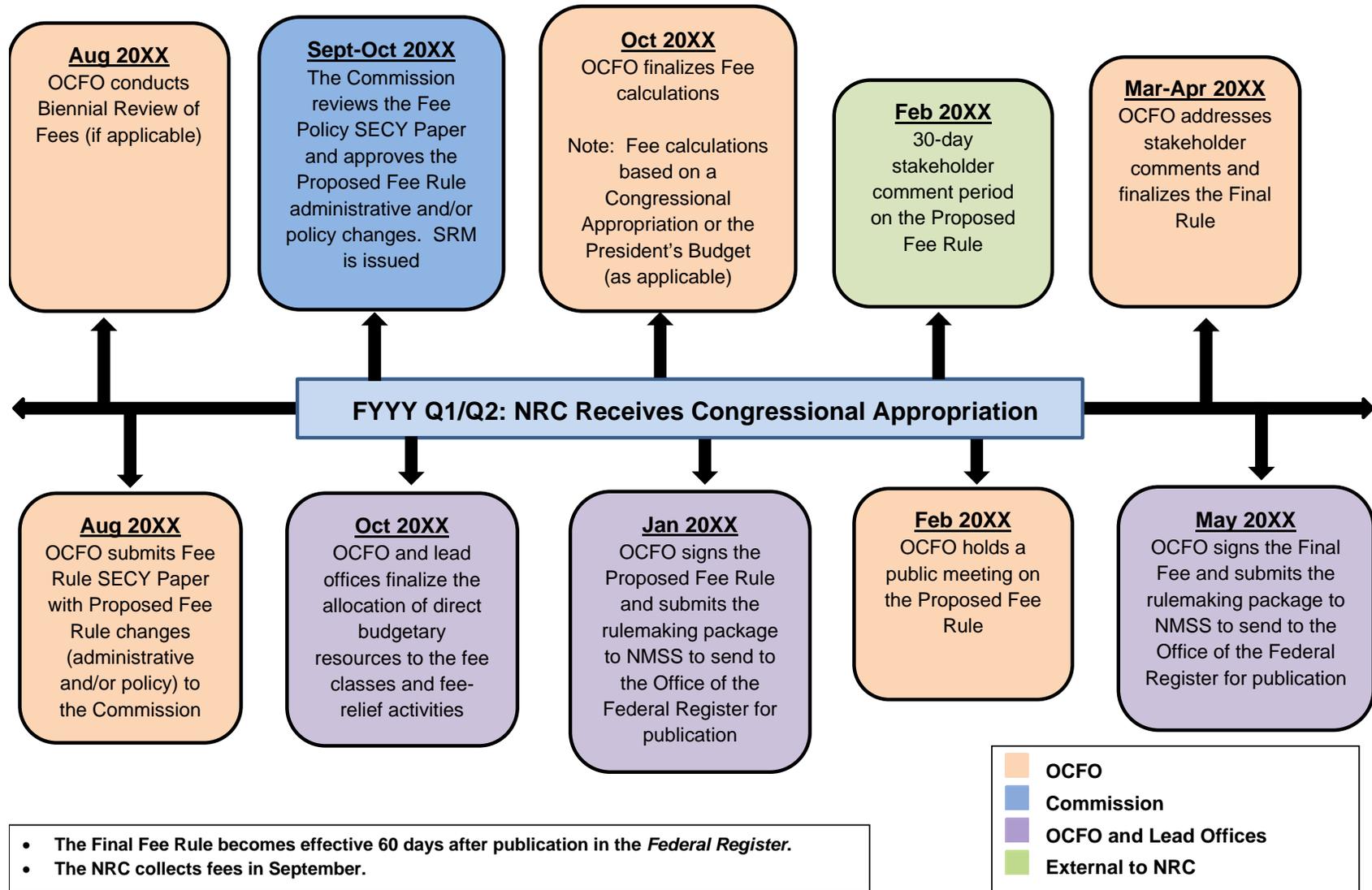
As part of the fee transformation initiative, the NRC conducted a survey of materials licensees to collect relevant data to help determine the need for changes to the NRC’s small business size standards promulgated at 10 CFR 2.810. In addition, the staff considered the changes in the small business size standards published by the Small Business Administration (SBA) as of 2019. The NRC published a document announcing the voluntary survey in the *Federal Register* on February 4, 2020 and requested a response by a due date of April 30, 2020.<sup>1</sup> The staff analyzed the survey results to determine whether a change to the size standards is warranted. The staff also reviewed the SBA size standards, as adjusted for inflation.<sup>2</sup> The NRC staff will submit a rulemaking plan for a proposal to adjust the NRC’s size standards.

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<sup>1</sup> Survey of NRC’s Materials Licensees (85 FR 6225; February 4, 2020).

<sup>2</sup> Small Business Size Standards: Adjustment of Monetary-Based Size Standards for Inflation (84 FR 34261; July 18, 2019).

**Figure 3: Fee Rule Major Milestones**



**Government Accountability Office (GAO) Engagements on the NRC Budget Process (OCFO)**

The Government Accountability Office (GAO) audit “Changes Planned to Budget Structure and Justification” (GAO-17-294), issued March 8, 2017, did not include any recommendations, only findings concerning budget structure changes and transparency. The NRC acknowledged the findings raised by GAO in their audit, and changes were made to increase transparency in the budget request, such as improvements in the presentation of the budget and better alignment of formulation to execution. For example, starting with the FY 2018 Congressional Budget Justification (CBJ) prior year actuals were included on all budget tables, and starting with the FY 2019 CBJ significant accomplishments for the prior year were added to each business line section.

The NRC has responded to the U.S. Government Accountability Office (GAO) Report: “Fee-Setting, Billing, and Budgeting Processes Have Improved, but Additional Actions Could Enhance Efforts” (GAO-20-362), dated February 28, 2020. In a letter dated August 27, 2020, the NRC stated that it agrees with the findings and recommendations in the report. The NRC is in the process of implementing GAO’s recommendations. First, the GAO recommended that “[t]he Executive Director for Operations of NRC should ensure relevant NRC program offices develop policy and guidance for when to communicate information on work progress to licensees, such as through communications to licensees at specified timeframes or thresholds.” The NRC will review its current practice of providing work progress to licensees and develop or revise relevant policies and guidance. Second, the GAO recommended that “[t]he Chief Financial Officer of NRC should, in consultation with NRC program offices, develop guidance to ensure NRC staff clearly define what costs—such as project management—are included in its public cost estimates.” The NRC will issue guidance on describing the costs that are included in the public cost estimates posted on the NRC website.

### **Corporate Support Reduction (OCFO)**

In the FY 2021 Congressional Budget Justification, the corporate support budget is approximately 31 percent of the agency's total budget. As compared to the FY 2014 Enacted Budget, the agency has reduced the corporate support budget by 30 percent. Reductions reflect ongoing efforts to streamline and consolidate corporate support functions, and reduce office space and related costs, such as rent, utilities and security. In addition, the NRC has achieved cost savings in information technology resulting from efforts to move to a more secure, agile, and cost-effective infrastructure. The Nuclear Energy Innovation and Modernization Act caps Corporate Support in the annual budget justification, to the maximum extent practicable, at 30 percent of the total budget request in FY 2021 and steps down to 28 percent by FY 2025.

## **Integrated University Program (RES)**

The Integrated University Program (IUP) provides grants to academic institutions to support education in nuclear science and engineering, to develop a workforce capable of supporting the design, construction, operation, and regulation of nuclear facilities and the safe handling of nuclear materials. The IUP funds scholarships, including scholarships to 2-year trade schools and community colleges, graduate fellowships, and faculty development opportunities. The IUP is important to sustain academic programs and research in nuclear-related fields.

Each year, since its inception in 2009, the NRC has provided approximately \$15M under its IUP. On average, approximately 50 IUP grants are awarded each year to colleges and universities, including minority serving institutions, in support of their nuclear science and engineering programs. The IUP has been widely acclaimed and well received by universities for its impact in attracting students to nuclear science and engineering.

### **Background of the IUP**

The Omnibus Appropriations Act, 2009 (Public Law 111-8) established the IUP between the NRC, the Department of Energy (DOE), and the National Nuclear Security Administration (NNSA).<sup>1</sup> The act authorized the appropriation of \$45 million per year from fiscal year (FY) 2009 to FY 2019, with \$15 million for each agency. Of that, \$10 million is to be used for university research and development in areas relevant to the respective organization's mission and \$5 million to support a jointly implemented Nuclear Science and Engineering Grant Program to fund multi-year research projects that do not align with programmatic missions but are critical to maintaining the discipline of nuclear science and engineering. After initial consultation, the three agencies decided that "jointly implemented" would be accomplished as a coordinated effort. Each agency would independently manage its own portion of the program, but coordination would be done to eliminate duplication or overlaps, and to ensure coverage of nuclear science, engineering, and related technical areas. Coordination is done through semi-annual meetings between the NRC, DOE, and NNSA.

### **Current Status**

The 10-year IUP Congressional authorization included in the Omnibus Appropriations Act, 2009 expired at the end of FY 2019. Congress authorized the IUP for FY 2020 by appropriating \$16 million for that purpose in the Energy and Water Development and Related Agencies Appropriations Act, 2020. The Act required that \$10,500,000 of the FY 2020 appropriation shall be for university research and development in areas relevant to the Commission's mission, and \$5,500,000 of the FY 2020 appropriation shall be for a Nuclear Science and Engineering Grant Program that will support multiyear projects that do not align with programmatic missions but are critical to maintaining the discipline of nuclear science and engineering.

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<sup>1</sup> The previous year, in FY 2008, \$15 million was shifted from DOE to the NRC to administer grant programs for faculty development, fellowships, and scholarships, including scholarships to trade schools and community colleges.

## **Transformation (OEDO)**

Technological evolution and economic trends affecting the nuclear energy sector, as well as the commercial and medical use of nuclear materials, are likely to influence the agency's workload in coming years, in both type and scale. In such a dynamic environment, NRC will be challenged to operate with efficiency and agility while continuing to meet its mission. Transformation at the NRC is about being (and becoming) a modern risk-informed regulator that promotes and embraces innovative approaches to achieve the NRC's mission. Transformation at the NRC is not one initiative or one specific end state; rather transformation is NRC's collective actions and activities that are contributing to creating, maintaining, and valuing an enhanced culture that is open to new means to achieve the NRC's mission. NRC's mission is not changing, but we are embracing new approaches to how to achieve the mission.

In late 2018 through early 2019, NRC conducted a scenario planning exercise where it formally assessed how NRC's external operational environment might evolve through 2030 and beyond; the findings from that effort were documented in a report entitled, "The Dynamic Futures for NRC Mission Areas." Global and domestic nuclear power demand and the dimensions of nuclear technology innovation are likely to be key drivers for NRC's mission portfolio, but there still exists a high degree of uncertainty with respect to the likelihood of any given outcome. After the issuance of the Dynamic Futures report, agency leadership identified the need for additional outreach to staff to solicit ideas and insights on actions that NRC could take to prepare for the future. In the vein of seeking out new and modernized approaches to the way that NRC works, the agency used, for the first time, a social media platform called Yammer to facilitate an event called the NRC Futures Jam, which was held in June 2019. Staff had the ability to make and respond to comments, and to participate in facilitated discussions with agency leaders. Staff participation in the Futures Jam substantially exceeded expectations and several thousand posts were made.

Based on insights from the futures assessment exercise and themes that emerged from the Futures Jam, NRC leadership established a framework for transformation that encompasses a broad set of activities intended to advance the agency towards the vision of being a modern, risk-informed regulator. There are four key focus areas for transformation: (1) managing the workforce, (2) ensuring that risk is considered in decision-making (also referred to as Be riskSMART), (3) generating innovative ideas to improve the ways that NRC works, and (4) adopting new technologies and approaches to data analytics. Currently, the scope of transformation is primarily focused on how the agency conducts its work and does not envision substantive changes to existing regulatory policies and regulations.

In October 2019, NRC launched seven staff-led initiatives, collectively referred to as Horizon 1, to support the four focus areas:

- Agency Desired Culture—Building into our culture a mindset that welcomes change while reinforcing the behaviors and outcomes described in the agency's Leadership Model
- Be riskSMART—Developing a common framework that can be used to consider and manage the risk presented in NRC activities. This framework can be used in all technical, corporate and legal undertakings.
- Career Enhancement—Clarifying and communicating opportunities to ensure that all staff understand paths that will enable them to grow throughout their career

- InnovateNRC 2.0—Finalizing and implementing a new agencywide innovation process and technology platform to create and sustain a culture of innovation
- Process Simplification—Simplifying and reinforcing our processes to achieve greater efficiency
- Signposts and Markers—Enhancing awareness of external signposts and markers pertinent to anticipating future agency workloads, and adapting decision-making process to incorporate these indicators
- Technology Adoption—Enabling all staff to easily and efficiently complete their work with available technology and increasing the use of new and existing technology across the agency

Some of these initiatives leveraged work that is already underway across NRC, while others involved the launch of new activities or programs to implement focused solutions for specific challenges. Of these initiatives, Career Enhancement, InnovateNRC 2.0, Signposts and Markers, and Technology Adoption are complete or nearly complete. Additional initiatives will launch as these initial ones are finished. In July 2020, staff kicked off a new initiative called Career Journey, which will disseminate information on career paths at the agency. The majority of initiative-focused work is anticipated to be completed by the end of 2021, but with the understanding that NRC will establish a culture with openness to innovation as an institutional norm.

Since 2018, the Commission has held meetings on Transformation approximately every 6 months, the most recent of which was on September 17, 2020 to discuss the progress of transformation activities. The focus topics for the meeting were the Culture Improvement Strategy; the new agency-wide innovation platform called Innovate NRC 2.0; the Signposts and Markers dashboard, which uses nuclear energy sector indicators to proactively inform strategic decision-making; and the use of data analytics to improve the Nuclear Reactor Safety Program. Some of the major achievements from the transformation activities have been:

- The Be riskSMART initiative team developed a framework that gives staff confidence in accepting well-managed risks in our decisionmaking without compromising the NRC's mission, and can be used across all disciplines. This framework was instrumental in the decision making for many activities during the new risk that the COVID-19 public health emergency presented to our inspection staff and licensees.
- Similarly, our technology adoption team has conducted approximately 91 training sessions on Office365 to more than 3,200 participants and created a network of peers to share IT insights, which were critical in helping us quickly transition to working remotely during the COVID-19 public health emergency.
- In June 2020, the InnovateNRC 2.0 initiative team conducted a virtual Innovate-a-Thon to formally launch the agency's new IdeaScale innovation platform, as well as to motivate staff participation by sharing success stories and launching crowdsourcing campaigns. So far, the platform has collected over 29 new ideas, and conducted 4 crowdsourcing challenges that have provided solutions to real-time staff assignments in different organizations. For example, the staff issued a crowdsourcing challenge on looking for new ideas to re-build the resident inspector program. The challenge was opened to the staff for 2 weeks to share their thoughts and ideas on how this program can be enhanced. The team received 34 suggestions and comments from all over the agency—including all four regions, NRR, NMSS, and RES. The team received ideas on the structure of the program, how to best leverage technology, and how to increase

quality of life for the resident inspectors. This experience demonstrated how successful crowd sourcing can be in a very short period of time.

- The Signposts and Markers initiative team identified 39 indicators to be tracked in an internal dashboard that will help us monitor factors that are most likely to affect our future work and that will support workforce planning.
- The culture initiative launched a first-of-its-kind culture survey that was designed to identify specific gaps between NRC's current culture and our desired culture. The team has shared the results agencywide through a series of WebEx sessions, and has developed an agencywide improvement plan to get to the agency desired culture.

## **Strategic Workforce Planning (OCHCO)**

The NRC implemented a Strategic Workforce Planning (SWP) process to improve workforce development to meet its near- and long-term work demands. This process projects the amount and type of work anticipated in the next 5 years and identifies the workforce needed to perform that work. By analyzing the current workforce and comparing it to future needs, skill gaps or surpluses can be identified. In the final step of the process, both short- and long-term strategies are developed to enable the agency to recruit, retain, and develop a skilled and diverse workforce with the competencies and agility to address both current and emerging needs and workload fluctuations.

In July 2017, the NRC initiated a three-office pilot project (known as Phase I) of an Enhanced Strategic Workforce Planning (SWP) process that better integrates workload projection, skills identification, human capital management, individual development, and workforce management activities.

A lessons-learned report found that the pilot project provided a sound, repeatable process that could be used to prepare a projection for staff of the anticipated type and amount of work in the pilot organizations. The pilot also demonstrated that the enhanced SWP process can identify short and long-term strategies and action plans to address gaps and overages in workforce needs.

In 2019 the agency implemented Phase II of SWP in 11 offices, including all four regions, NRR, NRO, NMSS, RES, NSIR, OCFO, and OCIO. This represented approximately 79% of the agency's workforce. Phase II demonstrated that the enhanced SWP framework and process will support agency efforts to better forecast the amount and type of work now and in the future, and the workforce needed to perform this work.

With the success of Phase II, the NRC has ended the "phased" implementation of the enhanced SWP and the process has become part of the agency's normal operating procedure. Beginning with FY 2020, implementation will begin each September, and will include all offices that report to the OEDO and three offices that report to the Commission including OCFO, OGC, and SECY.

More information on the SWP process and results can be found on the EDO SharePoint site "[EDO Enhancements to SWP](#)." (Internal SharePoint site: <https://usnrc.sharepoint.com/teams/EDO-Enhancements-Strategic-Workforce-Planning> )

## **Staffing, Retention, Recruiting, and Professional Development (OCHCO)**

### **Staffing/Retention/Recruiting**

The NRC's FY 2020 enacted budget included 2916 full time equivalents (FTEs) (excluding the Office of the Inspector General). Over the past few years, the Office of the Chief Human Capital Officer (OCHCO), in coordination with the NRC's Human Capital Council (HCC), has effectively guided the agency in taking a more disciplined approach to developing long- and short-term staffing strategies that not only address salary and benefits challenges, but also address position management challenges and anticipated reductions in FTEs.

A combination of external factors and internal drivers, such as increasing budgetary constraints, uncertainty about the type and amount of future work, and the significant number of NRC employees at or nearing retirement eligibility, continue to impact the current staffing environment. In FYs 2020 and 2021, external hiring will be driven by the results of the agency's new enhanced Strategic Workforce Planning (SWP) process. Through this process, the agency will align current and future hiring with projected workload forecasts to ensure that our hiring decisions are made with the future in mind. OCHCO will continue to engage the Strategic Workforce Oversight and Utilization Panel (SWOUP), a subset of the HCC, to provide agency leadership and guidance to accomplish the following objectives:

- Provide an agency-wide perspective to determine hiring priorities and strategies for addressing potential gaps, resolving competing talent needs, and making optimum use of existing talent; and
- Advise on workforce restructuring/workload balance.

The NRC has revamped an entry level hire program called the Nuclear Regulator Apprenticeship Network program. The new program uses a competency-based framework for training and targets entry-level hiring of graduating technically strong, diverse candidates, and is tied directly to anticipated skill gaps and/or hard-to-fill positions. For calendar year 2019, the NRC participated in 25 recruitment events of which 52 percent were focused on attracting diverse candidates. The NRC continues to proactively adjust the future recruitment schedule based on FTE and funding levels while keeping in mind mission-critical skill needs. The current schedule provides the agency with a mix of events focused on both entry-level/student vacancies and mid-career positions; a variety of schools with solid engineering and science programs; and schools and events that aid us in developing a diverse applicant pool to include minorities, women, veterans and disabled individuals. In addition, the agency advertises in trade journals and on web sites, with a focus on diversity, to attract professionals in specialized technical disciplines.

### **Professional Development**

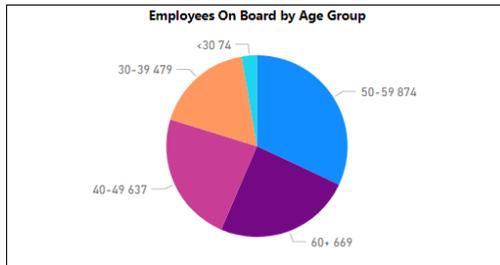
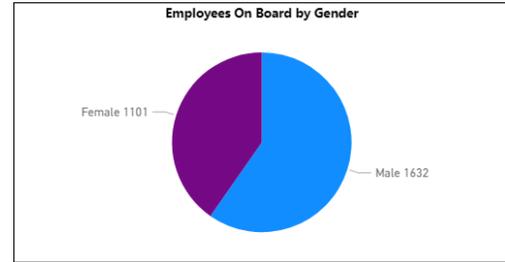
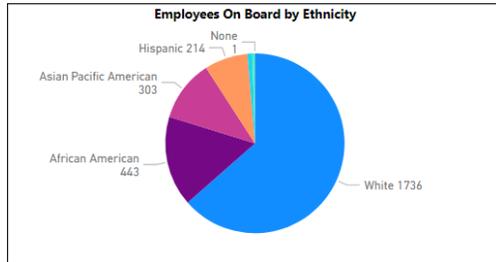
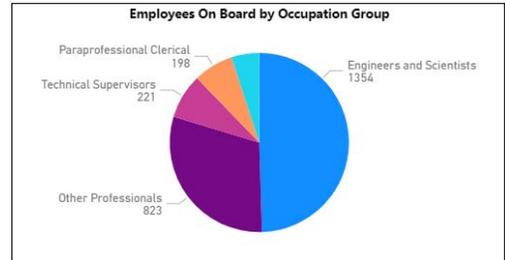
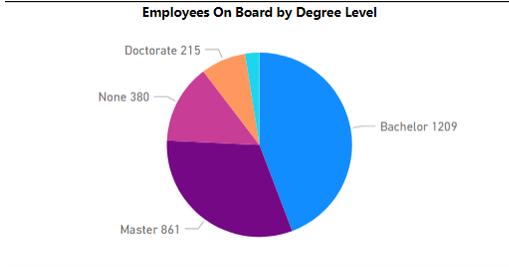
The agency offers a wide variety of instructor-led courses at both the Technical Training Center (TTC) in Chattanooga and at the Professional Development Center (PDC) in Headquarters. The majority of this training supports qualification requirements across a number of mission-critical programs. The NRC qualification program, as defined by Manual Chapters 1245, 1246, 1247, 1248, and 1252, consists of formal training, on-the-job training, and individual study activities. Much of the training supporting these qualification requirements has been instructor-led. However, in FY20, in response to COVID-19, OCHCO enhanced our training mission to develop and maintain workforce skills with the accelerated conversion of in-class training to

virtual delivery. OCHCO collaborated extensively with stakeholders to understand and successfully meet course demand including mandatory and qualification training needs for NRC and Agreement State staff. In FY20, almost 50 courses were converted to virtual instructor-led sessions and 98 offerings related to professional development have been delivered since April. As a result, NRC was positioned to continue to offer a robust schedule of leadership, professional and technical training that met stakeholder demands and workforce training and development needs.

The NRC also offers a variety of formal developmental programs including the Senior Executive Service Candidate Development Program (SESCDP), Supervisory Development Program, Aspiring Leaders Certificate Program (ALCP), and the Leader at All Levels Certificate Program (LCP).

The agency encourages the use of Individual Development Plans (IDPs) to identify ways for employees to broaden knowledge or close skill gaps, whether by formal training courses, rotational assignments, mentoring, or other developmental activities. The information from the IDPs can also be used as a roadmap to prepare employees for career growth. Employees can leverage information found in competency models that were developed for the NRC's core mission positions, by taking assessments to ascertain their proficiency level and to identify areas for development.

## US Nuclear Regulatory Commission (NRC) Workforce Composition (08/15/2020)



## **Policies for Equal Employment Opportunity (EEO) and Diversity (SBCR)**

### **Equal Employment Opportunity Policy**

It is the policy of the U.S. Nuclear Regulatory Commission (NRC) to foster equal employment opportunity and build and maintain a positive work environment through open and collaborative communication and mutual respect. In alignment with this policy, it is the NRC's goal to prevent and eliminate discrimination in the workplace for its employees as well as applicants for employment, based on various Federal civil rights statutes, regulations, and policies. The NRC demonstrates fairness and equity for all employees and job applicants, regardless of their race, color, religion, sex (including sexual orientation, gender identity, gender expression, and pregnancy), national origin, age, disability, marital status, parental status, political affiliation, military service, and genetic information.

The NRC works diligently to prevent employees and applicants from being subjected to reprisal for either participating in a protected activity or opposing practices made unlawful by the relevant civil rights statutes and regulations. Moreover, the NRC engages in collaborative efforts to prevent and eliminate workplace harassment.

The NRC will continue to be vigilant in cultivating a civil workplace that is free from discrimination, harassment, and retaliation by addressing and eliminating all forms of harassing behavior and misconduct, discrimination, and retaliation. All NRC employees must comply with all nondiscrimination laws and policies and are prohibited from engaging in discrimination that violates civil rights laws. In addition, managers and supervisors bear a greater responsibility in safeguarding equal employment opportunity for all employees by taking prompt and appropriate action to enforce this policy when incidents involving workplace harassment and discrimination are brought to their attention.

### **Diversity and Inclusion Policy**

It is the policy of the NRC to ensure that diversity, inclusion, and respect for every employee are integral parts of our day-to-day management and work. Executive Order (EO) 13583, "Establishing a Coordinated Government-wide Initiative to Promote Diversity and Inclusion in the Federal Workforce" (2011), is intended to promote the Federal Government as a model of equal opportunity, diversity, and inclusion. Additionally, NRC is aware of and taking steps to ensure we are in alignment with the requirements noted in EO 13950, "Combating Race and Sex Stereotyping."

At the NRC, we recognize that our most valuable assets are our employees; therefore, we are fully committed to diversity and inclusion initiatives. It is the NRC's policy that diversity and inclusion be considered in all agency program operations, including recruitment, hiring, promotion, advancement, and other selection activities, as well as developmental and training opportunities and interagency working groups.

The ability to deliver high-quality service is undeniably linked to sustaining an organizational culture that protects and empowers all employees. The Commission expects NRC management to set an example by creating and supporting an open, collaborative work environment that is inclusive and enables employees to receive the assistance needed to reach their fullest potential and use their diverse talents to achieve the agency's safety and security mission. However, it is also essential for every employee to participate in these efforts by understanding and valuing differences, cultures, and backgrounds.

### **The NRC's Differing Views Program (OE)**

The NRC strives to establish and maintain an environment that encourages all employees to promptly speak up and share concerns and differing views without fear of negative consequences. NRC employees understand that everyone has a role in safety and security and that we are all responsible for achieving our mission.

The routine approach for raising a differing view is through informal discussions. If informal discussions do not resolve the concerns, an employee has various mechanisms for expressing a differing view. The NRC uses a three-tiered system for formal expression of differing views: the Open Door Policy ([Management Directive 10.160](#)), Non-Concurrence Process (NCP) ([Management Directive 10.158](#)), and Differing Professional Opinion (DPO) Program ([Management Directive 10.159](#)). The Open Door Policy promotes early discussion of differing views and can be used to communicate with any NRC manager, beyond the employee's first-line supervisor. The NCP addresses concerns with a document that is in the concurrence process and allows an employee to raise concerns to management overseeing the issuance of the subject document before an official agency position is established. If an employee has a differing view with an established agency position, the DPO Program is used to document the concern for consideration by a panel of knowledgeable NRC employees and the appropriate Office Director or Regional Administrator. Providing NRC employees with multiple avenues for consideration of diverse views is critical to promoting participative decision making and being a modern, risk-informed regulator while successfully fulfilling our mission into the future.

## **NRC Whistleblower Protections (OCHCO)**

The “Whistleblower Protection Act of 1989” and the “Whistleblower Protection Enhancement Act of 2012” provide employees and applicants with the right to make whistleblower disclosures and ensure that those who do so are protected from retaliation. On October 26, 2017, the President signed into law S.585, the “Dr. Chris Kirkpatrick Whistleblower Protection Act of 2017” (the Act). The purpose of the Act is to “provide additional protections to Federal employees who are retaliated against for disclosing waste, fraud, or abuse in the Federal Government” and to ensure that all employees are aware of their rights and the protections afforded to them under the law.

It is unlawful to retaliate against an employee or applicant for making a protected disclosure. Retaliation for whistleblowing is one of fourteen prohibited personnel practices. Protection from whistleblower retaliation means it is unlawful for agencies to take, threaten to take, or fail to take a personnel action because the employee disclosed one or more of the six categories of Government wrongdoing listed below. Personnel actions can include, but are not limited to, actions such as poor performance reviews, demotions, suspensions, or terminations.

A "whistleblower" is an employee or applicant who discloses information that he or she reasonably believes evidences:

- A violation of any law, rule, or regulation;
- Gross mismanagement;
- A gross waste of funds;
- An abuse of authority;
- A substantial and specific danger to public health or safety; or
- Censorship related to scientific research if it meets one of the above-listed categories.

Most Federal employees and applicants are covered by whistleblower protections. In July 2019, OCHCO issued an updated Yellow Announcement (YA) to notify all Agency employees that whistleblower protections are available to them as Federal employees. The YA also reaffirmed that NRC leadership does not tolerate whistleblower retaliation or any other prohibited personnel practice.

NRC employees have many options when deciding to whom they will disclose wrongdoing including, but not limited to, making disclosures to management, the NRC’s Office of Inspector General (OIG), U.S. Office of Special Counsel (OSC), or Congress. For whistleblower disclosures involving classified national security information or other information protected from public release by law (e.g., patient privacy information or certain proprietary information), whistleblowers must use confidential channels such as OIG, OSC, or Congress to be protected from adverse personnel actions related to the disclosures.

Although the Energy Reorganization Act bars the NRC from retaliating against employees who engage in protected whistleblower activity, the agency, supported by the Department of Justice and the Department of Labor, has taken the position in court that it is not subject to suit under the ERA because there has been no waiver of sovereign immunity. Two cases challenging that position are pending as of September 2020.

Pursuant to 5 U.S.C. § 2302(c), the Dr. Chris Kirkpatrick Whistleblower Protection Act, and the Office of Special Counsel Reauthorization Act of 2017, the NRC is required to submit to OSC a completed and signed Certification Program Registration Form confirming compliance with whistleblower protection laws and OSC regulations. The NRC will submit the next form in the

spring of 2021. Also, as required by the OSC, updated training on the updated protections under the law was provided to all Agency supervisors. In addition, updated OSC posters were printed and displayed throughout NRC facilities. New employee orientation was also updated with the most current information.

OCHCO is awaiting guidance from the Office of Personnel Management and OSC on the inclusion of whistleblower protection criteria in supervisory performance appraisals. Once the guidance is received, OCHCO will coordinate its inclusion into applicable Agency policies.

The NRC Office of the Inspector General has the responsibility to educate Agency employees about prohibitions on retaliation for protected disclosures and rights and remedies against such retaliation.

## **Nuclear Energy Innovation and Modernization Act (NEIMA) (OEDO)**

On January 14, 2019, President Trump signed into law the “Nuclear Energy Innovation and Modernization Act” (Public Law 115-439) (NEIMA). NEIMA has several provisions, all of which are focused on the NRC and may impact all parts of the agency.

NEIMA has three objectives:

1. provide a revised framework for fee recovery by the NRC “to ensure the availability of resources to meet industry needs without burdening existing licensees unfairly for inaccurate workload projections or premature existing reactor closures”;
2. promote the development of expertise and regulatory infrastructure necessary to allow innovation and commercialization of advanced nuclear reactors; and
3. foster “more efficient regulation of uranium recovery”.

NEIMA requires the NRC to take several actions, with varying timelines for expected completion. A listing of major activities, along with their anticipated completion dates and current status follows below.

<b>Task</b>	<b>NEIMA Reference</b>	<b>Completion Date</b>	<b>Status/Notes</b>	<b>Associated Link/ADAMS Accession Number</b>
Reprisal Study Report	Section 109	Apr-19	Complete	ML19044A645
Baffle-Former Bolt Guidance Assessment	Section 104	Apr-19	Complete	ML19078A017
Baffle-Former Bolt Report	Section 104	Apr-19	Complete	ML19078A017
Uranium Recovery Report	Section 201	Apr-19	Complete	ML19074A210
Lessons from Recent Evacuations Report	Section 105	July-19	Complete	ML19123A270
Performance Metrics for "Requested Activities of the Commission"	Section 102	July-19	Complete	ML19022A376 (Non-Public) Public: <a href="https://www.nrc.gov/about-nrc/generic-schedules.html">https://www.nrc.gov/about-nrc/generic-schedules.html</a>
Expediting & Establishing Stages in Licensing Process for Advanced Reactors	Section 103	July-19	Complete	ML19128A289
Risk-Informed & Performance-Based Evaluation Techniques/ Guidance for Advanced Reactors Report	Section 103	July-19	Complete	ML19128A289
Training/Hiring for Advanced Reactors	Section 103	Sep-19	Complete	ML19184A143*

\*=not publicly available

Stages in Licensing Process for Advanced Reactors	Section 103	Oct-19	Complete	ML19128A289
Corporate Support Caps	Section 102	Dec-19	Completed- included in FY 2021 Congressional Budget Justification. Will be updated annually.	ML20024D764/ ML20024D751
Anticipated Expenditures for "Requested Activities of the Commission"	Section 102	Dec-19	Completed- included in FY 2021 Congressional Budget Justification. Will be updated annually.	ML20024D764/ ML20024D751
Budget Authority for "Requested Activities of the Commission"	Section 102	Dec-19	In Progress-included in FY 2021 Congressional Budget Justification. Will be updated annually.	ML20024D764/ ML20024D751
Licensing Process for RTRs Report	Section 103	Jan-20	Complete	ML19324F358
Accident Tolerant Fuel Report	Section 107	Jan-20	Complete	ML19319A79
Voluntary Pilot on Flat Fee for Uranium Recovery	Section 202	Jan-20	Complete	ML20010D604
Community Advisory Boards Report	Section 108	July-20	Complete	ML20122A112
Fees to collect Budget Authority	Section 102	Sep-21	In Progress	
Increased Use of Risk-Informed, Performance-Based Licensing Evaluation Techniques/ Guidance for Advanced Reactors	Section 103	Jan-21	In Progress	
RTR Strategies for Predictable, Efficient & Timely Reviews	Section 103	Dec-20Jan-21	In Progress	
Regulation Modification for Fee Disputes	Section 102	May-21	In Progress	
Review and Approval of invoices for Service Fees	Section 102	May-21	Complete	ML20184A122*

\*=not publicly available

Part 53 Rulemaking to establish technology inclusive framework for in Commercial Advanced Nuclear Reactor Technologies in New Reactor License Applications	Section 103e	July -21	In Progress (submitted SECY to the Commission with Commission)	
Processes to audit invoices	Section 102	Aug-21	Complete	ML20184A122*
NEIMA Budget, Fee, and Performance Related Provisions Report	Section 102	Sep-21	In Progress	
Final Rule to Amend NRC regulations related to cost recovery by RTRs	Section 106	May-24	In Progress; Rulemaking Plan submitted to the Commission (SECY-20-0042)	
Final Rule for Technology Inclusive Advanced Reactor Rulemaking	Section 103	Dec-27	In Progress; Rulemaking Plan submitted to the Commission (SECY-20-0032)	
Continued Advance Reactor Regulatory Infrastructure Activities Funding Report	Section 102	Dec-29	Not yet started	

## **Nuclear Energy Innovation Capabilities Act (NEICA) (OEDO)**

In October 2019, NRC and DOE entered a memorandum of understanding to implement key provisions of NEICA - Public Law 115-248.

NEICA was signed into law in September 2018, and

- required the NRC and DOE to enter into a memorandum of understanding regarding technical expertise, modeling, and facilities related to advanced reactors;
- authorized the NRC and DOE to enter into a memorandum of understanding in additional areas related to advanced reactors and new nuclear technologies; and
- authorized the National Reactor Innovation Center—a DOE program designed “to enable the testing and demonstration of reactor concepts to be proposed and funded, in whole or in part, by the private sector.”

NRC and DOE are continuing to strengthen technical exchange and collaboration in the following areas:

- Readiness for Advanced Reactors – DOE and NRC are actively engaged on technical issues and investment needs to support future deployment and licensing (e.g., DOE is leveraging NRC expertise regarding safety analyses needed to support regulatory reviews).
- Integrated Planning on Development and Investment in Computer Codes – NRC and DOE continue to develop and implement plans to ready computer codes to review advanced reactor and micro-reactor designs.
- Advanced Fuel Campaign – NRC and DOE staff continue to identify the technical data needed to demonstrate performance of new fuel types to support future licensing and deployment of higher burnup and increased enrichment fuel (including accident tolerant fuel).
- Technical Exchange of Staff – NRC and DOE research organizations are planning for staff exchanges to develop expertise and enhance cooperation with National Laboratories (including exchanging experts in cyber security, advanced manufacturing, and the versatile test reactor project).
- Advanced Manufacturing – NRC staff is actively observing and learning about the technologies under development, including DOE's Transformational Challenge Reactor, which has a goal of printing a small reactor core.
- Advanced Reactor Demonstration Program - NRC plans to provide regulatory and technical expertise to the DOE program, which has the goal of constructing advanced designs.

## **Foundations for Evidence-Based Policymaking Act (OEDO)**

On January 14, 2019, the President signed, into law the Foundations for Evidence-Based Policymaking Act of 2018 (Evidence Act) (Pub. L. 115-435; 132 STAT. 5529). The Evidence Act amends titles 5 and 44 of the United States Code (U.S.C.) and, among other things, emphasizes collaboration and coordination to advance data and evidence-building functions by statutorily mandating evidence-building activities, open government data, and confidential information protection and statistical efficiency.

The Evidence Act requires each agency to designate a Chief Data Officer (CDO), an Evaluation Officer (EO), and a Statistical Official (SO). These Evidence Act officials are responsible for overseeing the use of data and evidence-building activities for the agency, in coordination with the head of the agency or his or her designee. In August 2019, the Executive Director for Operations (EDO) designated David Nelson, Chief Information Officer, as the CDO; Raymond Furstenau, Director, Office of Nuclear Regulatory Research (RES) as the EO; and Michael Case, Director, Division of Systems Analysis, RES, as the SO (ADAMS Accession No. [ML19193A036](#)). In September 2019, under the direction of the EDO, the Office of the Chief Information Officer chartered and established the Data Governance Board (ADAMS Accession No. [ML19261A094](#)) to comply with the Evidence Act. The CDO chairs the Data Governance Board, which includes the EO, the SO, and senior-level staff. The Data Governance Board ensures that the NRC is setting priorities for managing data as a strategic asset in service to the agency's mission. In October 2019, Office of the Executive Director for Operations also established an Evidence Act Working Group (EAWG) to assist in implementing the requirements of the Evidence Act (ADAMS Accession No. [ML19273B738](#)).

The Evidence Act requires Chief Financial Officers (CFO) Act agencies, of which NRC is one, to have a learning agenda and a capacity assessment that cover a 4-year period aligned with the agency strategic plan. The Evidence Act also requires agencies to include in their strategic plan, a learning agenda, which is a plan for identifying and addressing questions relevant to the programs, policies, and regulations of an agency. Once a learning agenda is implemented, decisionmakers can use the results to guide choices to improve the agency's programs, policies, and regulations. The learning agenda is intended to emphasize and foster an agency culture of learning and continuous improvement.

In addition to the learning agenda, the Evidence Act requires agencies to include a capacity assessment in their strategic plans. The capacity assessment is expected to allow agencies to "improve the agency's ability to support the development and use of evaluation, coordinate and increase technical expertise available for evaluation and related research activities within the agency, and improve the quality of evaluations and knowledge of evaluation methodology and standards."<sup>1</sup> The Evidence Act requires agencies to provide a list of existing activities (e.g., programs and initiatives) and operations (e.g., administrative and support tasks) that are being evaluated or analyzed.

The Evidence Act also requires CFO Act agencies to develop an annual evaluation plan that describes the collection and analysis of information on the characteristics and outcomes of programs, projects, and processes to improve effectiveness and to inform decisionmakers about

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<sup>1</sup> Office of Management & Budget, M-19-23, "Phase 1 Implementation of the Foundations for Evidence-Based Policymaking Act of 2018: Learning Agendas, Personnel, and Planning Guidance," July 10, 2019

current and future activities. The NRC's draft annual evaluation plan is to be submitted to the Office of Management and Budget (OMB) in September of each year, concurrent with the submission of the NRC's Annual Performance Plan,<sup>2</sup> and published with the evaluation plans along with the Annual Performance Plans the following February.

OMB guidance also required agencies to initially develop an interim learning agenda and interim capacity assessment concurrent with the fiscal year 2022 Annual Performance Plan submission in September 2020, which coincided with the submission of the FY 2022 budget. On September 14, 2020, the NRC submitted to OMB an Interim Learning Agenda, Interim Capacity Assessment, and Annual Evaluation Plan approved by the Commission in the Staff Requirements Memorandum issued with respect to SECY-20-0067.<sup>3</sup>

The staff is developing a new Management Directive (MD) for evidence-building. The evidence-building and evaluation MD is expected to be completed by Spring 2021 and will be provided to the Commission for information prior to it being finalized. The staff is also developing an evidence-building and evaluation implementation plan to ensure that current agency activities and initiatives (e.g., Strategic Workforce Planning, Competency Modeling) are fully leveraged to assist in complying with the requirements of the Evidence Act.

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<sup>2</sup> The GPRA [Government Performance and Results Act] Modernization Act of 2010, codified at 31 U.S.C § 1115(b), also requires annual performance plans. The NRC currently includes its annual performance plan as part of its annual Congressional Budget Justification. See NUREG-1100, Volume 36, Revision 1, "Congressional Budget Justification Fiscal Year 2021," at 95, issued February 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. [ML20024D764](#)).

<sup>3</sup> Staff Requirements – SECY-20-0067 – Foundations for Evidence Based Policymaking Act of 2018: Interim Learning Agenda, Interim Capacity Assessment, and Annual Evaluation Plan, September 9, 2020 ([ML20253A028](#)).

### **White Flint Campus (ADM)**

NRC's safety and security mission includes a broad variety of functions. Many of these functions require workspace and special facilities, such as secure hearing space, incident response centers, technical and law libraries, a public document room, public meeting facilities, and numerous collaborative workspaces. To support these functions the NRC occupies space, leased or owned by the General Services Administration (GSA), at the White Flint Campus (WFC) headquarters (three office buildings and a warehouse), four regional offices, and a Technical Training Center.

In 2006, in response to the industry's renewed interest in building new commercial nuclear power plants, the NRC projected a need for additional staff who could not be housed in the existing two office buildings at WFC. In response, GSA obtained leases on behalf of NRC in three additional Rockville office buildings and requested approval to acquire a third building. In December 2007, the President signed an appropriations law that allowed the NRC to obtain the Three White Flint North (3WFN) building. The 3WFN building, consisting of 321,000 useable square feet, delivered in November 2012.

Over the following years, the anticipated new reactor applications did not materialize at the expected levels, and NRC's housing requirements began to decline rather than increase. As a result, NRC required significantly less space at its Rockville headquarters, particularly space in 3WFN. Pursuant to the occupancy agreement between the NRC and GSA for 3WFN, NRC is responsible for the rent payments for the entire building minus the amount a backfill tenant pays, if applicable, until the termination of the lease in November 2027.

During the same timeframe, the federal government instituted new guidelines for improving the utilization of federal real property. Memoranda issued by the Executive Office of the President referred to as "Freeze the Footprint" and "Reduce the Footprint" were later codified by the Federal Property Management Reform Act of 2016 and the Federal Assets Sale and Transfer Act of 2016, which required the NRC to set annual square foot reduction targets over a rolling 5-year period as well as requiring identification and adoption of an office space design to optimize office space usage.

Additionally, the Nuclear Energy Innovation and Modernization Act (NEIMA) caps corporate support costs for the NRC, which include workspace and the associated lease and utility fees, in the budget request, to the maximum extent practicable, to 30 percent of the total budget authority requested for the NRC beginning in Fiscal Year (FY) 2021. Then, in the President's FY 2023 and 2025 budgets, the cap on corporate support costs is further reduced to 29 and 28 percent, respectively. A significant portion of NRC's corporate support costs are utilized for space and associated lease and utility fees.

In response to the above-described factors, since 2014 the NRC has been in the process of reducing its real estate portfolio at both headquarters and the regions. The NRC and GSA have successfully placed backfill tenants (the Food and Drug Administration (FDA) and the National Institutes of Health (NIH)) into twelve and a half floors of 3WFN to offset most of NRC's rental costs. Currently, the NRC occupies an underground Incident Response Center, a Data Center, and a conference facility in 3WFN. The conference center located on the lobby level is scheduled to be backfilled by NIH in FY 2021 in furtherance of NRC planned footprint and lease cost reductions. NRC staff who previously were located in 3WFN are now located in newly renovated space in the Two White Flint North (TWFN) building.

In addition to the reductions at the White Flint Campus, the NRC plans to reduce space in regional offices (which are currently built out in a primarily enclosed office format) from FY 2020 through FY 2023, by consolidating in place and releasing blocks of space in Regions II (Atlanta, GA), III (Lisle, IL), and IV (Arlington, TX). Also, Region I (King of Prussia, PA) is currently working with GSA to reduce half their current space by converting from enclosed offices to a more open space design model. Per the current strategy, by FY 2023, the NRC will have released a total of 231,000 useable square feet of space, 141,000 of which is scheduled to be released in the FY 2021 to FY 2023 timeframe. Once released, the agency expects to realize annual rent savings of \$9.2M and an accompanying reduction of \$0.9M in related security costs.

To address and define the future space needs of the agency, at the direction of the Commission, the NRC staff is preparing a Space Roadmap of the Future to address renovations, budget considerations, changes as a result of the COVID-19 public health emergency, and future space reductions.

## **Social Media (OPA)**

The Office of Public Affairs (OPA) manages the agency's social media program. The program was initiated in January 2011 and has grown in platforms and reach since then. The program currently consists of a Twitter account, Facebook page, YouTube channel and Flickr image gallery. OPA generates unique content on the platforms to support NRC communication goals and uses the platforms to reinforce more traditional means of external communication, such as news releases. The social media platforms are prominent in OPA's crisis communication strategy and simulated during exercises. OPA also provides content to the agency's LinkedIn account, which is managed by the Office of the Chief Human Capital Officer.

NRC's main Twitter account, launched in August 2011, is a key component of the social media program. It creates synergy between the agency website and other social media platforms. The agency uses Twitter to send announcements on news releases, YouTube videos, public meetings and other communication vehicles. The agency has sent thousands of "tweets" and has more than 12,000 followers. Many of the followers regularly "re-tweet" the information, greatly broadening the audience. During an emergency event, Twitter would be a prominent tool for communicating with both the media and the public.

Social media sites have proved to be an effective and dynamic way for the NRC to communicate with a broader spectrum of the public, and in 2013, OPA incorporated a method for quantifying social media outreach success using metrics developed by GSA and adapted appropriately to the NRC's program. OPA also monitors social media as a "listening" tool to inform other public communication tools, and to assess public concerns and questions about NRC-related matters.

In its efforts to evolve communication strategies to meet the demands of the digital age, OPA continues to analyze and assess additional platforms, although at this time, the four current platforms are working well to meet agency needs.

## **NRC's Response to the COVID-19 Public Health Emergency – NRC Operational Impact (OEDO)**

### **Protecting the NRC Workforce**

On January 31, 2020, the U.S. Department of Health and Human Services declared a public health emergency (PHE) for the United States in response to COVID-19 and on March 11, 2020, the COVID-19 outbreak was characterized as a pandemic by the World Health Organization. The NRC's efforts supported the health and safety of the NRC workforce while enabling the agency to continue to effectively perform its mission to protect public health and safety, common defense and security, and the environment.

The Executive Director for Operations chartered the NRC COVID-19 Task Force to take precautionary measures and develop tools in response to COVID-19 PHE to help protect the health and safety of the NRC workforce in accordance with guidance provided by the federal government, including the Centers for Disease Control and Prevention (CDC), as well as consideration of state and local conditions. The Task Force and the associated Working Group assessed guidance from the Office of Management and Budget, the Office of Personnel Management (OPM), the CDC, other applicable guidance, and other agencies' COVID-19 activities and developed the NRC Re-Occupancy Plan, Re-Occupancy Guidance document, and required Re-Occupancy training. Offices completed several key activities to ensure the agency continued to meet its mission in a mostly virtual environment with up to 98% of NRC employees in a telework status, including:

- Used supplemental funding to increase our bandwidth to enable a maximum capacity of 4,000 connections with 3,400 to 3,700 individuals connecting to our network remotely on a typical workday.
- Assessed and implemented changes to facility operations, workplace safety strategies, acquisition of personal protective supplies and cleaning services, and security access controls to help keep our buildings safe and respond quickly to COVID-19 situations.
- Provided maximum telework and expanded schedule flexibilities to address the challenges and needs of our workforce, such as the ability to complete a tour of duty in a "24 hours per day/6 days per week" time frame. The agency revised its telework guidance and created a new streamlined telework agreement form for use during the PHE, NRC Form 626.
- Established and populated intranet and SharePoint sites so both virtual private network and Office 365 users would have easy access to information on the sites. The agency posted approximately 100 Frequently Asked Questions, 60 COVID-19 Bulletins, and 100 "Staying Connected at a Distance" Posts (some including podcasts) to keep employees informed and help them stay connected.
- Solicited staff input with surveys in May, June, and September to gauge general staff preferences for work location, schedules, and other resources/services as we continued in and beyond the COVID-19 pandemic environment. The surveys assisted in ensuring that the workplace was ready for employees to return and will continue to inform planning efforts.

On September 21, 2020, the Office of the Inspector General issued OIG-20-A-16, "Audit of the NRC's Employee Reentry Plans." The audit found that the NRC's employee reentry plans were in accordance with government-provided guidance and agreed-upon best practices. The audit also found that that the NRC developed processes to address specific conditions facing NRC resident inspectors and regional-based team inspectors.

## **NRC's Response to the COVID-19 Public Health Emergency - Reactors (NRR)**

On January 31, 2020, the U.S. Department of Health and Human Services declared a public health emergency (PHE) in response to the Coronavirus Disease 2019 (COVID-19). Following declaration of the COVID-19 PHE, the NRC began taking all necessary steps to protect public health and safety, including the identification of regulatory requirements that could pose challenges during the PHE, and the areas where the staff believed that temporary flexibilities, such as exemptions, would not compromise the ability of licensees to maintain the safe and secure operation of NRC-licensed facilities. The NRC staff held multiple public teleconferences with stakeholders to seek information and to identify areas where requests for regulatory relief may be needed and whether expedited NRC decisions would be requested. The NRC staff then issued letters communicating the site- and situation-specific information that would be needed for reviews of exemption requests to be expedited.

The NRC continues to monitor the effects of the COVID-19 PHE on NRC-licensed activities as well as actions taken in response to local conditions and will continue to take appropriate regulatory steps as needed. To date, the COVID-19 PHE has not resulted in safety issues or events at any NRC-licensed facility. If the NRC identifies any facility where the impact of the COVID-19 PHE creates concerns about continued safe operation, the agency will take necessary steps to ensure public health and safety.

### **NRR COVID-19 Coordination Team (NCCT)**

Following the declaration of the COVID-19 PHE, the Office of Nuclear Reactor Regulation (NRR) established the NCCT. The NCCT is led by NRR's Division of Operating Reactor Licensing and Division of Reactor Oversight and is responsible for:

- Maintaining the status of anticipated reactor licensing and inspection activities in response to the COVID-19 PHE;
- Identifying any challenges to completing NRR's mission-related work, changes in priorities, or resource shifts in light of the COVID-19 PHE;
- Serving as the point of contact for matters raised by the industry and members of the public pertaining to COVID-19 reactor-related issues;
- Facilitating meetings with reactor industry representatives on PHE-related matters; and
- Identifying possible efficiencies for addressing COVID-19-PHE-related work such as approaches to streamline review and approval of relief requests for sites with refuelling outages.

### **Licensing**

As described above, the NRC staff established and communicated additional criteria describing the conditions under which it would expedite licensee requests for exemption from certain regulatory requirements as a result of the COVID-19 PHE. The staff also provided guidance for enforcement discretion under certain circumstances to allow licensees time to submit requests for regulatory relief. However, the agency's standard for granting such regulatory relief remains unchanged, and each request is reviewed on a case-by-case basis; the NRC may only grant exemptions that meet the requirements in the relevant part of the agency's regulations. Granting temporary relief from certain regulatory requirements does not relieve a licensee of its obligation to ensure the safe and secure operation of its facility. The NRC's expeditious review and, if warranted, approval of these requests under the current circumstances enables

licensees to take necessary measures to follow Federal, State, and local public health guidelines.

As of October 31, 2020, letters have been issued for seven regulatory areas, providing additional information related to requests for exemptions from the following regulations in Title 10 of the *Code of Federal Regulations* (CFR):

- Work hour controls (10 CFR 26) (ADAMS Accession Nos. ML20087P237 and ML20098B333);
- Licensed operator requalification program and medical examinations (10 CFR 55) (ADAMS Accession No. ML20104C071);
- Security personnel training and qualification and force-on-force exercises (10 CFR 73) (ADAMS Accession Nos. ML20105A483 and ML20273A117);
- Respirator fit testing and medical exam requirements (10 CFR 20) (ADAMS Accession No. ML20099G757);
- Fire protection requirements (10 CFR 50.48) (ADAMS Accession No. ML20122A022);
- A reporting requirement on outage activities, namely the Owners Activities Report (10 CFR 50.55a) (ADAMS Accession No. ML20098D975); and
- Full participation biennial emergency preparedness exercise requirements (Parts 30, 40, 50, 52, 70, and 72) (ADAMS Accession Nos. ML20120A003 and ML20223A152).

As of October 31, 2020, a total of 141 reactor licensing requests related to COVID-19 have been approved:

- 95 exemptions granted (7 of which are for non-power reactors);
- 17 license amendments issued (1 of which was for a non-power reactor);
- 24 relief requests approved; and
- 5 other actions related to topical report revisions and approval letters for revisions to quality assurance programs were issued.

### **Innovating to Accomplish Our Mission**

The COVID-19 PHE underscored the importance of adapting in a dynamic environment. It served as a catalyst to accelerate innovations advancing the NRC in its journey to becoming a more modern, risk-informed regulator. For example, a public website (<https://nrcweb.nrc.gov/about-nrc/covid-19/>) was created to provide a centralized portal for information on NRC's actions in response to requests for regulatory relief, opportunities for public engagement, and frequently asked questions. Also, a web-based submission portal was developed for licensees to submit COVID-19 regulatory relief requests via the NRC's public website; traditionally only written submittals were available.

## **NRC's Response to the COVID-19 Public Health Emergency - Materials (NMSS)**

### **Background**

On January 31, 2020, the U.S. Department of Health and Human Services declared a public health emergency (PHE) for the United States to aid the nation's healthcare community in responding to COVID-19. On March 11, 2020, the COVID-19 outbreak was characterized as a pandemic by the World Health Organization.

On April 7, 2020, the Director, Office of Nuclear Material Safety and Safeguards sent a letter to nuclear material licensees (ADAMS Accession No. ML20094G166), that recognized that during the current COVID-19 PHE, licensees may experience challenges in meeting certain regulatory requirements. To address these challenges, the NRC has multiple methods of providing relief from regulatory requirements while continuing to maintain safety and security. These methods fall broadly into different categories, which include exemptions from regulatory requirements, amendments to license conditions or technical specifications, and enforcement discretion. Each method has specific requirements and is appropriate under certain circumstances.

### **Fuel Cycle Facilities**

In late March 2020, fuel cycle facility licensees expressed concerns with meeting certain regulatory requirements and license commitments while following CDC's social distance recommendation and other guidance and restrictions imposed by State and local governments. The areas potentially affected by the COVID-19 PHE include annual force on force exercises, annual emergency preparedness exercises, and conducting annual special nuclear material inventories.

The staff is using its existing authority to consider granting an exemption if the NRC determines the exemption (1) is authorized by law, (2) will not endanger life or property or the common defense and security, and (3) is otherwise in the public interest. On April 22, 2020, the staff held a public meeting with fuel cycle licensees to discuss how licensees can request temporary regulatory relief during the COVID-19 PHE through submission of exemption requests and the NMSS exemption review process, and to hear from fuel cycle licensees regarding the types of exemptions they may need during the ongoing PHE.

For fuel facilities, there are no current issues. All facilities are operational and taking precautions consistent with CDC guidance. As of August 24, 2020, relief requests resulted in 7 amendments being issued. Information on these temporary exemptions are available on NRC public Website: <https://www.nrc.gov/about-nrc/covid-19/materials/>. Fuel facilities have not identified a need for additional relief at this time.

The NRC issued Temporary Staff Guidance No.: TSG-DFM-2020-01, Fuel Facility Requests for Regulatory Relief Related to COVID-19, on April 21, 2020 (ADAMS Accession No. ML201089E911). It contains the guidance and procedures for the NRC staff for processing any future relief requests.

### **Independent Spent Fuel Storage Installation**

In late March 2020, many independent spent fuel storage installation (ISFSI) licensees expressed concerns with meeting certain regulatory requirements and license commitments

while following CDC's social distance recommendation and other guidance and restrictions imposed by State and local governments. The areas potentially affected by the COVID-19 PHE include annual physical examination and weapon requalification for security personnel, annual refresher training, the biennial emergency preparedness exercise, and annual special nuclear material inventory.

The staff is using the existing authority to consider granting an exemption if the NRC determines the exemption (1) is authorized by law, (2) will not endanger life or property or the common defense and security, and (3) is otherwise in the public interest. On May 8, 2020, the staff held a public meeting with ISFSI licensees to discuss how ISFSI licensees can request temporary regulatory relief during the COVID-19 PHE through submission of exemption requests and the NMSS exemption review process, and to hear from ISFSI licensees regarding the types of exemptions they may need during the ongoing PHE.

All facilities are operational and taking precautions consistent with CDC guidance. As of August 24, 2020, NMSS granted temporary exemptions to five ISFSI licensees. Most of these temporary exemptions are related to security personnel's annual physical examinations and requalification training. Information on these temporary exemptions is available on NRC's public Website: <https://www.nrc.gov/about-nrc/covid-19/materials/>. Consistent with other similar COVID-19-PHE-related temporary exemptions, these temporary exemptions expire by December 31, 2020, or 90 days after the termination of the PHE by the Department of Health and Human Services, whichever occurs first. The licensees may request an additional exemption if unable to meet the regulatory requirements prior to the expiration of the exemption.

### **Nuclear Materials Users**

Due to the COVID-19 PHE, the Division of Materials Safety, Security, State, and Tribal Programs engaged its licensees and the Agreement States to determine what regulatory actions would be warranted. In late March 2020, staff reviewed and issued its first exemption request related to the COVID-19 PHE. Staff approved the American Society for Nondestructive Testing's request for an extension of radiographer certifications that were set to expire between March and May 2020. Section II.5 of Appendix A to 10 CFR Part 34 requires that independent certifying organizations provide a radiography certification period of not more than 5 years.

Subsequently, staff developed exemption templates and guidance to assist NRC staff reviewers in evaluating requested temporary exemptions, while maintaining safety and security. The staff also shared the exemption templates and guidance with the Agreement States to promote consistent regulatory actions. Staff issued letters on April 14, 2020 (ADAMS Accession No. ML20104C115) and on May 5, 2020 (ADAMS Accession No. ML20126G385), describing regulatory requirements from Parts 19, 20, 30 and 35 for which the NRC may consider expedited requests for temporary exemption, and describing the NRC review process. Staff issued letters on May 15, 2020 (ADAMS Accession No. ML20133K127) and May 20, 2020 (ADAMS Accession No. ML20134H934) describing regulatory requirements from Parts 30 and 34, and Part 37, respectively, for which the NRC may consider expedited requests for temporary exemption, as well as the NRC review process. Staff continues to update the list of temporary exemptions, based on exemption requests received from licensees. Staff in NMSS and the Regional Offices issued over 30 exemptions to NRC materials licensees, between April and August 2020. Several materials licensees have already requested extensions to these exemptions. All approved exemptions are listed on the NRC public website (<https://www.nrc.gov/about-nrc/covid-19/materials/med-indust-academic.html>).

Staff also worked in concert with the Office of Enforcement (OE) to issue an enforcement guidance memorandum, EGM-20-002 (ADAMS Accession No. ML20083K794), to provide guidance for the disposition of violations of NRC requirements during the COVID-19 PHE. Based on the need for appropriate flexibility in responding to the changing events of the PHE, the NRC developed this EGM to allow for the periodic addition, in the form of separate attachments, of additional guidance on a topic-by-topic basis. Attachment 2 to EGM-20-002 granted enforcement discretion to inspection staff to not cite certain failures to comply with 10 CFR Parts 30 to 36, and 39 by a licensee that chooses to suspend use of licensed material and has placed and maintained all licensed radiological material in safe storage in accordance with applicable requirements during the COVID-19 PHE. The provisions of EGM-20-002 Attachment 2 apply to noncompliances that occurred since the declaration of the PHE and not more than one year from the issuance of the EGM. Staff is currently working on another EGM to address regulatory relief for operating medical licensees during a potential resurgence of COVID-19.

Staff also engaged stakeholders, including the public, industry, and the Advisory Committee on Medical Uses of Isotopes (ACMUI) through four public meetings conducted between April 22, 2020 and May 5, 2020. During these meetings, staff described the process to provide temporary relief to materials licensees. Staff from NMSS, the Regional Offices, OGC, ACMUI, and from the Agreement States participated in these public meetings.

Staff worked closely and maintained a strong partnership with the Agreement States, as well as with the Organization of Agreement States (OAS) and the Conference on Radiation Control Program Directors to ensure material safety and security, and compatible approaches across the National Materials Program. OAS shared with NRC and posted on their website (<https://www.agreementstates.org/covid-19-response.html>) actions taken by Agreement States in response to the PHE. On April 7, 2020, staff shared with Agreement States, Non-Agreement States, and Regional Offices, a list of questions and answers to the most frequently raised questions and concerns received from regulatory partners (ADAMS Accession No. ML20092H614). These questions addressed a diversity of topics, including NRC course offerings, NRC conduct of inspections and pre-licensing site visits, regulatory relief considerations, and implications to the implementation of the Integrated Materials Performance and Evaluation Program (IMPEP). Staff continues to revise and update the questions and answers, as needed.

Representatives from the Agreement States also participated in public meetings with licensees. Although several in-person course offerings were postponed due to the PHE, staff worked with the Technical Training Center to transition several NRC courses from in-person to remote instruction to ensure Agreement State staff could continue their qualification process. NRC staff also adjusted activities and schedules related to the IMPEP, in partnership with the impacted Agreement States. After the Agency's transition to mandatory telework, staff conducted remote periodic meetings, IMPEP reviews and Management Review Boards. On August 24, 2020, staff issued for comment a draft temporary instruction (TI), in coordination with OAS, to provide IMPEP teams guidance on how to consistently review NRC and Agreement State Program performance areas adversely affected by the PHE (ADAMS Accession No. ML20196L763). The TI will be issued in Fall 2020.

## **NRC's Response to the COVID-19 Public Health Emergency - Inspections (NRR and NMSS)**

### **NRR**

The NRC's program to inspect, measure, and assess the safety and security performance of operating commercial nuclear power plants, and to respond to any decline in their performance is known as the Reactor Oversight Process (ROP). NRC inspection activities are used to verify licensee compliance with Commission regulations and thus ensure public health and safety. For example, part of the agency's reactor inspection program includes at least two onsite inspectors (resident inspectors) at each plant that observe daily plant activities. Additionally, a general practice for U.S. commercial nuclear power plants is to shut down every 18 to 24 months to replace some of the fuel in their reactors. These refueling outages are also opportunities to perform necessary inspections, repairs, and maintenance.

When considering changes needed to our inspection approach during the COVID-19 public health emergency (PHE), priority was given to protect the health and safety of inspectors, site personnel, and the community while maintaining risk-informed oversight that supports reasonable assurance of adequate protection of public health and safety. The NRC staff has implemented a flexible strategy for NRC resident inspector site coverage to continue to perform plant inspections. The NRC is monitoring site-specific conditions, including COVID-19-related conditions onsite and in the surrounding community, and adjusting the inspection frequency as necessary. When not onsite, NRC resident inspectors are able to independently monitor licensee activities remotely using technology to access plant information necessary to perform the agency's independent oversight role. NRC resident inspectors have also increased their communication with licensees since the start of the COVID-19 PHE. Together, these efforts have allowed the NRC to continue its independent oversight of licensed facilities.

The NRC issued initial inspector guidance in a memorandum dated March 19, 2020, and later modified on April 6, 2020, "Resident Office Site Coverage and Baseline Inspection During Maximum Teleworking for COVID-19" (ADAMS Accession No. [ML20097E538](#)). This guidance highlighted that each operating reactor site should be visited by a resident inspector approximately once every three business days. Regional Administrators had the flexibility to balance local health conditions against plant risk profile to determine the appropriate onsite presence of inspectors.

The NRC also updated Inspection Manual Chapter 2515, Appendix E, "Inspection Program Modifications during Pandemics, Epidemics, or Other Widespread Illness or Diseases" (ADAMS Accession No. [ML20079E700](#)), on March 27, 2020. This manual chapter gives guidance for using a graded approach to meet the objectives of the ROP during pandemics such as the COVID-19 public health emergency.

NRR began an effort in April to research all aspects of the ROP to determine if modifications were necessary to complete the CY 2020 program execution. As a result of this effort, NRR issued guidance for completing the ROP in 2020 on May 28, 2020, via a memorandum titled "Inspection Guidance During Transition from COVID-19 Mandatory Telework" (ADAMS Accession No. [ML20141L766](#)). This memorandum confirmed that very few modifications were required, and it established the goal to complete at least the minimum inspection samples for the baseline inspection program for each site. This memorandum also gave guidelines to the Regions in transitioning the inspection effort from mandatory telework, such as beginning to

schedule and implement team and individual inspections and increasing resident inspector on-site presence and inspection activities. The memorandum also discusses that inspectors should leverage telework technology when completing administrative aspects of the ROP.

As of October 2020, the NRC has completed 82 percent of currently scheduled minimum baseline inspection samples (this does not include inspections related to security or emergency preparedness).

## **NMSS**

As a response to the COVID-19 PHE, the agency entered mandatory telework on March 19, 2020 and temporarily limited travel. NMSS issued guidance on resident inspector coverage at Category I fuel cycle facilities during this period to protect the health of inspectors and site personnel, while maintaining oversight that supports reasonable assurance of adequate protection of public health and safety (ADAMS Accession No. ML20106F226). As the agency was preparing to transition from mandatory telework, NMSS issued guidance and decision-making considerations for resuming inspection activities on June 1, 2020 (ADAMS Accession No. ML20143A281). This guidance also provided the flexibility to conduct inspections remotely, on-site, or a combination thereof; or to defer inspections, as appropriate.

While the goal is to complete the inspection program as outlined in the applicable inspection manual chapters and associated inspection procedures, the NRC is allowing ample flexibility on how the NRC staff will accomplish that goal in light of the current pandemic. Inspections have been conducted in three different formats across the country: 1) on-site, 2) remote, or 3) both on-site and remote. Cross-regional support for inspections has been used to avoid having staff travel long distances through areas with high case numbers or through areas under travel restrictions. The staff continues to coordinate with licensees to ensure the safety of both NRC staff and site personnel. When delays or deviations from the applicable inspection manual chapter are necessary due to COVID-19 considerations, the delays or deviations are tracked, and plans are put in place for completing the inspection as soon as practical. Throughout this period, there has been close coordination between the Regions and the program office in the implementation of the NMSS oversight programs.

Currently, we are closely monitoring the implementation of NMSS' oversight programs across NMSS and adjusting the scheduling of inspections, as well as how the inspections are being conducted (i.e., remote vs. on-site). We are assessing the implementation of the oversight programs during the COVID-19 PHE to inform current and future inspection guidance for oversight activities during periods of travel limitations. This effort will also inform whether any new and different ways for implementing the inspection programs should be adopted.

## **Compliance with Legislation Concerning Congressional Requests for Documents (OGC)**

The agency remains committed to cooperating with Congress in the conduct of its important oversight responsibilities.

The agency has historically responded to congressional requests for sensitive documents (including documents related to security activities, adjudications, or ongoing investigative activities) by seeking to engage in an accommodation process, including offering briefings concerning sensitive documents. Engagement in an accommodation process regarding requests for sensitive information is consistent with the practice of other agencies and Executive Branch policy, endorsed by the Department of Justice.

The *Internal Commission Procedures* (ICPs) were most recently updated in March 2016. However, Chapter VI of the ICPs (“Transmittal of Sensitive Documents to Congress”) has not been revised since July 2011. NRC appropriations legislation has, since FY 2014, mandated that the agency comply with the 2011 version of Chapter VI of the ICPs when responding to Congressional requests for information. In the FY 2019 appropriations legislation, this provision was modified slightly to state that the agency shall comply with the 2011 version of Chapter VI of the ICPs “consistent with Department of Justice guidance for all federal agencies.” This language was included again in the FY 2020 appropriations legislation.

The current (i.e., July 5, 2011) version of Chapter VI provides that the Commission’s “general” practice is to provide sensitive documents (meaning documents that have not been disclosed to the public and that may be withheld from disclosure under the Freedom of Information Act) to members of its Congressional oversight committees, and to other members of Congress when the documents address matters pertaining to that member’s state or district. Chapter VI states that in other circumstances the Commission’s preference is for requests to be made through the full committee or subcommittee chair or ranking minority member. Chapter VI also indicates that sensitive documents are normally provided only upon written request.

Chapter VI further provides that for “particularly sensitive” documents (meaning documents that relate to ongoing security activities, adjudications, pending enforcement actions, or ongoing investigations), the Commission’s “preference” is that such documents not be provided to Congress until after the agency has reached a decision on the matter. OCA is to “discuss the sensitivity of the document with the requester” and, if the request is not withdrawn or deferred, “after consultation with the Commission,” will provide these documents to Congress in accordance with transmittal procedures described in Chapter VI. Additionally, Chapter VI states that in some cases, where the nature of documents is “highly sensitive,” alternatives to the production of sensitive documents may be considered.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

<b>Item #</b>	<b>Category</b>	<b>Title</b>	<b>CPR Priority</b>	<b>RIN</b>	<b>Docket ID</b>	<b>Associated PRM Numbers</b>	<b>Abstract</b>
1	Rulemaking Actions	2021 Edition of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code	High	3150-AK21	NRC-2018-0289	N/A	This rulemaking would amend the NRC's regulations to authorize the use of recent editions of American Society of Mechanical Engineers (ASME) codes. The rule would incorporate by reference the 2021 Edition of the ASME Boiler and Pressure Vessel Code into the NRC's regulations, with conditions. This action increases consistency across the industry and makes use of current voluntary consensus standards (as required by the National Technology Transfer and Advancement Act), while continuing to provide adequate protection to the public. This rulemaking would affect nuclear power reactor licensees.
2	Rulemaking Actions	2022 Edition of the American Society of Mechanical Engineers Operations and Maintenance Code	High	3150-AK43	NRC-2020-0030	N/A	This rulemaking would amend the NRC's regulations to authorize the use of recent editions of American Society of Mechanical Engineers (ASME) codes. The rule would incorporate by reference the 2022 Edition of the ASME Operations and Maintenance of Nuclear Power Plants Code into the NRC's regulations, with conditions. This action increases consistency across the industry and makes use of current voluntary consensus standards (as required by the National Technology Transfer and Advancement Act), while continuing to provide adequate protection to the public. This rulemaking would affect nuclear power reactor licensees.
3	Rulemaking Actions	2023 Edition of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code	High	3150-AK42	NRC-2020-0029	N/A	This rulemaking would amend the NRC's regulations to authorize the use of recent editions of American Society of Mechanical Engineers (ASME) codes. The rule would incorporate by reference the 2023 Edition of the ASME Boiler and Pressure Vessel Code into the NRC's regulations, with conditions. This action increases consistency across the industry and makes use of current voluntary consensus standards (as required by the National Technology Transfer and Advancement Act), while continuing to provide adequate protection to the public. This rulemaking would affect nuclear power reactor licensees.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

4	Rulemaking Actions	Advanced Boiling-Water Reactor (ABWR) Design Certification Renewal	High	3150-AK04	NRC-2017-0090	N/A	This rulemaking would amend the NRC's regulations to extend the term of applicability of the Advanced Boiling-Water Reactor (ABWR) standard plant design, which is certified in an appendix. This action would allow applicants intending to construct and operate a nuclear power plant to continue to reference this design certification rule in future applications for a further 15 years.
5	Rulemaking Actions	American Society of Mechanical Engineers 2019 - 2020 Code Editions	High	3150-AK22	NRC-2018-0290	N/A	This rulemaking would amend the NRC's regulations to authorize the use of recent editions of American Society of Mechanical Engineers (ASME) codes. The rule would incorporate by reference the 2019 ASME Boiler Pressure Vessel Code and the 2020 Edition of the ASME Operations and Maintenance of Nuclear Power Plants Code into the NRC's regulations, with conditions. This action increases consistency across the industry and makes use of current voluntary consensus standards (as required by the National Technology Transfer and Advancement Act), while continuing to provide adequate protection to the public. This rulemaking would affect nuclear power reactor licensees.
6	Rulemaking Actions	Approval of American Society of Mechanical Engineers Code Cases, Revision 39	High	3150-AJ94	NRC-2017-0025	N/A	This rulemaking would incorporate by reference into the NRC's regulations the latest revision to Regulatory Guides that list the American Society of Mechanical Engineers (ASME) Code Cases that the NRC finds to be acceptable (or conditionally acceptable). This action increases consistency across the industry and makes use of current voluntary consensus standards (as required by the National Technology Transfer and Advancement Act), while continuing to provide adequate protection to the public. This rulemaking would affect nuclear power reactor licensees. This rulemaking was formerly titled, "Regulatory Guide (RG) 1.84, Rev. 39; and RG 1.147, Rev. 20; and RG 1.192, Rev. 4; Approval of American Society of Mechanical Engineers Code Cases."

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

7	Rulemaking Actions	Approval of American Society of Mechanical Engineers Code Cases, Revision 40	High	3150-AK23	NRC-2018-0291	N/A	This rulemaking would incorporate by reference into the NRC's regulations the latest revision to Regulatory Guides that list the American Society of Mechanical Engineers (ASME) Code Cases that the NRC finds to be acceptable (or conditionally acceptable). This action increases consistency across the industry and makes use of current voluntary consensus standards (as required by the National Technology Transfer and Advancement Act), while continuing to provide adequate protection to the public. This rulemaking would affect nuclear power reactor licensees.
8	Rulemaking Actions	Cyber Security for Fuel Facilities	High	3150-AJ64	NRC-2015-0179	N/A	This rulemaking would amend the NRC's regulations to add cyber security requirements for certain nuclear fuel cycle facility applicants and licensees. The rule would require certain fuel cycle facilities to establish, implement, and maintain a cyber security program that is designed to protect public health and safety and the common defense and security. It would affect fuel cycle applicants or licensees that are or plan to be authorized to: (1) possess greater than a critical mass of special nuclear material and perform activities for which the NRC requires an integrated safety analysis or (2) engage in uranium hexafluoride conversion or deconversion.
9	Rulemaking Actions	Drug and Alcohol Testing: Technical Issues and Editorial Changes	High	3150-AJ15	NRC-2012-0079	PRM-26-4, PRM-26-7, PRM-26-8	This rulemaking would amend the NRC's regulations to revise the drug and alcohol testing requirements for fitness-for-duty programs. The purpose of the rule is to strengthen the fitness-for-duty regulatory framework to include advancements in testing technology, such as changes to the specimens that can be tested for drugs. This rulemaking would provide a program that is more proactive in its approach to ensure that persons who have unescorted access to NRC-licensed facilities are fit for duty. The rulemaking addresses three petitions for rulemaking (PRM-26-4, PRM-26-7, PRM-26-8).

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

10	Rulemaking Actions	Enhanced Security for Special Nuclear Material	High	3150-AJ41	NRC-2014-0118	N/A	This rulemaking would amend the NRC's regulations to make generically applicable security requirements imposed in security orders after the events of September 11, 2001. The scope of this rulemaking would affect the physical protection of nuclear plants, fuel cycle facilities, and spent nuclear material.
11	Rulemaking Actions	Enhanced Weapons for Spent Fuel Storage Installations and Transportation— Section 161A Authority	High	3150-AJ55	NRC-2015-0018	N/A	This rulemaking would amend the NRC's regulations to implement the authority in Section 161A of the Atomic Energy Act of 1954, as amended, related to access to enhanced weapons and associated firearms background checks. The rule would designate additional classes of facilities and activities appropriate for Section 161A authority.
12	Rulemaking Actions	Enhanced Weapons, Firearms Background Checks, and Security Event Notifications	High	3150-AI49	NRC-2011-0018	N/A	This rulemaking would amend the NRC's regulations to implement the authority in Section 161A of the Atomic Energy Act of 1954, as amended, related to access to enhanced weapons and associated firearms background checks. The rule would also modify physical security event notifications. Additionally, the rule would add requirements for reporting suspicious activities to law enforcement agencies and the NRC. This rulemaking would affect multiple categories of reactor and material facility licensees.
13	Rulemaking Actions	Fitness-for-Duty Drug Testing Program Requirements	High	3150-AI67	NRC-2009-0225	N/A	This rulemaking would amend the NRC's regulations to revise the drug testing requirements for fitness-for-duty programs. The purpose is to align the NRC's drug testing requirements more closely with changes in the 2008 U.S. Department of Health and Human Services' "Mandatory Guidelines for Federal Workplace Drug Testing Programs." The rulemaking would amend the NRC's regulations for the drugs tested and the protections provided to individuals subject to the program at NRC-licensed facilities.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

14	Rulemaking Actions	Generic Environmental Impact for License Renewal	High	3150-AK32	NRC-2018-0296	N/A	This rulemaking would amend the NRC's environmental protection regulations by updating the 2013 findings on the environmental effect of renewing the operating license of a nuclear power plant. This rulemaking could redefine the number and scope of the environmental impact issues that must be addressed by the NRC in its environmental reviews during license renewal. This rulemaking would affect operating power reactor licensees that seek an initial or subsequent renewed operating license.
15	Rulemaking Actions	Greater-Than-Class-C and Transuranic Waste	High	3150-AK00	NRC-2017-0081	N/A	This rulemaking would amend the NRC's regulations to address Greater-Than-Class-C and transuranic waste disposal requirements. The rule would improve the effectiveness of the waste regulatory framework by clearly defining the requirements for the near surface land disposal of Greater-Than-Class-C and transuranic waste. This rulemaking would affect the licensees of and applicants for nuclear power reactors, nuclear fuel cycle facilities, and other facilities that produce Greater-Than-Class-C and transuranic waste.
16	Rulemaking Actions	Independent Spent Fuel Storage Installation Security Requirements	High	3150-AI78	NRC-2009-0558	PRM-72-6	This rulemaking would amend the NRC's regulations to make generically applicable security requirements imposed in security orders issued after the events of September 11, 2001. The scope of this rulemaking would affect the physical protection of independent spent fuel storage installations.
17	Rulemaking Actions	Integrated Radioactive Source Security and Accountability	High	N/A	NRC-2015-0094	PRM-37-1	This rulemaking would improve the effectiveness of the regulatory framework by addressing issues from operating experience identified by several internal and external groups, including the NRC's program review of the Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material and it also will consider changes proposed in a petition for rulemaking from the Nuclear Energy Institute, PRM-37-1, related to the storage of large components at reactor sites. The proposed updates to existing regulations will increase the regulatory effectiveness of all phases of control of radioactive materials, including licensing, specific security measures, and end of lifecycle management. This rulemaking retitles and reprioritizes the "Part 37 Rulemaking" (NRC-2017-0023) which will no longer be tracked separately.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

18	Rulemaking Actions	List of Approved Spent Fuel Storage Casks [This is a placeholder for several annually recurring rules.]	High	N/A	N/A	N/A	These rules would approve the use of new and amended cask designs for dry storage of spent fuel. Casks that have been approved for use under a general license are added to the list of approved designs in 10 CFR Part 72. The Nuclear Regulatory Commission publishes a varying number of these rules each year.
19	Rulemaking Actions	List of Approved Spent Fuel Storage Casks: Holtec International HI-STORM UMAX Canister Storage System, Certificate of Compliance No. 1040, Amendment No. 4	High	3150-AK51	NRC-2020-0179	N/A	This action is to promulgate the direct final rule for amending the listing in 10 CFR 72.214 ("List of approved spent fuel storage casks") to add Amendment No. 4 to Certificate of Compliance No. 1040 for the Holtec International HI-STORM UMAX Canister Storage System.
20	Rulemaking Actions	List of Approved Spent Fuel Storage Casks: NAC International, Inc. MAGNASTOR Storage System, Certificate of Compliance No. 1031, Amendment No. 9	High	3150-AK50	NRC-2020-0166	N/A	This action is to promulgate a direct final rule to amend the listing in 10 CFR 72.214, "List of approved spent fuel storage casks" to add Amendment No. 9 to Certificate of Compliance No. 1031 for the NAC International, Inc. MAGNASTOR Storage System.
21	Rulemaking Actions	Low-Level Radioactive Waste Disposal	High	3150-AI92	NRC-2011-0012	N/A	This rulemaking would amend the NRC's regulations to revise the licensing requirements for low-level radioactive waste disposal. The rule would ensure that the waste streams that are significantly different from those considered during the development of existing regulations will continue to be disposed of safely and meet the performance objectives for land disposal of low-level radioactive waste. The rule would require certain licensees and applicants to conduct site-specific analyses, including a new intruder assessment, using a specified compliance period and would make other clarifying changes.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

22	Rulemaking Actions	NuScale Small Modular Reactor Design Certification	High	3150-AJ98	NRC-2017-0029	N/A	<p>This rulemaking would amend the NRC's regulations to incorporate the NuScale small modular reactor (SMR) standard plant design. The rulemaking would add a new appendix for the initial certification of the NuScale SMR standard plant design. This action would allow applicants intending to construct and operate an SMR reactor nuclear power plant to reference this design certification rule in future applications.</p>
23	Rulemaking Actions	Performance-Based Emergency Core Cooling System Acceptance Criteria	High	3150-AH42	NRC-2008-0332	PRM-50-71, PRM-50-84	<p>This rulemaking would amend the NRC's regulations to update the fuel cladding acceptance criteria for emergency core cooling system loss-of-coolant accident (LOCA) evaluations. The rule would establish new emergency core cooling system acceptance criteria that are performance-based and reflect research findings that identified new embrittlement mechanisms for fuel rods with zirconium alloy cladding under LOCA conditions. The scope of this rulemaking would affect nuclear power reactor licensees. The rulemaking addresses two petitions for rulemaking (PRM-50-71 and PRM-50-84).</p>
24	Rulemaking Actions	Reactor Vessel Material Surveillance Testing During Period of Extended Operation	High	N/A	NRC-2018-0295	N/A	<p>This rulemaking would revise the NRC's requirements for reactor vessel material surveillance programs for those power reactors that would operate during a license renewal period. The purpose of this rule is to address the need to periodically monitor the fracture toughness of the reactor pressure vessel during periods of extended operation and it would also potentially obviate the need for license amendment requests. This rulemaking would affect all commercial light-water reactor units that would operate during a period of extended operation.</p>

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

25	Rulemaking Actions	Regulatory Improvements for Production and Utilization Facilities Transitioning to Decommissioning	High	3150-AJ59	NRC-2015-0070	N/A	This rulemaking would amend the NRC's regulations to provide an appropriate regulatory framework for nuclear power reactors transitioning from operations to decommissioning. The goals of this rulemaking are to provide for a safe, effective, and efficient decommissioning process; to reduce the need for license amendment requests and exemptions from existing regulations; and to address other decommissioning issues deemed relevant by the NRC. The rulemaking would address lessons learned from licensees that have completed or are currently in the decommissioning process. The rulemaking also would align regulatory requirements with the reduction in risk that occurs over time, while continuing to maintain safety and security. The scope of this rulemaking would affect production and utilization facilities.
26	Rulemaking Actions	Revise Enrichment Limits to Support Licensing New Fuel Designs	High	N/A	NRC-2020-0034	N/A	This rulemaking would amend the NRC's regulations to revise the current uranium-235 enrichment limit. The purpose of this is to support the licensing of fuel designs that make use of enrichments greater than the current limit (e.g., accident tolerant fuel). Specifically, the rulemaking would seek to increase the enrichment limit from the current value of 5 weight% (wt%) to a higher value (e.g., 8 wt%) or a performance-based approach.
27	Rulemaking Actions	Revision of Fee Schedules: Fee Recovery for FY 2021	High	3150-AK24	NRC-2018-0292	N/A	This rulemaking would amend the NRC's regulations for fee schedules. The NRC conducts this rulemaking annually to recover approximately 100 percent of the NRC's annual budget authority, less excluded activities to implement NEIMA. This rulemaking would affect the fee schedules for licensing, inspection, and annual fees charged to the NRC's applicants and licensees.
28	Rulemaking Actions	Revision of Fee Schedules: Fee Recovery for FY 2022	High	3150-AK44	NRC-2020-0031	N/A	This rulemaking would amend the NRC's regulations for fee schedules. The NRC conducts this rulemaking annually to recover approximately 100 percent of the NRC's annual budget authority, less excluded activities to implement NEIMA. This rulemaking would affect the fee schedules for licensing, inspection, and annual fees charged to the NRC's applicants and licensees.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

29	Rulemaking Actions	Risk-Informed, Technology Inclusive Regulatory Framework for Advanced Reactors	High	3150-AK31	NRC-2019-0062	N/A	This rulemaking would establish an optional technology-inclusive regulatory framework for use by applicants for new commercial advanced nuclear reactors. The regulatory requirements developed in this rulemaking would use methods of evaluation, including risk-informed and performance-based methods, that are flexible and practicable for application to a variety of advanced reactor technologies.
30	Rulemaking Actions	U.S. Advanced Pressurized Water Reactor (US-APWR) Design Certification	High	3150-AI83	NRC-2010-0133	N/A	This rulemaking would amend the NRC's regulations to incorporate the U.S. Advanced Pressurized-Water Reactor (US-APWR) standard plant design. The rulemaking would add a new appendix for the initial certification of the US-APWR standard plant design. This action would allow applicants intending to construct and operate a nuclear power plant to reference this design certification rule in future applications.
31	Rulemaking Actions	Updates for Emerging Medical Technologies	High	N/A	NRC-2018-0297	N/A	This rulemaking would revise the NRC's regulations to update the requirements to allow for the inclusion of emerging medical technologies. The purpose of the rulemaking is primarily to bring established modalities currently licensed as emerging medical technologies and allow them to be licensed under other subsections of the regulations to improve licensing consistency across the country. The regulated entities affected would include all NRC, Agreement State, and Master Materials License medical licensees and permittees using microspheres and gamma stereotactic radiosurgery.
32	Rulemaking Actions	Adjustment of Civil Penalties for Inflation for Fiscal Year 2021	Medium	3150-AK25	NRC-2018-0293	N/A	The rulemaking would amend the NRC's regulations to revise the amount of the maximum civil monetary penalties the NRC can assess. These adjustments are mandated by Congress through the Federal Civil Penalties Inflation Adjustment Act of 1990, as amended by the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015. Specifically, this action would adjust the maximum civil monetary penalty the NRC can assess for violation of the Atomic Energy Act of 1954, as amended, as well as the maximum civil monetary penalty the NRC can assess for false claims or statements under the Program Fraud Civil Remedies Act.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

33	Rulemaking Actions	Adjustment of Civil Penalties for Inflation for Fiscal Year 2022	Medium	3150-AK45	NRC-2020-0032	N/A	The rulemaking would amend the NRC's regulations to revise the amount of the maximum civil monetary penalties the NRC can assess. These adjustments are mandated by Congress through the Federal Civil Penalties Inflation Adjustment Act of 1990, as amended by the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015. Specifically, this action would adjust the maximum civil monetary penalty the NRC can assess for violation of the Atomic Energy Act of 1954, as amended, as well as the maximum civil monetary penalty the NRC can assess for false claims or statements under the Program Fraud Civil Remedies Act.
34	Rulemaking Actions	Alignment of Licensing Processes and Lessons Learned from New Reactor Licensing	Medium	3150-AI66	NRC-2009-0196	N/A	This rulemaking would amend the NRC's regulations for the licensing of new reactors. The rule would align requirements between the two licensing processes provided in the NRC's regulations to ensure that all new reactor applications conform to the NRC's policies and requirements, regardless of the selected licensing approach. The rule would address lessons learned from NRC reviews conducted for combined licenses, design certifications, early site permits, and operating licenses.
35	Rulemaking Actions	Alternative Physical Security Requirements for Advanced Reactors	Medium	3150-AK19	NRC-2017-0227	N/A	This rule would amend the NRC's physical security requirements for small modular reactors and other advanced reactor technologies. This rulemaking would establish voluntary alternative physical security requirements commensurate with the potential consequences to public health and safety and the common defense and security. This rulemaking would provide regulatory stability, predictability, and clarity in the licensing process and minimize or eliminate uncertainty for applicants who might otherwise request exemptions from the regulations.
36	Rulemaking Actions	Amendment to Access Authorization Fees	Medium	3150-AK49	NRC-2020-0133	N/A	This rulemaking would amend the NRC's regulations to revise the access authorization fees charged to licensees for work performed under the Material Access Authorization Program (MAAP) and the Information Access Authority Program (IAAP). The Chief Financial Officers Act of 1990 requires a biennial review of fees and other charges imposed and is the impetus for this amendment.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

37	Rulemaking Actions	Categorical Exclusions from Environmental Review	Medium	N/A	NRC-2018-0300	N/A	This rulemaking would amend the NRC's regulations describing the categories of actions which do not require an environmental review under the requirements of the National Environmental Policy Act of 1969 (NEPA) because they have no significant impact on the human environment. The purpose of this rule would be to eliminate the unnecessary preparation of environmental assessments (EAs), when no significant environmental impacts are expected. This rule would directly impact the NRC and indirectly impact its licensees.
38	Rulemaking Actions	Controlled Unclassified Information	Medium	3150-AK30	NRC-2019-0060	N/A	This rulemaking would amend the NRC's regulations to comply with the requirements of Executive Order 13556 and 32 CFR part 2002 for the protection of Controlled Unclassified Information. The rule would update the regulations to ensure an adequate transition from the agency's use of the Sensitive Unclassified Non-Safeguards Information program to the Controlled Unclassified Information program. This rule would impact how the NRC and its licensees classify and protect unclassified information.
39	Rulemaking Actions	Decommissioning Financial Assurance for Germanium-68/Gallium-68 Generators Returned to Manufacturers or Distributors	Medium	N/A	NRC-2017-0031	N/A	This rulemaking would remove the unnecessary cost of a decommissioning financial assurance plan (DFP) for licensees and applicants possessing fewer than 20 generators if the used generators are returned directly to their manufacturer and distributor. This rulemaking would add a footnote to Appendix B to Part 30 "Quantities of Licensed Material Requiring Labeling," that would effectively raise from 10 mCi to 1 Ci the threshold at which a DFP is required for germanium-68/gallium-68 generators. This increased DFP threshold would only apply to users that have an agreement in place to ensure that the user will return and that the manufacturer and distributor will accept the generator after use.
40	Rulemaking Actions	Definition of Utilization Facility for Medical Radioisotope Facilities	Medium	N/A	NRC-2018-0299	N/A	This rulemaking would amend the definition of "utilization facility," in section 50.2 of the NRC's regulations. The purpose of this limited applicability rulemaking would be to include the accelerator-driven subcritical operating assemblies proposed by Niowave, Inc. This rule would only impact Niowave, Inc.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

41	Rulemaking Actions	Emergency Preparedness Requirements for Small Modular Reactors and Other New Technologies	Medium	3150-AJ68	NRC-2015-0225	N/A	This rulemaking would amend the NRC's regulations to add new emergency preparedness requirements for small modular reactors and other new technologies such as non-light-water reactors and non-power production or utilization facilities. The rule would adopt a scalable plume exposure pathway emergency planning zone approach that is performance-based, consequence-oriented, and technology-inclusive. This rulemaking would affect applicants for new NRC licenses and reduce regulatory burden related to the exemption process.
42	Rulemaking Actions	Financial Qualifications Requirements for Reactor Licensing	Medium	3150-AJ43	NRC-2014-0161	N/A	This rulemaking would amend the NRC's regulations to revise financial qualification demonstration requirements for initial license issuance of nuclear power reactors. The rule would resolve the potential impediment to licensing that industry has identified for some non-electric utility (merchant plant) applicants. The scope of this rulemaking would affect applicants for new NRC licenses.
43	Rulemaking Actions	Geologic Repository Operations Area (GROA) Fitness-For-Duty Requirements	Medium	3150-AI38	NRC-2009-0089	N/A	This rulemaking would amend the NRC's regulations regarding the fitness-for-duty requirements for personnel in a geologic repository operations area. The rule would impose fatigue provisions on security personnel and reinstate the alcohol and drug provisions of the fitness-for-duty requirements at a geologic repository operations area. The scope of the rulemaking would affect fitness-for-duty programs at geological repository operations areas.
44	Rulemaking Actions	Geologic Repository Operations Area Security and Material Control and Accounting Requirements	Medium	3150-AI06	NRC-2007-0670	N/A	This rulemaking would amend the NRC's regulations regarding security and material control and accounting requirements for a geologic repository operations area. The rule would establish security and material control and accounting requirements for a geologic repository operations area that were identified to be necessary after the events of September 11, 2001. The scope of the rulemaking would affect security and material control and accounting programs at geological repository operations areas.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

45	Rulemaking Actions	Groundwater Protection In Situ Leach Uranium Recovery Facilities	Medium	3150-AI40	NRC-2008-0421	N/A	This rulemaking would amend the NRC's regulations to ensure groundwater protection at in situ leach uranium recovery facilities. The rule would create a more efficient licensing process by codifying requirements currently imposed through license conditions. The rule would affect in situ leach uranium recovery facility licensees and applicants.
46	Rulemaking Actions	Harmonization of Transportation Safety Requirements with IAEA Standards	Medium	3150-AJ85	NRC-2016-0179	N/A	This rulemaking would amend the NRC's regulations regarding the packaging and transportation of radioactive material to make them compatible with those of the International Atomic Energy Agency. The rule would harmonize domestic regulations for Type B and fissile radioactive material transportation packaging with the 2012 and 2018 Editions of the IAEA Safety Standards Regulations for the Safe Transport of Radioactive Material. This rulemaking would address knowledge gained in scientific and technical advances and affect the package design requirements and transportation of radioactive material.
47	Rulemaking Actions	Industrial Radiographic Operations and Training	Medium	N/A	NRC-2017-0022	PRM-34-6	This rule would address a petition that requested the Nuclear Regulatory Commission amend its regulations to require that an individual receive at least 40 hours of radiation safety training before using sources of radiation for industrial radiography, to revise the requirements for at least two qualified individuals to be present at a temporary job site, and to clarify how many individuals are required to meet surveillance requirements. The petition also requested that NUREG-1556, Volume 2, be revised to reflect the proposed amendments.
48	Rulemaking Actions	Items Containing Byproduct Material Incidental to Production	Medium	3150-AJ54	NRC-2015-0017	PRM-30-65	This rulemaking would amend the NRC's regulations regarding requirements for track-etched membranes that have been irradiated with mixed fission products during the production process. The rule also would accommodate the licensing and distribution of other irradiated products (e.g., gemstones) without the need for a specific exemption for each distributor. This rulemaking would affect the licensees and applicants for items containing byproduct material incidental to production. The rulemaking addresses a petition for rulemaking (PRM-30-65).

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

49	Rulemaking Actions	Miscellaneous Administrative Rulemaking [This is a placeholder for one or more rules making administrative or corrective changes to the CFR]	Medium	N/A	N/A	N/A	This is a placeholder for corporate support rulemakings that make administrative updates to the Nuclear Regulatory Commission's regulations in the Code of Federal Regulations that may be published throughout the year.
50	Rulemaking Actions	Modification of Administrative Requirements	Medium	N/A	NRC-2018-0298	N/A	This rulemaking is a placeholder for potential rulemakings related to the Retrospective Review of Administrative Requirements (RROAR) Initiative which will be making recommendations to the Commission about potential changes to administrative requirements. The purpose of the initiative is to identify changes to administrative requirements to enhance the efficiency of NRC regulations, eliminate potentially duplicative requirements, and to reduce burden on regulated entities, the NRC, or both.
51	Rulemaking Actions	Non-power Production or Utilization Facility License Renewal	Medium	3150-AI96	NRC-2011-0087	N/A	This rulemaking would amend the NRC's regulations to update and clarify the license renewal process for non-power production or utilization facilities (NPUFs). The rule would eliminate license renewal for NPUFs used for research or medical therapy, and would define the license renewal process for commercial and industrial NPUFs. This rulemaking would reduce the resources needed for longer-term licensing of NPUFs.
52	Rulemaking Actions	Reactor Vessel Material Surveillance Program Requirements (Appendix H)	Medium	3150-AK07	NRC-2017-0151	N/A	This rulemaking would amend the NRC's regulations to revise the requirements for reactor vessel material surveillance programs. The purpose is to reduce regulatory burden by eliminating the testing of specimens that do not provide meaningful information and increasing the period for reporting test results to the NRC. This rulemaking would affect all commercial light-water reactor operating units and units under construction.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

53	Rulemaking Actions	Receipts-Based Small Business Size Standards	Medium	3150-AJ51	NRC-2014-0264	N/A	This rulemaking would amend the NRC's regulations to revise the agency's small business size standards. Previously, the NRC developed a small business size standard that is specific to the nuclear industry and does not depend on the Small Business Administration's size standard. This rulemaking would amend the size standards that the NRC uses to qualify an NRC licensee as a "small entity" under the Regulatory Flexibility Act of 1980, as amended to align with the Small Business Administration's size standard.
54	Rulemaking Actions	Reporting Requirements for Non-Emergency Events at Nuclear Power Plants	Medium	N/A	NRC-2020-0036	PRM-50-116	This rulemaking would amend the NRC's regulations to revise the nonemergency reporting requirements for power reactors and new reactors. The rule would assess the reporting requirements and guidance with the goal to reduce unnecessary reporting burden. PRM-50-116 would be partially addressed in this rule.
55	Rulemaking Actions	Revision to the NRC's Acquisition Regulation (NRCAR)	Medium	3150-AJ36	NRC-2014-0033	N/A	This rulemaking would amend the NRC's acquisition regulation that governs the procurement of goods and services for the agency. The purpose of this rulemaking is to update the NRCAR to conform with external regulations, incorporate NRC organizational changes, and remove outdated or obsolete information. The revisions would affect both internal and external stakeholders (contractors) and are needed to support current NRC contracting policies and ensure openness, transparency, and effectiveness in agency acquisitions.
56	Rulemaking Actions	Spent Fuel Cask Certificate of Compliance Format and Content	Medium	N/A	NRC-2014-0067	PRM-72-7	This rule would address a petition for rulemaking that requests the Nuclear Regulatory Commission add a new rule that governs the format and content of spent fuel storage cask Certificates of Compliance, extend the backfit rule to Certificates of Compliance, and make other improvements that result in "more efficient and effective NRC oversight of dry cask storage activities as well as improved implementation of dry cask storage requirements by industry."

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

57	Rulemaking Actions	Spent Fuel Reprocessing	Medium	3150-AJ53	NRC-2015-0016	N/A	This rulemaking would amend the NRC's regulations to add a new part to the existing regulatory framework that would be specific to nuclear fuel reprocessing facilities. These requirements would provide an effective, transparent, and efficient approach to licensing and regulating a reprocessing facility. The scope of this rulemaking would affect the licensees and applicants of nuclear reprocessing facilities.
58	Rulemaking Actions	Training and Experience Requirements for Unsealed Byproduct Materials	Medium	N/A	NRC-2020-0035	N/A	This proposed rulemaking would amend the NRC's regulations in 10 CFR Part 35 regarding training and experience (T&E) requirements for authorized users (AUs). The purpose of the rulemaking is to increase the efficiency, effectiveness, and clarity of the T&E requirements. The rulemaking would require that all new AUs be certified by an NRC-recognized medical specialty board, and the NRC's board recognition criteria would be broadened and aligned with advancements in emerging medical technologies.
59	Rulemaking Actions	Updates and Clarifications on the Export of Nuclear Material	Medium	3150-AK26	NRC-2018-0294	N/A	This rulemaking would amend the NRC's regulations to revise the requirements for the export of nuclear material, specifically special nuclear material and source material to the United Kingdom. This rule would add the United Kingdom to the requirements for Commission and Executive Branch level reviews or export license applications as a result of the United Kingdom's decision to leave EURATOM. This is a foreign policy action of the United States and meets the good cause exception under the Administrative Procedures Act.
60	Rulemaking Actions	Updates on the Export of Deuterium	Medium	3150-AJ45	NRC-2014-0201	N/A	This rulemaking would amend the NRC's regulations to revise the requirements for the export of nuclear material, specifically deuterium and deuterated products. The rule would provide updates and clarifications to export regulations based on recent industrial experience and technological changes. This rulemaking would update the export licensing provisions to reflect technological changes involving non-nuclear industrial and research uses of deuterium and deuterated compounds.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

61	Rulemaking Actions	Alternatives to the Use of Credit Ratings	Low	3150-AJ92	NRC-2017-0021	N/A	This rulemaking would amend the NRC's regulations to remove any use or reference to bond rating, as mandated by the Dodd-Frank Act of 2010. The rule would develop alternate criteria, if any, to replace bond rating criteria. The purpose is to ensure financial tests are sufficient when evaluating decommissioning financial assurance. The scope of this rulemaking would affect all NRC's regulations referring to bond rating. The rulemaking was formerly titled "Dodd-Frank Act of 2010."
62	Rulemaking Actions	Cost Recovery Criteria for Research and Development Utilization Facilities	Low	N/A	NRC-2020-0071	N/A	This rulemaking would amend the NRC's regulations to clarify the NRC's application of the financial criteria to certain licensees in order to address recent changes made to Section 104c of the AEA by NEIMA. The NRC will use the rulemaking process to clarify the applicability of the new cost recovery criteria. This rulemaking would enhance regulatory certainty for holders of class 104c utilization facility licenses issued under the current requirements.
63	Rulemaking Actions	Non-Substantive Amendments to Adjudicatory Proceeding Requirements	Low	3150-AK46	NRC-2020-0033	N/A	This omnibus rulemaking would amend the NRC's regulations to revise and clarify various rules of the agency's proceeding requirements. This rule would revise and clarify proceeding requirements to reflect current Atomic Safety and Licensing Board practice, Commission case law, decisions from the Supreme Court of the United States, Executive Orders from the President of the United States, and continuity within Chapter I of Title 10 of the Code of Federal Regulations.
64	Petition Actions	Access to the Decommissioning Trust Fund for the Disposal of Large Components	N/A	N/A	NRC-2019-0083	PRM-50-119	On February 22, 2019, Gerard Van Noordennen, on behalf of EnergySolutions submitted a petition requesting that the NRC revise the criteria for decommissioning and allow access to the decommissioning trust fund for removal of major radioactive components as part of the decommissioning process.
65	Petition Actions	Accident Source Term Methodologies and Corresponding Release Fractions	N/A	N/A	NRC-2020-0150	PRM-50-122	On May 31, 2020, Brian D. Magnuson submitted a petition requesting that the NRC revise 10 CFR 50.67 to codify accident source term methodologies and the corresponding release fractions.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

66	Petition Actions	Alternative Method for Calculating Embrittlement for Steel Reactor Vessels	N/A	N/A	NRC-2019-0180	PRM-50-120	On August 19, 2019, Thomas A. Bergman on behalf of NuScale Power, LLC, submitted a petition requesting that the NRC revise its regulations to alleviate a requirement for calculating the embrittlement for advanced reactor designs and that it add the formula for calculating the mean value of the transition temperature shift for the embrittlement trend curve (ETC) described in American Society for Testing and Materials (ASTM) E900-152 to its regulations and guidance documents.
67	Petition Actions	Calculated Maximum Fuel Element Cladding Temperature	N/A	N/A	NRC-2009-0554	PRM-50-93	On November 17, 2009, and June 7, 2010, Mark Edward Leyse, on behalf of the New England Coalition, submitted a petition requesting that the NRC revise the regulations to require that the calculated maximum fuel element cladding temperature not exceed a limit based on data from multi rod (assembly) severe fuel damage experiments.
68	Petition Actions	Calculated Maximum Fuel Element Cladding Temperature	N/A	N/A	NRC-2009-0554	PRM-50-95	On November 17, 2009, and June 7, 2010, Mark Edward Leyse, on behalf of the New England Coalition, submitted a petition requesting that the NRC revise the regulations to require that the calculated maximum fuel element cladding temperature not exceed a limit based on data from multi rod (assembly) severe fuel damage experiments.
69	Petition Actions	Criteria to Return Retired Nuclear Power Reactors to Operations	N/A	N/A	NRC-2019-0063	PRM-50-117	On December 26, 2018, George Berka submitted a petition requesting that the NRC revise the criteria to return retired nuclear power reactors to operations.
70	Petition Actions	Determining Which Structures, Systems, and Components and Functions Are Important to Safety	N/A	N/A	NRC-2015-0213	PRM-50-112	On July 20, 2015, and supplemented on August 31, 2015, Kurt T. Schaefer submitted a petition requesting that the NRC amend its regulations by defining and providing a set of criteria for determining which structures, systems, components and functions are 'important to safety.
71	Petition Actions	Elimination of Immediate Notification Requirements for Non-Emergency Events	N/A	N/A	NRC-2018-0201	PRM-50-116	On August 2, 2018, Bill Pitesa, on behalf of the Nuclear Energy Institute submitted a petition requesting that the NRC revise its regulations to remove non-emergency notification requirements.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

72	Petition Actions	Erik Erb— Minimum Day Off Requirement for Security Officers	N/A	N/A	NRC-2010-0310	PRM-26-6	On August 17, 2010, Erik Erb submitted a petition requesting that the NRC amend its fitness-for-duty regulations to decrease the minimum days off requirement from an average of 3 days per week to 2.5 or 2 days per week for security officers working 12-hour shifts. On May 16, 2011, the NRC (76 FR 28191) closed the docket for this petition because the NRC determined that it would be considered in the rulemaking titled “Fitness-for-Duty Programs” (Docket ID: NRC-2009-0090). On December 9, 2015, the NRC discontinued the “Fitness-for-Duty Programs” rulemaking and the NRC determined that this petition would be resolved in a separate action (80 FR 76394).
73	Petition Actions	Linear No-Threshold Model and Standards for Protection against Radiation	N/A	N/A	NRC-2015-0057	PRM-20-28	On February 9, 2015, February 13, 2015, and February 24, 2015, Carol S. Marcus, Mark L. Miller, and Mohan Doss, respectively, submitted nearly identical petitions requesting that the NRC amend its regulations to take radiation hormesis into account and end the NRC’s reliance on the linear no-threshold hypothesis used to determine dose standards in its regulations.
74	Petition Actions	Linear No-Threshold Model and Standards for Protection against Radiation	N/A	N/A	NRC-2015-0057	PRM-20-29	On February 9, 2015, February 13, 2015, and February 24, 2015, Carol S. Marcus, Mark L. Miller, and Mohan Doss, respectively, submitted nearly identical petitions requesting that the NRC amend its regulations to take radiation hormesis into account and end the NRC’s reliance on the linear no-threshold hypothesis used to determine dose standards in its regulations.
75	Petition Actions	Linear No-Threshold Model and Standards for Protection against Radiation	N/A	N/A	NRC-2015-0057	PRM-20-30	On February 9, 2015, February 13, 2015, and February 24, 2015, Carol S. Marcus, Mark L. Miller, and Mohan Doss, respectively, submitted nearly identical petitions requesting that the NRC amend its regulations to take radiation hormesis into account and end the NRC’s reliance on the linear no-threshold hypothesis used to determine dose standards in its regulations.

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

76	Petition Actions	Measurement Standards Used at U.S. Nuclear Power Plants	N/A	N/A	NRC-2019-0071	PRM-50-118	On December 3, 2018, Michael Taylor submitted a petition requesting that the NRC revise the measurement standards used at U.S. nuclear power plants. The petitioner contends that U.S. nuclear power plants should use or should have metrology laboratories that are certified by accrediting organizations under the guidance of ISO/IEC 17025 or ANSI/NCSLI Z540.3, as a part of normal and required operations.
77	Petition Actions	Naturally-Occurring and Accelerator-Produced Radioactive Materials	N/A	N/A	NRC-2017-0159	PRM-30-66	On April 14, 2017, Matthew McKinley, on behalf of the Organization of Agreement States submitted a petition requesting that the NRC amend its regulations to specifically add the appropriate radionuclides and their corresponding activities to the list of “Quantities of Licensed Material Requiring Labeling.” The petition states that the list in appendix B to 10 CFR Part 30 is outdated and does not include conforming updates resulting from the 2005 amendment of the Energy Policy Act.
78	Petition Actions	Nuclear Energy Institute—Fitness-for-Duty Programs	N/A	N/A	NRC-2010-0304	PRM-26-5	On September 3, 2010, Anthony R. Pietrangelo, on behalf of NEI, submitted a petition requesting that the NRC amend its regulations regarding fitness-for-duty programs to refine existing requirements based on experience gained since the regulations were last amended in 2008. On May 16, 2011, the NRC closed (76 FR 28192) the docket for this petition because the NRC determined that it would be considered in the rulemaking titled “Fitness-for-Duty Programs” (Docket ID: NRC-2009-0090). On December 9, 2015, the NRC discontinued the “Fitness-for-Duty Programs” rulemaking and the NRC determined that this petition would be resolved in a separate action (80 FR 76394).

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

79	Petition Actions	Professional Reactor Operator Society—Fitness-for-Duty Programs	N/A	N/A	NRC-2009-0482	PRM-26-3	On October 16, 2009, Robert N. Meyer, on behalf of the Professional Reactor Operator Society, submitted a petition requesting that the NRC revise the definition and change the term “unit outage” to “site outage” in its regulations. On May 16, 2011, the NRC closed (76 FR 28192) the docket for this petition because the NRC determined it would be considered in the rulemaking titled “Fitness-for-Duty Programs” (Docket ID: NRC-2009-0090). On December 9, 2015, the NRC discontinued the “Fitness-for-Duty Programs” rulemaking and the NRC stated that this petition would be resolved in a separate action (80 FR 76394).
80	Petition Actions	Protection of Digital Computer and Communication Systems and Networks	N/A	N/A	NRC-2014-0165	PRM-73-18	On June 12, 2014, Anthony Pietrangelo, on behalf of Nuclear Energy Institute, submitted a petition requesting that the NRC revise certain cybersecurity language in its regulations to ensure that the rules are consistent with the NRC’s original intent, are less burdensome for NRC licensees, and adequately protects public health and safety and the common defense and security.
81	Petition Actions	Public Protective Actions During a General Emergency	N/A	N/A	NRC-2020-0155	PRM-50-123	On June 1, 2020, Thomas McKenna submitted a petition requesting that the NRC revise its regulations so that protective actions implemented during a General Emergency at a nuclear power plant will most likely do more good than harm when both the possible physical health effects of radiation exposure and protective actions are taken into consideration.
82	Petition Actions	Reporting Nuclear Medicine Injection Extravasations as Medical Events	N/A	N/A	NRC-2020-0141	PRM-35-22	On May 18, 2020, Ronald K. Lattanze on behalf of Lucerno Dynamics, LLC, submitted a petition requesting that the NRC revise its regulations to require reporting of nuclear medicine injection extravasations that exceed 0.5 Sievert (50 rem) dose equivalent to tissue as medical events (radiopharmaceutical misadministration).

**U.S. Nuclear Regulatory Commission  
Rulemaking Activities Planned  
(As of October 27, 2020)**

83	Petition Actions	Voluntary Adoption of Revised Design Basis Accident Dose Criteria	N/A	N/A	NRC-2020-0055	PRM-50-121	The petitioner requests that NRC develop a voluntary rule allowing licensees to adopt revised the current design basis accident for the dose acceptance criteria that will reflect modern health physics recommendations and modern plant designs, better balance the protection of the control room operator and of the public, and relieve the regulatory burden associated with meeting the current control room dose criterion.
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# **SAMPLES OF NOMINEE STATEMENTS AT CONFIRMATION HEARINGS**

STATEMENT OF ANNIE CAPUTO  
Committee on Environment and Public Works  
United States Senate  
June 7, 2017

Thank you, Chairman Barrasso, Ranking Member Carper, and Members of the Committee. I have been very thankful for the opportunity to work for Chairman Barrasso this year, continuing my service to the Members of the EPW Committee under his leadership.

I am grateful to President Trump for nominating me to serve on the Nuclear Regulatory Commission. Public service is a privilege. If the Senate confirms my nomination, I will be honored to serve.

Before I begin, I'd like to acknowledge my family. I'd like to thank AJ, my husband of 19 years, for his constant support of my public service. And our children, Owen and Abigail, who are our greatest blessings and who assured me they'd be on their best behavior today.

In preparing for today, I have spent time reflecting on what it would mean to take on the responsibility of a commissioner and how key experiences in my life have helped prepare me for such a role. What I realized is several experiences closely echo the NRC's Mission, Values, and Principles of Good Regulation.

First, my mother not only taught me right from wrong, but to distinguish between what's right and what's popular. This is a lesson that would guide me in the position to which I've been nominated. It is a lesson I believe is well articulated in the NRC's Principle of Independence that states:

*"All available facts and opinions must be sought openly from licensees and other interested members of the public. The many and possibly conflicting public interests involved must be considered. Final decisions must be based on objective, unbiased assessments of all information..."*

Second, my brief service as a volunteer firefighter and emergency medical technician for the Snowmass Wildcat Fire Department showed me the importance of dedication to public health and safety, professionalism, teamwork, and the satisfaction of serving the community. It was here that the seed of public service was planted and took root. These are values that guide me to this day and are in keeping with the NRC Values of Commitment, Respect, Cooperation, and Service.

Third, my first job after graduating with my nuclear engineering degree was with Commonwealth Edison in Chicago. Half of their nuclear plants were on the NRC's "watch list" due to safety concerns. Oliver Kingsley took on the role of president and transformed the organization's performance based on the principle that safety and operations are inextricably linked: that operations excellence depends on a dedication to

safety. If a nuclear plant isn't maintained with disciplined focus on safety, it won't run well. Safety first. That is what I learned from Oliver Kingsley and that is the mission of the Nuclear Regulatory Commission.

I have been privileged to serve in both the House and Senate for twelve years, the majority of my career. In these roles, I have been continually challenged by Members to learn as much as I can. In doing so, I have seen the impressive expertise and professionalism of the NRC staff in action. I have no doubt the staff's caliber and commitment is why the NRC is considered the gold standard for nuclear safety the world over. I have much to learn and they have much to teach me.

Lastly, Members have directed me to seek out the best policy, and to work with bipartisanship to accomplish their goals. These experiences developed my ability to work collegially to find agreement among different views and to craft solutions by working together.

By sharing these experiences with you, I hope to provide you with insight into my character and how my values would guide my conduct as a commissioner, if confirmed. It is humbling to be considered for such a serious responsibility. I would strive to execute that responsibility with integrity and professionalism, in a manner that earns the public's trust, and in keeping with NRC's Mission, Principles, and Values.

I appreciate the opportunity to appear today and look forward to your questions.

**WRITTEN TESTIMONY  
OF DAVID A. WRIGHT, COMMISSIONER  
UNITED STATES NUCLEAR REGULATORY COMMISSION  
TO THE  
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS**

**MARCH 11, 2020**

Thank you Chairman Barrasso, Ranking Member Carper, and esteemed members of the Committee. I appreciate the kind introduction and am very grateful to have the support of all seven members of my State's delegation. I would also like to say thank you to my family, who could not be here today. My mother, brothers and sisters, and three of my children live in South Carolina, and my oldest son and his wife live in Arkansas. Thank you for supporting me over the past two years because, as we all know, as I serve, you are serving as well. I want you to know that I love you all. For the record, mom really wanted to be here today. She was seated right behind me as I went through this process almost three years ago. Out of an abundance of caution, she decided that this is not the best time for her to be traveling. I am grateful to President Trump for nominating me to a five-year term on the Commission. If confirmed, I look forward to continuing my work on the Commission.

I also look forward to continuing to engage with this Committee. I am grateful for your commitment to your work and believe that your oversight of the NRC adds immeasurable value. As you know, the NRC has an important public health and safety mission. Every day that I have been at the NRC has given me a greater appreciation of that mission and the dedicated staff that ensure we meet this mission. It is an honor to serve our country as an NRC Commissioner, and I hope to continue to have that opportunity after June 30th.

It is a pleasure to serve with my colleagues on the Commission - Chairman Svinicki, Commissioner Baran, and Commissioner Caputo. As I said at last week's oversight hearing, I've learned so much from each of them and I appreciate their collegiality and insights on the matters before the Commission. If confirmed, I pledge to continue to work collegially with my colleagues, including Mr. Hanson, if he is confirmed.

As you know, the Commission has been involved in a number of important issues related to nuclear safety and security over the last two years. When considering these issues, safety is always my first thought and priority. I also strive to adhere to the NRC's Principles of Good Regulation, especially the principles of Independence, Efficiency, and Reliability.

To better understand the issues before me, I have visited the many types of facilities subject to NRC regulation and talked with the licensees and NRC staff at those facilities to understand the boots on the ground perspectives, challenges, and issues. Closer to home, I have made a practice of going cubicle by cubicle on every floor at NRC Headquarters and visiting NRC staff in each of the regional offices to learn about the people of the NRC and what is important to them. These interactions are extremely valuable to me, as the people of the NRC are its

greatest asset. Consistent with my open-door policy, I have met with people of all backgrounds and opinion. I have found that doing so enriches my perspective as a regulator.

As this Committee knows, these are times of change at the NRC and in the industry we regulate. While we are preparing for a future that is not completely clear, we are taking concrete steps now to ensure that we are flexible enough to meet whatever challenge is ahead. We are preparing for novel technologies while continuing to license existing technologies effectively and reliably. We are working to become a more modern, risk-informed regulator, consistent with direction in the Nuclear Energy Innovation and Modernization Act and our own Principles of Good Regulation. As the NRC prepares for the future, one thing remains constant: our laser focus on our important safety mission, which is to provide reasonable assurance of adequate protection of the public health and safety.

Chairman Barrasso, Ranking Member Carper, and members of the Committee, I appreciate the opportunity to appear today, and I look forward to your questions.

**Statement of Christopher T. Hanson**  
**Committee on Environment and Public Works**  
**March 11, 2020**

Chairman Barrasso, Ranking Member Carper, and Members of the Committee, thank you for the opportunity to appear before you today. I'm honored to have been nominated by the President to serve our country on the Nuclear Regulatory Commission.

Thank you, Senator Feinstein for your kind words of introduction. And a thank you to Senator Alexander for his letter of support.

I'd like to thank Anne, my wife and partner of 25 years for her steadfast love and support. Also here are our sons, Sam, Andrew, and Theo. Your mom and I are enormously proud of you. Finally, a thank you to my parents, Tom and Linda, who are watching over the internet back in Michigan. Hi, mom.

I grew up in Southwest Michigan just a few miles from the Palisades Nuclear Generating Station. As the test of the plant's emergency alert system blared from telephone poles each month, I understood early on the value of a reliable, independent regulator to ensure that the communities surrounding the nation's nuclear plants are safe.

My professional career has spanned both the public and private sectors – from radioactive waste cleanup efforts to new nuclear construction to nuclear research and development. And finally to the Appropriations Committee here in the United States Senate.

Early in my career, I served as a consultant to the National Governors Association's Federal Facilities Task Force, a forum for state governments to collectively interact with the Department of Energy on cleanup of the Cold War nuclear weapons complex. That experience instilled in me a deep sympathy for state and local governments' desire to have input and influence on federal decisions affecting their jurisdictions.

Later, I was a consultant to the Department of Energy on the economics and governance of uranium enrichment decontamination and efforts to close the fuel cycle through reprocessing and advanced reactor technologies. I also helped a major east coast utility conduct a project risk assessment of new nuclear construction. I gained an appreciation for how private sector entities decide to make investments in nuclear power and technology, and how government programs can influence those decisions.

As a career civil servant at the Department of Energy, I managed the Department's relationship with Congressional Appropriations Committees – learning the value of congressional engagement and oversight in holding agencies accountable for spending and policy decisions.

For the past six years, I've served as professional staff on the Energy and Water Appropriations Subcommittee overseeing the NRC's budget and operations, nuclear energy research and development programs, as well as nuclear national security efforts. One of the most rewarding aspects has been the collegiality and close bipartisan working relationships among staff on the Committee.

If confirmed, I intend to bring these varied experiences to my tenure at the NRC – a passion for public participation and transparency, respect for private sector decision-making, appreciation of Congressional oversight, and a commitment to collegiality.

The NRC faces a complex set of challenges in the coming years – overseeing increased plant closures, regulating a current fleet ever more important to clean energy goals, and preparing to license a diverse array of new reactor technologies. With a deep commitment to public service and a safe nuclear industry, I feel I would be coming full circle with a role at the NRC.

In closing, I am humbled by the prospect of joining the other members of the Commission, including Commissioner David Wright, here today, each of whom brings a wealth of knowledge, experience, and insight to regulating the civilian use of nuclear materials and power.

Thank you, Mr. Chairman, and I look forward to your questions.

# **SAMPLES OF RESPONSES TO POST- HEARING QUESTIONS**



CHAIRMAN

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

June 14, 2017

The Honorable John Barrasso  
Chairman, Committee on  
Environment and Public Works  
United States Senate  
410 Dirksen Senate Office Building  
Washington, D.C. 20510-6175

Dear Chairman Barrasso:

I appeared before the Committee on Environment and Public Works on June 13, 2017, at a hearing entitled, "Hearing on the Nominations of Kristine Svinicki (Reappointment), Annie Caputo and David Wright to be Members of the U.S. Nuclear Regulatory Commission, and the Nomination of Susan Bodine to be Assistant Administrator of the Office of Enforcement and Compliance Assurance of the U.S. Environmental Protection Agency." In response to the Committee's letter of June 13, 2017, enclosed please find my responses to questions for the record, directed to me, from that hearing.

If I can be of further assistance, please do not hesitate to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read "K. Svinicki", written in a cursive style.

Kristine L. Svinicki

Enclosure: As stated

Identical letter sent to the Honorable Thomas Carper.

**Senate Environment and Public Works Committee  
Hearing entitled, "Hearing on the Nominations of Kristine Svinicki  
(Reappointment), Annie Caputo and David Wright to be Members of the U.S.  
Nuclear Regulatory Commission, and the Nomination of Susan Bodine to be  
Assistant Administrator of the Office of Enforcement and Compliance Assurance  
of the U.S. Environmental Protection Agency."**

**June 13, 2017**

**Questions for the Record for Kristine Svinicki**

**THE HONORABLE COREY BOOKER**

**QUESTION 1.**

Some private sector companies are working on new technologies such as fusion reactors and sub-critical reactors that are not currently subject to NRC review. If NRC was to amend its definition of "nuclear reactor" to cover advanced reactors such as these, do you believe that NRC should subject these technologies to the existing regulatory framework designed for light water reactors, or would you expect that NRC would instead quickly develop a more appropriate risk based regulation for these types of inherently safer technologies?

**ANSWER.**

While the current regulations provide the NRC with sufficient flexibility to review and appropriately make conclusions on the safety and security on all reactor designs, the NRC acknowledges the potential inefficiencies for non-light water reactor (LWR) applications reviewed against existing LWR criteria. Therefore, the NRC is enhancing its existing framework in a technology-neutral manner to increase efficiency, timeliness, and predictability of non-LWR reviews. If reconfirmed as Chairman, I commit to continuing to support these efforts.

**THE HONORABLE EDWARD MARKEY**

**QUESTION 2.**

The 2005 Energy Policy Act includes a provision, which I authored, that mandates that the NRC conduct security inspections at U.S. nuclear power plants. These inspections must include force-on-force exercises, where a mock adversary force conducts a simulated attack on a power plant to probe potential gaps in the plant's security.

These exercises allow the NRC to ensure that nuclear power plants are adequately protected against terrorists or other bad actors. The alternative – of having plant operators run their own exercises – would not only violate the law, but it would also create a clear conflict of interest, and undermine public safety.

In the past, the nuclear industry lobbied the NRC to get rid of its force-on-force exercises in favor of exercises conducted by power plant operators. In effect, this would have nuclear power plant operators inspect themselves, in violation of the law.

**Do you support security evaluations of nuclear power plants that are conducted by the Nuclear Regulatory Commission, and not by licensees?**

**ANSWER.**

Section 170D of the Atomic Energy Act of 1954, as amended, requires the NRC to conduct triennial security evaluations at facilities designated by the Commission. These security evaluations must include a force-on-force (FOF) exercise that simulates security threats in accordance with the Design Basis Threat to the maximum extent practicable. Additionally, the Commission must mitigate any potential conflict of interest that could influence the results of an FOF exercise. Section 170D does not specifically state that the NRC must conduct these FOF exercises. If the NRC was petitioned to amend its regulations to have licensee-conducted FOF exercises, the Commission would need to determine whether that proposal would meet the requirements of Section 170D in order for such a change to be permissible. This determination has not been made.

**QUESTION 3.**

**When Entergy announced its intention to cease operations at the Pilgrim Nuclear Power Station, the Nuclear Regulatory Commission promised that the closure would “not relieve [Entergy] of the responsibility of running that plant as safely as possible until the end of its life.”**

**But in the last several months, the NRC has broken that promise by providing Pilgrim with exemptions from critical safety upgrades. After the Fukushima nuclear disaster in 2011, the Fukushima Near-Term Task Force recommended a series of safety upgrade for America’s nuclear fleet. The NRC opted to accept these recommendations, and apply them to reactors of the same design as Fukushima, like Pilgrim.**

**Among the critical safety upgrades were the requirement to reevaluate and address the risk of earthquakes and floods. The other critical safety upgrade was to install hardened containment vents capable of operating under severe accident conditions. These are meant to prevent the release of radioactivity in the event of a terrorist attack or severe accident.**

**But instead of requiring Entergy to carry out these commonsense safety upgrades, the NRC provided Pilgrim with exemptions**

**Do you believe that providing exemptions from NRC safety regulations to U.S. nuclear plants increases public confidence in the safe operation of those plants?**

**ANSWER.**

The practice of considering exemptions is a well-established part of the NRC’s regulatory process that allows licensees to address site-specific situations or implement alternative approaches for circumstances not necessarily contemplated in the regulations. A key part of the NRC’s review of an exemption request is the determination that granting the exemption will not present an undue risk to the public health and safety and is consistent with the common defense and security. This determination, combined with the NRC’s inspection oversight of the licensee’s implementation of safety regulations, license requirements, and the conditions of the exemption, provide assurance that the safe operations of facilities to which an exemption has been granted will be maintained.

**QUESTION 4.**

**Do you intend to continue granting exemptions to nuclear plants that have announced their intention to shut down operations?**

**ANSWER.**

The NRC considers the use of exemptions to be an appropriate and essential part of our regulatory program. Exemptions allow licensees to address site-specific situations or implement alternative approaches for circumstances not necessarily contemplated in the regulations or to seek regulatory relief from existing requirements to address special circumstances, such as when application of the regulation in the particular circumstance is not necessary to achieve the underlying purpose of the rule, or to avoid undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted. The exemption process also allows the NRC to grant appropriate regulatory relief that permits permanently shut down power reactor licensees to develop programs that are commensurate with the site-specific risks, and to focus resources on decommissioning, while continuing to maintain adequate measures to protect the health and safety of the public and not endanger common defense and security.

Several reactors in the U.S. are transitioning to decommissioning. During the transition period, numerous site-specific licensing actions are required to revise the plant's licensing basis to reflect the diminished potential for accidents and reduced risk after permanent shutdown and defueling. The NRC's current process establishes an appropriate regulatory framework for decommissioning a plant; however, the NRC has initiated a decommissioning rulemaking that could reduce the numerous licensing actions needed during the transition period. The proposed rule will be provided for Commission consideration in 2018. Until the rulemaking is complete, NRC and licensees will continue to follow the existing licensing action approach to transition to decommissioning, which may include granting site-specific exemptions on a case-by-case basis.

**QUESTION 5.**

**The recent National Academies of Sciences report on lessons learned from the Fukushima nuclear disaster noted that the risk of a spent nuclear fuel fire may actually rise at a decommissioned nuclear plant, because "the pool may be filled to near capacity and some plant safety systems may be inoperable." Yet the Commission has made it a habit of providing exemptions to decommissioned reactors from emergency response and security regulations. Exempting these plants from NRC rules wholesale permits the nuclear industry to lower the safety margin at decommissioned reactors, which continue to have dangerous spent nuclear fuel on site.**

**Do you agree that the danger of accidents at spent-fuel pools at decommissioned reactors warrants the application of all emergency response and security regulations that are designed to protect against spent fuel fires?**

**ANSWER.**

While NRC regulations support the agency's statutory mission to promote the common defense and security and to protect the health and safety of the public, a licensee may at times seek exemptions from emergency planning or security requirements to reflect the lower risk and reduced security focus associated with a power reactor being permanently shut down. These exemption requests are evaluated on a case-by-case basis, and are granted only if a licensee demonstrates that the applicable regulatory criteria in 10 CFR § 50.12(a) or 10 CFR § 73.5 are met.

**QUESTION 6.**

**In June 2016, I wrote to the NRC to urge the Commission to re-examine and address the risk to public safety posed by overcrowded spent-fuel pools at commercial reactors, in light of two reports that identified serious gaps in the NRC’s previous analysis. A fire in a densely-packed spent-fuel pool could result in health and economic consequences comparable to those caused by an accident at an operating reactor, including the displacement of millions of people and untold economic damage. These risks could be much reduced by transferring spent fuel to dry casks, which are more resilient against accidents or attacks.**

**The National Academy of Sciences (NAS) report, *Lessons Learned from the Fukushima Nuclear Accident for Improving Safety and Security of U.S. Nuclear Plants*, recommends that the NRC “perform a spent fuel storage risk assessment to elucidate the risks and potential benefits of expedited transfer of spent fuel from pools to dry casks.” Do you intend to carry out this recommendation? If not, why not?**

**ANSWER.**

The U.S. Nuclear Regulatory Commission (NRC) staff has previously evaluated expediting the transfer of spent fuel from pools to dry casks. Based on the staff’s assessment, the Commission decided that, due to the low risk to public health and safety from spent fuel pool storage, additional regulatory action is not needed. The agency’s evaluation was supported by several studies of spent fuel storage, for both pools and dry cask storage, performed or sponsored by the NRC. The NRC also evaluates operational experience and risk assessments performed by the scientific and international community, industry, and members of the public to ensure the risks posed by spent fuel pools and dry cask storage are understood and are adequately addressed by regulatory requirements. In addition, the NRC staff participates in international activities associated with assessing and addressing potential issues related to the storage of spent fuel. The NRC staff reassessed the NAS recommendation and found that existing studies and ongoing activities noted above are sufficient to support regulatory decisions on the safety and security of spent fuel pools.

**QUESTION 7.**

**The NAS report recommended that the NRC “strengthen their capabilities for identifying, evaluating, and managing the risks from terrorist attacks,” and that the NRC’s spent fuel storage risk assessment “should address accident and sabotage risks.” Do you agree with the NAS recommendation that the NRC must fully account for the risk of terrorism and sabotage in its re-assessment of spent-fuel risks? If not, why not?**

**ANSWER.**

Plant security is one of many topics within the NRC’s risk-informed, performance-based framework that is assessed in combination with, but not fully integrated into, probabilistic risk assessment models. The NRC has used and will continue to use risk insights in the security area to ensure an appropriate level of security is maintained at NRC-regulated facilities. Security issues were extensively assessed in studies and regulatory analyses following the terrorist attacks of September 11, 2001. As a result, enhanced security requirements were

established to reduce the risks of radiological sabotage at nuclear power plants, including consideration of spent fuel pools.

**QUESTION 8.**      **What steps, if any, will you support to strengthen the NRC’s capabilities for identifying, evaluating, and managing the risk of terrorist attacks on nuclear facilities, including spent-fuel storage sites?**

**ANSWER.**

The NRC works in close cooperation with other Federal agencies to continually assess the possible nature and likelihood of security threats, and determine if changes to plant security programs are needed. In addition, the NRC and industry response to the September 11, 2001, terrorist attacks included plant changes as part of mitigating strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with loss of large areas of the plant due to explosions or fire. The NRC staff assessed the NAS recommendation and did not identify a need to initiate new activities or to otherwise redirect resources to revise existing programs or to accelerate initiatives to enhance the use of risk assessment techniques in the security area.

**QUESTION 9.**      **As the Fukushima disaster demonstrated, a major release of radioactivity at a nuclear plant could have significant societal effects. As such, to fully capture spent-fuel storage risks, the NAS report recommended that the NRC’s analysis “[c]onsider societal, economic, and health consequences” of a spent-fuel fire, as well as the direct risks of radioactive release. Do you agree with this recommendation? If not, why not?**

**ANSWER.**

The NRC staff evaluated changing its approach to analyzing severe accident scenarios and related costs and benefits of new regulatory requirements after the accident at the Fukushima Dai-ichi nuclear power plant in Japan. The staff’s 2012 assessment was provided to the Commission in the publicly available report, "Consideration of Economic Consequences within the U.S. Nuclear Regulatory Commission's Regulatory Framework,"(SECY-12-0110). At that time, the Commission determined that major changes such as those cited in the NAS recommendation were not needed to support its regulatory decisions on whether new requirements were needed for operating nuclear power plants. Further, in performing economic analyses, the NRC does consider public health, occupational health, environmental considerations, and property impacts.

**QUESTION 10.**      **According to the NAS report, the NRC “has not carried out an independent examination of surveillance and security measures for protecting stored spent fuel,” as recommended by the NAS’s 2006 report. As such, the 2016 NAS report recommended that the NRC fulfill this recommendation, and that the NRC’s analysis “should include an examination of the effectiveness of [the NRC’s] programs for mitigating insider threats.” Do you support carrying out an independent examination, as recommended by both NAS studies? If not, why not?**

ANSWER.

The NRC establishes strategic goals and measures and issues routine reports regarding its performance related to its safety and security goals. In the security arena, the NRC also works closely with other Federal agencies to identify and address possible threats. In addition to the NAS studies, the NRC has obtained independent assessments in the security area from the NRC's Office of the Inspector General (OIG), U.S. Government Accountability Office (GAO), and other oversight bodies. Further, the staff routinely assesses information gained from operating experience, the inspection program, insights from drills and exercises, and the agency's participation in various international activities. Therefore, after evaluating the NAS recommendation, the NRC staff concluded that another independent assessment is not necessary, given that the NRC's requirements to ensure security of nuclear power plants and spent fuel storage will continue to be the subject of independent reviews by the OIG, GAO, and other organizations. The staff will also continue to benefit from independent insights gained from interactions with other Federal agencies, international bodies, licensees, and other stakeholders.

QUESTION 11.

**According to an article in the May 26 issue of *Science* magazine, the NRC's previous assessment of spent-fuel risks ignored the potential damage from a spent fuel fire beyond 50 miles of a plant, despite the fact that a significant portion of the radiation exposure would occur beyond that radius. Failing to account for this factor led the NRC to underestimate the destruction of a spent fuel fire. Do you support inclusion of contamination and other effects beyond 50 miles in the NRC's assessment of spent fuel fire risks?**

ANSWER.

The NRC will continue to evaluate any new information that arises in this area and assess its impact to existing regulatory requirements.

QUESTION 12.

**According to the *Science* magazine article, the NRC's previous analysis also assumed that, in the event of a spent fuel fire, contaminated areas could be effectively cleaned up within a one year timeframe, despite evidence from both the Chernobyl and Fukushima accidents. Do you support revising that assumption in any re-assessment by the Commission of spent-fuel risks?**

ANSWER.

The NRC will evaluate any new information that arises in this area and assess its impact to existing regulatory requirements.

QUESTION 13.

**According to the recent NAS study, under NRC rules, if the risk of prompt and cancer fatalities in the vicinity of a nuclear accident falls below a certain threshold, the NRC is not required to undertake a cost-benefit analysis of strategies for mitigating that risk. As a result of this rule, even though a spent-fuel fire could displace millions of people and result in trillions in economic damage, the NRC would not be required to evaluate the costs and benefits of strategies to mitigate such an event because it would not necessarily produce a significantly higher risk of fatalities in the immediate vicinity of the plant. To address this obvious deficiency, the NAS study cites experts who have suggested that the NRC should amend its rules by**

**setting a limit on the likelihood that a large number of people would be displaced for a long-term period following a release of radioactive fall-out. Do you support implementing such a rule?**

ANSWER.

The NRC considers a broad range of costs and benefits when determining whether to require safety enhancements at nuclear power plants. The NRC's NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook," directs that a value-impact analysis consider a wide range of attributes that could be affected by the proposed regulatory action (e.g., a proposed safety enhancement at a nuclear power plant). One of these attributes, discussed in Section 5 of NUREG/BR-0184, considers changes to offsite property in various forms, including costs of evacuations and indirect impacts to tourism and other industries. This same analysis also considers interdiction measures, such as decontamination and cleanup costs.

**THE HONORABLE BERNARD SANDERS**

**QUESTION 14.**

**As you know, the Vermont Yankee Nuclear Power Station is in the process of decommissioning. The Nuclear Regulatory Commission (NRC) requested comments on a draft regulatory basis ending this month to support a rulemaking that would amend NRC's regulations for the decommissioning of nuclear power reactors. The NRC's goals in amending these regulations would be to provide for an efficient decommissioning process; reduce the need for exemptions from existing regulations; address other decommissioning issues deemed relevant by the NRC staff; and support the principles of good regulation, including openness, clarity, and reliability. If confirmed, will you commit to supporting the following decommissioning requirements for the decommissioning rulemaking? If not, why?**

- **The enhancement of community involvement by requiring licensees of decommissioning reactors to include state and local officials' input into licensees' decommissioning plans;**
- **that decommissioning funds are used strictly for statutorily-authorized purposes;**
- **that spent nuclear fuel be removed from wet storage and placed into safer dry cask storage as quickly as possible;**
- **that the site of the plant is rapidly returned to beneficial use instead of decades after the plant ceases operations, and that licensees maintain or obtain the financial resources necessary to do so; and**
- **that all emergency preparedness and response, and security resources and licensing requirements, remain in place until all the spent nuclear fuel is placed into safer dry cask storage or removed from the site.**

ANSWER.

At this stage of the rulemaking process, as a member of the Commission, voicing support for specific issues could impede the open and transparent rulemaking process employed by the

staff as it engages with the public and stakeholders in formulating the draft and final rule, which NRC Staff will then present to the Commission for its consideration.

**QUESTION 15.**      **What do you believe should be the process for reviewing and processing public comments in the rulemaking and other formal proceedings? How should public comments be weighed by the Commission against comments from the industry?**

**ANSWER.**

The NRC Staff adheres closely to the Administrative Procedure Act in all aspects of its rulemaking process. This includes the notice and comment process whereby NRC Staff engages with the public to receive comments on its proposed rules. Each comment is independently evaluated by the NRC Staff as it refines the draft rule into the final rule. If confirmed, I will continue to support the NRC Staff in this process and ensure that the Staff closely adhere to the requirements in the Administrative Procedures Act.

**QUESTION 16.**      **How should the NRC educate the public about the existence and meaning of the ongoing decommissioning rulemaking process? What should be NRC's plan for community outreach for the remainder of this decommissioning rulemaking process?**

**ANSWER.**

The NRC extends opportunities to participate in the agency's regulatory process, including rulemaking activities, to a diverse body of stakeholders and the general public. Typically, the public is given 75 to 90 days to provide written comments for consideration on rulemaking actions. The NRC uses the government-wide Web site <http://www.regulations.gov> to provide an easy way for members of the public to access and comment on NRC rulemaking actions.

In the case of the decommissioning rulemaking, the NRC issued An Advance Notice of Proposed Rulemaking in November 2015. The NRC received 161 public comment submissions, which are being considered as part of the development of the regulatory basis for the proposed rule. A proposed rule is expected to be provided for the consideration of the Commission in May of next year. If the proposed rule is approved by the Commission, the NRC will subsequently seek public comments to help inform the final rule.

**QUESTION 17.**      **Should NRC plan public field meetings to gather comments or testimony from communities where nuclear plants are decommissioning now, or will be soon? If not, why?**

**ANSWER.**

The NRC has hosted public meetings to discuss the decommissioning rule. While the NRC may not be able to host meetings near all the nuclear plants that have announced premature shutdown, the NRC offers stakeholders the option to participate in our public meetings in a variety of ways, for example, they can participate in person or via telephone conference. The agency has also expanded its use of Web conferencing to allow participation by anyone with access to a computer, minimizing travel costs and increasing opportunities for public involvement.

**QUESTION 18.**      **What is the justification for the NRC to continuously waive its own regulations, especially those pertaining to the decommissioning**

**trust fund, even though it is working to create new decommissioning rules?**

ANSWER.

A licensee may at times seek exemptions from emergency planning requirements to reflect the lower risk and reduced security focus associated with a power reactor being permanently shut down. These exemption requests are evaluated on a case-by-case basis, and are granted only if a licensee demonstrates that the applicable regulatory criteria in 10 CFR 50.12(a) or 10 CFR 73.5 are met.

**QUESTION 19.      What justification is there for the NRC to approve withdrawals from Vermont Yankee's Decommissioning Trust Fund for spent fuel management when NRC's regulations expressly prohibit such use? (10 C.F.R. § 50. 75 at FN 1.)**

ANSWER.

Under NRC regulations, some licensees choose to place funds in their decommissioning trusts to pay for costs associated with spent fuel management and site restoration. Vermont Yankee Nuclear Power Station sought regulatory exemptions to use decommissioning trust funds for spent fuel management expenditures on the grounds that the amount of money projected to be in the fund exceeded the amount projected to be needed for radiological decommissioning. The NRC has approved the request to use these excess funds, consistent with the criteria set forth in Title 10 of the Code of Federal Regulations (10 CFR) 50.12.

In approving this exemption, allowing withdrawals from decommissioning trust funds for spent fuel management, the staff acted under the authority delegated to it by the Commission. The staff found the exemptions were authorized by law, concluded the exemptions presented no undue risk to public health and safety and were consistent with the common defense and security, and determined that special circumstances existed.

**QUESTION 20.      Former NRC Chair Allison Macfarlane authored a paper in 2003 along with other experts that concluded that dry cask storage offers compelling advantages over wet pool storage: it is safer and it is less prone to failure. They recommended that spent fuel should be transferred from wet pools to dry cask storage within five years of discharge to reduce the risk of fire and subsequent radioactive contamination of air and land. Do you have a position on dry cask versus wet pool storage? If confirmed, will you commit to supporting more studies of this issue?**

ANSWER.

The NRC's responsibility is to ensure that spent nuclear fuel is managed safely and securely in either wet or dry storage. Both storage modes have been determined to be safe. In May of 2014, the Commission approved the staff's recommendation not to pursue additional study to assess possible regulatory action to require expeditious transfer of spent fuel from nuclear power plants' spent fuel pools to dry cask storage. In my vote on this question, I noted the large body of evidence presented by the staff, and concluded that this record, taken as a whole, overwhelmingly supported the staff's recommendation. If reconfirmed, I would support more studies of this issue should new and significant information on this matter be developed.

**QUESTION 21.**

**State regulatory officials from Vermont have raised concerns that the NRC is less likely to consider commentary received from state and local governments on reactor license change requests, and NRC rulemaking and regulatory guidance efforts, than commentary from nuclear power plant operators (e.g. Entergy, Exelon and First Energy) and nuclear power industry organizations such as the Nuclear Energy Institute (NEI). If confirmed, what steps would you take to assure that commentary and concerns expressed by state and local governments, or other nuclear power plant stakeholders, are given consideration equal to that already enjoyed by nuclear power plant operators and their supporters?**

**ANSWER.**

Under the Administrative Procedure Act and the Atomic Energy Act of 1954, as amended, the NRC has an obligation to provide stakeholders, including state and local governments, with an opportunity to participate in rulemakings and adjudications and must consider the input from all entities in developing the final agency action. As an additional matter, the agency frequently makes its guidance documents available to members of the public for a similar opportunity to comment. The State of Vermont has often participated in these activities, and last year prevailed in its adjudicatory claim that the agency staff should have prepared an environmental assessment for an exemption request related to the Vermont Yankee decommissioning fund. *Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), CLI-16-17, 84 NRC 99 (2016). If reconfirmed, I commit to ensuring that the agency continues to meet its legal obligation to consider input from interested stakeholders in an even-handed manner.

**QUESTION 22.**

**To date, nuclear power plants that have permanently shut down have been permitted to eliminate their offsite Emergency Planning Zones (EPZs) roughly 15 to 20 months after cessation of power generation. The risk of a spent fuel fire resulting from a significant loss of spent fuel pool water inventory is greatly reduced, but a reduction in risk is not an elimination of risk. A reduced risk of a spent fuel fire still requires a significant offsite emergency response that requires drills or exercises to demonstrate proficiency in response and funding to maintain essential emergency response equipment and staff. If confirmed, will you support maintaining offsite EPZs for permanently shut down nuclear power plants until such time that all spent fuel is removed from onsite spent fuel pools?**

**ANSWER.**

Following the permanent removal of all spent fuel from the reactor vessel, the range of events that can have significant offsite consequences is greatly reduced. As a result, some decommissioning licensees have requested relief from emergency planning requirements that do not reflect the reduced risk. If these exemptions are granted, licensees must continue to maintain an onsite emergency plan addressing the declaration of an emergency up to the second-lowest classification level ("Alert"), capability to notify licensee personnel and offsite authorities of emergencies, onsite exercises with the opportunity for offsite response organization participation, arrangements for offsite response organizations (i.e., law

enforcement, fire and medical services) that could respond to onsite emergencies, and coordination with designated offsite government officials following an event declaration so that, if needed, offsite authorities can implement appropriate response actions. If reconfirmed, I will continue to approve exemptions that are authorized by law and maintain an appropriate level of safety at the facility in question, subject to the NRC staff's specific evaluation.

**QUESTION 23. When NRC staff respond to concerns raised by state or local government officials, or individual concerned citizens, they rely heavily on references to voluminous regulatory documents which are difficult to follow, or use jargon that only makes sense to other NRC staff. If confirmed, what actions would you consider taking to facilitate clear communication by NRC officials with lay members of the public?**

**ANSWER.**

The Commission has directed staff to make greater use of plain language when speaking to the public, particularly about high profile events, such as the nuclear accident at Fukushima-Daiichi in Japan. In addition, the NRC's Executive Director for Operations has issued guidance to the staff on improving the quality of documents, emphasizing clarity of writing and the use of plain language, with links to training opportunities. Finally, the agency held approximately 1,000 public meetings last year, at many of which members of the public had opportunities to ask the technical staff questions or engage in discussions before or after the meeting. These meetings provide an important opportunity for members of the public to better understand regulatory issues. If confirmed, I will continue to emphasize the need for clear communications, consistent with the Principles of Good Regulation.

**QUESTION 24. One significant source of frustration for state and local governments, and individuals who are following nuclear power plant decommissioning efforts, is that the process of complete decommissioning and site restoration is under the jurisdiction of multiple federal agencies in addition to the NRC, such as the Environmental Protection Agency, the Department of Energy, the Department of Transportation, and the Department of Homeland Security, just to name a few. If confirmed, what steps would you take to assure that the scope of regulatory authority of all federal agencies with jurisdiction is clear to all stakeholders?**

**ANSWER.**

As discussed above in response to question 23, the NRC has undertaken extensive efforts in recent years to improve the clarity of its communications with interested stakeholders. If reconfirmed, I will continue to support these efforts.

**QUESTION 25. What do you believe is the future of nuclear power in this country?**

ANSWER.

Nuclear power is likely to provide some fractional component of U.S. energy supply in the future at levels dependent on economic and other factors outside of the NRC's jurisdiction.

**QUESTION 26.      If confirmed, what role do you believe you should play—if any—as Commissioner in supporting the nuclear power industry?**

ANSWER.

As an independent agency, the NRC does not play a promotional role for the nuclear power industry. The mission of the NRC under law is to license and regulate the Nation's civilian use of radioactive materials to protect public health and safety and promote the common defense and security.

**QUESTION 27.      According to recent Energy Information Agency estimates, the generating capacity from nuclear power will drop from 20 percent to 11 percent by 2050. If confirmed, how will you ensure safety during this time of mass decommissioning?**

ANSWER.

The NRC ensures that safety requirements are being met throughout the decommissioning process by reviewing decommissioning or license termination plans, conducting inspections, and monitoring the status of activities to ensure that radioactive contamination is reduced or stabilized. The agency's previous experience in the 1990s, and currently, with groups of nuclear power plant ceasing operations before the end of their license terms and decommissioning at the same time, provided lessons learned regarding the safety oversight program for decommissioning sites. As more facilities complete decommissioning, the NRC has implemented those lessons learned in order to improve the effectiveness and efficiency of the safety oversight program for decommissioning sites and is currently undergoing rulemaking to further increase effectiveness and efficiency. If reconfirmed, I will continue to support these activities.

**QUESTION 28.      Most of the plants currently being decommissioned across the U.S. are doing so because they are not economically competitive. Some have proposed easing safety and other regulatory burdens to help the economic viability of the nuclear fleet. If regulations on existing and new power plants are decreased, how will you ensure the safety of our nuclear fleet?**

ANSWER.

While the Commission is aware of the economic pressures resulting from competition in the energy sector generally, the Commission's role as a regulator is to ensure that the Nation's nuclear plants operate safely, consistent with the agency's health and safety mission. The NRC will continue to maintain adequate measures to protect the health and safety of the public and not endanger common defense and security. If reconfirmed, I will continue to support these efforts.

**QUESTION 29.      If confirmed, how will you ensure the public safety of next-generation nuclear reactors that implement advanced technologies?**

ANSWER.

NRC maintains communication with and awareness of the Department of Energy and private industry activities so that we are aware of new and emerging technologies. This enables NRC to address regulatory policy issues in a timely manner and to be prepared to engage in pre-application and licensing reviews to ensure the safety and security of licensed designs.

Throughout the preparatory activities, we will ensure that the focus remains on safety -- NRC will independently verify applicant's data, determine safety margins, and explore uncertainties. If reconfirmed, I will continue to support these activities.

**QUESTION 30.      How will the potential development of advanced nuclear technologies affect the problems NRC is currently confronting in storing spent nuclear fuel long-term?**

ANSWER.

The NRC expects that its current regulatory structure provides the necessary flexibility through the use of a risk-informed, performance-based framework to accommodate on-site storage, potential offsite interim storage and, when available, geologic disposal of alternate waste forms arising from advanced reactor fuel cycles.

**QUESTION 31.      Currently the U.S. has no permanent storage for spent nuclear fuel. Where do you anticipate that spent nuclear fuel from next-generation nuclear reactors will be stored?**

ANSWER.

For spent fuel and high-level waste disposal, the NRC expects that the use of a risk-informed, performance-based framework would provide adequate flexibility to accommodate on-site storage, potential offsite interim storage and, when available, geologic disposal of alternate waste forms arising from advanced reactor fuel cycles.

**QUESTION 32.      The March 2011 Fukushima nuclear accident prompted the NRC to review its own regulations. The Commission's Fukushima Task Force, consisting of NRC experts with 135 years of nuclear regulatory expertise among them, made a range of key recommendations for improving nuclear plant safety. The final report included 12 recommendations ranging from requirements to upgrade seismic and flood protections to protections against the long power outages that were the ultimate cause of the Japanese meltdowns. They also concluded that all of the recommendations were necessary for the "adequate protection" of nuclear power plants. Despite the repeated urging of its own experts, the Commission has so far refused to make these recommendations mandatory. What steps will you take to ensure that the Commission revisits this decision and does, in fact, adopt the Task Force's safety recommendations as mandatory?**

ANSWER.

Following the issuance of the Task Force Report, the NRC staff prioritized the recommendations based on the urgency of the action and the need for additional information to develop an approach. The NRC staff has since evaluated all of the recommendations and developed an approach to addressing them. The orders, in particular, are mandatory. For example, the majority of plants are in compliance with the Mitigating Strategies Order, which requires plants to be able to maintain safety functions during long power outages. The need for upgrades for seismic and flooding protections will be determined on a plant-specific basis based on the results of ongoing evaluations; in many cases, plants have made interim improvements while the more detailed evaluations are being completed. The most safety-significant activities are either complete or progressing under clearly defined processes. If reconfirmed, I will continue to support the agency's plan for prioritizing and implementing the recommendations from the Task Force Report.

QUESTION 33.

**A paper published in *Science* last month by nuclear experts from the Union of Concerned Scientists and Princeton University argued that the NRC places the U.S. at risk of disasters like Fukushima because of problems in its approach to assessing the risks and benefits of safety improvements. The authors suggest that NRC should reform its risk assessments in the following ways (see below). Do you concur that these corrections to current NRC risk assessments are needed? If not, why? If so, how will you address these issues as a Commissioner, if confirmed?**

- **Take into account the possibility of a terrorist attack in regulatory decisions such as the one on whether or not to require the nuclear utilities to remove spent fuel to dry cask storage after 5 years.**
- **Take into account accident consequences beyond 50 miles of the site.**
- **Make assumptions concerning population relocation, and therefore property losses, after a nuclear accident consistent with the EPA's guidance concerning dose levels.**
- **Make realistic assumptions concerning the efficacy and speed of decontamination actions.**
- **Update the NRC's assumption concerning the value of a life lost to radiation-induced cancer by a factor of 2.5, as recommended by the NRC staff.**

ANSWER.

Over the past several years, the NRC staff has evaluated these issues. In the first four cases, the staff has found that the agency's existing approach provides for reasonable assurance of adequate protection of public health and safety and common defense and security. The Commission has endorsed the staff's findings and recommendations in these matters. The staff is reviewing the article referenced in this question. The staff's proposal regarding the dollar per person-rem conversion factor (which is described in the fifth case above) remains under Commission review and deliberation.

QUESTION 34.

**A February 2017 report by Union of Concerned Scientists stated, "Just as nuclear plant owners have downplayed and dismissed clear and present signs about safety culture problems at their plants, the data suggest that the NRC's management is just as dismissive of**

**indications that it has a poor safety culture.” Are you concerned that staff at nuclear power plants and the NRC are reluctant to report safety problems because of the lack of trust between workforce and management? If so, how can NRC address the lack of a nuclear safety culture, and lessen risks to public and environmental safety? If not, what evidence do you have that NRC management maintains a robust safety culture?**

ANSWER.

Safety and security are the primary pillars of the NRC’s regulatory mission and consideration of both is an underlying principle of the Safety Culture Policy Statement issued in 2011. The Policy Statement communicated the Commission’s expectations that individual nuclear power plants establish and monitor a positive safety culture commensurate with the safety and security significance of their activities.

The NRC assesses our licensees’ Safety Conscious Work Environment (SCWE) through inspections, responses to allegations, and evaluation of performance deficiencies with a SCWE cross-cutting aspect. The NRC takes action, such as issuing chilling effect letters and orders, when it concludes additional actions are warranted to ensure that licensees take appropriate actions to foster a robust SCWE and safety culture.

Internally, the NRC is committed to fulfilling our important safety and security mission, while continuing to nurture an environment that reflects the characteristics of a strong safety culture that encourages all NRC employees and contractors to raise concerns and differing views promptly without fear of reprisal. When recent NRC employee surveys and self-assessments indicated the need for additional action, NRC’s management and staff partnered to develop an action plan that focuses on “fostering a greater climate of trust at the NRC” with the goals of strengthening the positive environment for raising concerns; promoting a culture of fairness, empowerment and respect across the agency; and establishing clear expectations and accountability for NRC leaders. I support these efforts.

QUESTION 35.

**NRC’s Office of Nuclear Material Safety and Safeguards (NMSS) is responsible for regulating activities which provide for the safe and secure production of nuclear fuel used in commercial nuclear reactors; the safe storage, transportation and disposal of high-level radioactive waste and spent nuclear fuel; and the transportation of radioactive materials regulated under the Atomic Energy Act. The United States is facing a significant long-term problem in its disposal of nuclear waste. What do you envision as a potential solution, and what role should NRC play?**

ANSWER.

The NRC’s authority to regulate the storage, transportation, and disposal of high-level waste comes from the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and the Nuclear Waste Policy Act of 1982, as amended. The NRC’s role under its authority is that of ensuring safety during transportation and the safety of any facility proposed for such storage or disposal. Those same statutes provide the U.S. Department of Energy (DOE) with the responsibility and authority for designing, constructing, operating, and decommissioning a permanent disposal facility for HLW, and potential interim storage facilities, under NRC licensing and regulation. In its role as a safety regulator, it is the NRC’s responsibility to process any such application regardless of the methods and technologies

utilized for transportation, storage, or disposal. The NRC has previously licensed a private fuel storage facility, and has made progress in the review of a geologic repository for HLW disposal. NRC will follow the national policy debate on disposal of HLW, but the establishment of or modification to this policy is the domain of the Congress.

**QUESTION 36.** President Trump's FY18 budget proposal would revive the approval process for Yucca Mountain nuclear waste site. NRC's role in approving the Yucca Mountain site has been to assess DOE's license application to consider whether the proposed facility meets its regulatory requirements for geologic disposal of the waste. The NRC process also includes conducting a Safety Evaluation Report and adjudicatory hearings before the Atomic Safety and Licensing Board. Adjudicatory hearings for Yucca Mountain, which must be completed before a licensing decision can be made, remain suspended. If confirmed, will you ensure robust public comment and involvement in any decision on a potential solution to this country's significant long-term problem of nuclear waste disposal?

**ANSWER.**

Yes.

**QUESTION 37.** According to the NRC, radioactive iodine 131 is the most toxic isotope used in medicine. Before 1997, patients receiving therapeutic doses of I-131 for thyroid cancer had to be kept in radiological isolation until it was safe for them to go home and mingle with the public. In 1997, however, a radical deregulation by the NRC made outpatient treatment with I-131 the norm. The U.S. is now an outlier in the world radiation protection community, with weaker controls than those not only of Europe and Japan, but also of Iran and Indonesia. We are a first-world country with sub-third world radiation protection for the public. During the Chairmanship of Allison Macfarlane, she and Commissioner Magwood sought to correct this situation, but lacking your support, their efforts failed. If reconfirmed, will you commit to correct this situation and address the need to protect the public from exposure to medical radioactive iodine contamination?

**ANSWER.**

The NRC believes the current criteria for the release of patients following radiation therapy contained in 10 CFR 35.75 adequately protect public health and safety. As directed in Staff Requirements Memorandum (SRM) COMAMM-14-0001/COMWDM-14-0001, "Background and Proposed Direction to NRC Staff to Verify Assumptions Made Concerning Patient Release Guidance," NRC staff has conducted additional research and is reevaluating its patient release regulatory requirements and guidance. The staff requested and is evaluating public input on this evaluation. The staff will provide their evaluation to the Commission in December 2017.

**QUESTION 38.** The National Council on Radiation Protection and International Commission on Radiological Protection both declare that the maximum radiation dose to a member of the public from a licensed activity should be 100 millirems per year. Yet the NRC allows all

**members of the public, including pregnant women and nursing mothers, to receive 500 millirems from released patients. If confirmed, will you commit to reconsidering the NRC's 500 millirems standard?**

**ANSWER.**

The NRC has conducted additional research and is currently reevaluating the existing patient release regulatory requirements and guidance, as directed in SRM COMAMM-14-0001/COMWDM-14-0001, "Background and Proposed Direction to NRC Staff to Verify Assumptions Made Concerning Patient Release Guidance." As part of this evaluation, the NRC staff is specifically looking at the allowable limits to pregnant women, nursing mothers, and children along with all members of the public. This evaluation includes input from a diverse group of stakeholders, including members of the public. The staff will provide its evaluation to the Commission in December 2017.

**QUESTION 39.**

**Within the past two weeks, doctors at Pennsylvania State University published a paper analyzing 44 cases of thyroid cancer in the vicinity of the Three Mile Island nuclear plant and found convincing evidence that they showed signs of exposure to radiation. In 2002, as part of the response to the 9/11 disaster, Congress authorized an expansion from 10 to 20 miles of the radius within which the drug potassium iodide would be distributed. At the time, the NRC fought that expansion, and under President Bush, the law was not implemented. If confirmed, will you commit to a re-evaluation of the need for greater availability of potassium iodide in view of increased evidence of the sensitivity of the thyroid gland to the carcinogenic effects of radiation?**

**ANSWER.**

The NRC believes that current emergency planning and protective measures--evacuation and sheltering--are adequate and protective of public health and safety. However, the NRC recognizes the supplemental value of potassium iodide and the prerogative of the States to decide the appropriateness of the use of potassium iodide by its citizens. The NRC is currently reviewing the paper published by Pennsylvania State University and will take regulatory action if it is warranted.

**QUESTION 40.**

**The NRC used to be considered one of the top federal agencies in workplace satisfaction. Yet, according to index scores from the U.S. Office of Personnel Management's Federal Employee Viewpoint Survey, employee satisfaction at NRC is the worst since 2005 with declines of 3.5 points in just the last year (2015 to 2016). This drop in the last year represents one of the steepest declines among agencies of its size. Moreover, scores on leadership are consistently down across all categories, including senior leadership, empowerment, and fairness. Having served as a Commissioner since 2008, how would you explain these declines in workplace satisfaction? If confirmed, what will you do in your role as chairman to address these declines?**

ANSWER.

The agency maintains a clear focus on safety and security, and carrying out its core mission of protecting people and the environment, even as we continue to face a number of challenges, such as adapting to fact-of-life changes. The agency traditionally scores well above the government average in the Federal Employee Viewpoint Survey (FEVS), but has seen a decline in overall scores over the past few years. However, in 2016, the Office of Personnel Management (OPM) still ranked the NRC in the top 10 among large agencies (i.e., agencies with 800 or more employees) in the areas of global satisfaction and employee engagement. The agency continues to evolve using data from the FEVS and the NRC Office of Inspector General Safety Culture and Climate Survey. The agency is also implementing an action plan that focuses on “fostering a greater climate of trust at the NRC” with the goals of strengthening the positive environment for raising concerns; promoting a culture of fairness, empowerment and respect across the agency; and establishing clear expectations and accountability for NRC leaders. If reconfirmed, I will continue to reinforce the continued progress on this action plan.

**QUESTION 41.      The first of the Nuclear Regulatory Commission’s five Principles of Good Regulation is “Independence.” What does that principle mean to you?**

ANSWER:

The Principle of Independence means that nothing but the highest possible standards of ethical performance and professionalism should influence regulation. However, independence does not imply isolation. All available facts and opinions must be sought openly from licensees and other interested members of the public. The many and possibly conflicting public interests involved must be considered. Final decisions must be based on objective, unbiased assessments of all information, and must be documented with reasons explicitly stated.

**QUESTION 42.      Would you agree that the Nuclear Regulatory Commission (NRC) should not allow political meddling from Congress, other parts of the executive branch, or industry to interfere with the NRC’s independent decision-making processes?**

ANSWER.

Yes.

**QUESTION 43.      Do you commit to zealously guard the independence of the NRC and oppose any efforts to undermine it?**

ANSWER.

Yes.

**THE HONORABLE DAN SULLIVAN**

**QUESTION 44.      Earlier this spring the Committee on Environment and Public Works reported S.512, the “Nuclear Energy Innovation and Modernization Act” on a strong bi-partisan vote. The findings and purposes of this bill provide a framework for these questions. In S.512 the Committee found that one of the “...impediments to the commercialization of advanced nuclear reactors...” is the “... durations associated with applying the existing nuclear regulatory**

framework to advanced nuclear reactors. We further found that “...license application reviews should be as predictable and efficient as practicable without compromising safety or security.” And, that “the existing nuclear regulatory framework and the requirements of that framework have not adapted to advances in scientific understanding or the features and performance characteristics of advanced nuclear reactor designs.”

To address these findings S.512 would establish “...a program to develop the expertise and regulatory processes necessary to allow innovation and the commercialization of advanced nuclear reactors”. S.512 provides the NRC with ample time to develop that program so, even if the bill were enacted this year, it will not be fully in place for several years.

Assuming that S.512 is enacted, I would like to understand your views with respect to the application of the NRC’s current regulatory authority to innovative nuclear technologies during the time between enactment and the establishment of this new program. Do you agree with the general findings of S.512? If not, please explain.

ANSWER.

There are many similarities between the requirements of S.512 and the NRC’s ongoing activities related to advanced reactors. In addition, the fundamental requirements in S.512 are complementary in concept to the NRC’s ongoing activities. The NRC can review innovative, non-light water reactor designs using our existing regulatory framework. This approach would continue to ensure safe, secure, and environmentally responsible uses of nuclear power. However, the NRC is enhancing its existing framework in a technology-neutral manner to increase efficiency, timeliness, and predictability of such reviews. The NRC currently has significant ongoing and planned activities in the areas of advanced reactor licensing infrastructure, technical preparation, and stakeholder outreach. In addition, the NRC, in coordination with DOE, is training NRC staff to close technical skills gaps, and performing outreach activities to educate the new vendors on the regulatory process. I support these efforts.

QUESTION 45.

**In this interim period, the Commission likely will be confronted with innovative and advanced nuclear technologies, e.g. subcritical technologies, which may not fit within the scope of the NRC’s current regulations. The Atomic Energy Act vests the NRC with broad authority to determine the scope of its regulatory jurisdiction, including the discretion to issue additional regulations to bring new technologies within the scope of the existing regulatory framework. In the event you encounter such an issue while serving on the NRC, what views will guide how you exercise your discretion with respect to regulation of such new technologies? Will you regulate simply to regulate or will you insist that there be regulation only when it is needed to adequately address public health and safety risks?**

ANSWER.

The NRC and its predecessor agency, the Atomic Energy Commission (AEC), have regulatory experience with non-light water reactor (non-LWR) designs, including licensing sodium fast reactors, sodium graphite reactors, and high temperature gas cooled reactors, and performing

pre-application reviews for additional non-LWR designs. The current regulations provide the NRC with sufficient flexibility to review and appropriately make conclusions on the safety and security on all reactor designs. The most important element of the review is for the vendor to readily demonstrate the safety of its design, especially for innovative or novel features. LWR-specific regulations that do not apply to non-LWR design features could be addressed through the use of the existing exemption process. In addition, policy issues can be addressed during pre-application interactions, which will allow the NRC to complete non-LWR reviews in a timely manner. If reconfirmed, I will continue to insist that NRC regulation be tied to protecting the public health and safety, promoting the common defense and security, and otherwise complying with applicable law.

**QUESTION 46.**      **Nuclear industry activities frequently are subject to regulation by many different federal agencies which often have different perspectives and objectives. If you are presented with a situation in which regulation of a new innovative technology by other agencies appropriately addresses any public health and safety risks presented by that technology, will you insist that the NRC also regulate?**

**ANSWER.**

Under the Atomic Energy Act of 1954, as amended, the NRC has a statutory obligation to "protect the health and safety of the public" and "promote the common defense and security" with respect to civilian applications of nuclear technology. Consequently, for any new technology, the Commission legally must have a reasonable basis for finding that these standards are met. Nonetheless, if compliance with existing regulations from another entity sufficed to ensure these standards were met, then I would not propose additional requirements beyond those required.

**THE HONORABLE SHELDON WHITEHOUSE**

**QUESTION 47.**      **Last year, NRC's budget included a \$5 million request to build up the infrastructure for improving licensing of advanced reactor concepts. This request was appropriated in this year's Omnibus. Unfortunately, in this year's budget request NRC does not ask for additional funding for their advanced reactor licensing work. Can you discuss what the NRC plans to do with the additional funding for advanced reactor licensing?**

**ANSWER.**

The NRC is enhancing its existing regulatory framework to address non-LWR in a technology neutral manner as part of its vision and strategy for safely achieving effective and efficient Non-Light Water Reactor (LWR) mission readiness. The FY 2018 budget does not include off-the-fee based funding for advanced reactors, but does include very limited on-fee based funding for non-LWR infrastructure development and pre-application interactions. Examples of activities underway include the development of advanced reactor design criteria and the NRC issued draft regulatory guide "DG-1330, "Guidance for Developing Principal Design Criteria for Non-Light Water Reactors," for formal public comment in February 2017. The NRC plans to issue a final regulatory guide at the end of 2017. In October 2016, the NRC issued a draft "Regulatory Review Roadmap for Non-Light-Water Reactors, which described flexible review options, including the use of a staged-review process and the use of conceptual design assessments

during the pre-application period. The NRC is working with stakeholders on a utility-led licensing modernization project supported by the Department of Energy and the Nuclear Energy Institute. White papers are being prepared by the utility-led working group and provided to the NRC staff as part of development of regulatory guidance for non-LWR applicants. The NRC staff is currently reviewing the first white paper on risk-informed performance based-licensing bases event selection.

**QUESTION 48.**      **Why did NRC not ask for additional funding in the President's FY2018 budget to continue its work in this area?**

**ANSWER.**

NRC's FY 2018 budget request was developed to ensure the agency can meet its mission and to be consistent with budgetary direction from the Administration.

**QUESTION 49.**      **There have been tremendous advances in predictive modeling and simulation capabilities for new nuclear technologies that can yield new insights into new reactor behaviors and accelerate the licensing of new technologies. Will you help direct the NRC staff to embrace and adopt these tools?**

**ANSWER.**

Yes. The NRC supports the appropriate use of computer models and simulation tools to evaluate the safety of nuclear technologies. Throughout the history of licensing nuclear technologies, the NRC has approved applications that rely on a combination of computer simulation modeling and experimental data to demonstrate compliance with NRC safety requirements. Given the importance of nuclear safety, sole reliance on computer simulation models needs to be approached deliberately. Computer simulation models need to be validated to assure that they appropriately model physical processes and accurately predict the results of phenomena of interest.

The NRC is currently evaluating several DOE computer simulation models for applicability and use for new and advanced reactor technologies. The NRC recognizes that computer simulation models can allow a greater number and range of issues to be analyzed. I will continue to be supportive of the NRC staff's use of appropriate evaluative tools to carry out the NRC's mission.

**QUESTION 50.**      **The Chinese currently have 21 new nuclear reactors under construction. The Chinese regulatory system appears to be similar to the new, post-Fukushima Japanese system, where the nuclear regulatory body is housed in the Environment Ministry. Although it appears that the Chinese regulatory systems seems to have similar licensing and regulatory authority to that of the U.S. NRC, their ability to license reactors appears to be more efficient. Can you discuss whether the current regulatory licensing framework at NRC is different than the Chinese licensing system? If so, what are the differences?**

**ANSWER.**

There are significant differences between the U.S. and Chinese regulatory licensing frameworks. The most significant differences appear to relate to transparency and public hearing rights. These differences are manifestations of our different systems of government.

**QUESTION 51.** Can you comment on what may be enabling the Chinese to be able to license 21 new reactors under their framework?

**ANSWER.**

The NRC's engagements with its counterpart in China have focused on technical safety issues rather than licensing framework, in light of the significant differences in governmental systems and national laws.

**QUESTION 52.** Has the NRC looked at a cross comparison between the Chinese licensing process and the U.S. system?

**ANSWER.**

While the NRC has not performed a cross comparison between the Chinese and US licensing processes, it does participate in the Multi-National Design Evaluation Programme (MDEP), of which the US and China are members. MDEP is a 10-nation initiative with the goal of cooperating on safety design reviews of new reactors and identifying opportunities to harmonize and converge on safety licensing review practices and requirements. When appropriate, the NRC has applied lessons learned through this process and technical exchanges with the Chinese Regulator to its licensing process.

**QUESTION 53.** The NRC budget includes \$30 million from the Nuclear Waste Fund to fund activities for the proposed Yucca Mountain deep geological repository. DOE has been collecting fees since 1983 under the Nuclear Waste Policy Act of 1982 to go into the Nuclear Waste Fund. Until 2010, DOE was collecting around \$750 million a year (nearly \$31 billion in total) into the fund. The fee program was stopped in 2010 after the Obama administration backed away from the planned nuclear fuel repository at Yucca Mountain. If you are confirmed as Commissioner and Congress passes funding for Yucca Mountain licensing do you plan on moving the licensing process forward?

**ANSWER.**

Yes. If Congress provides funding, the NRC would continue its review of the construction authorization application for a repository at Yucca Mountain.

**QUESTION 54.** If the licensing process for Yucca Mountain moves forward do you support reinstating the fee for the Nuclear Waste Fund?

**ANSWER.**

Under its statutory authorities, the NRC's role associated with Yucca Mountain is that of licensing and oversight to ensure adequate protection of public health and safety and to promote the common defense and security. As such, the NRC has no role regarding reinstatement of the fee.

**QUESTION 55.** Do you believe that nuclear waste as a liability associated with it that should be quantified? Can you estimate what the liability of the existing nuclear waste stockpile might be?

ANSWER.

Under its statutory authorities, the NRC's role associated with nuclear waste is that of licensing to ensure adequate protection of public health and safety and to promote the common defense and security. As such, the Commission has no jurisdiction regarding this matter.

**Senate Environment and Public Works Committee**  
**Hearing entitled, “Hearing on the Nominations of Kristine Svinicki (Reappointment), Annie Caputo and David Wright to be Members of the U.S. Nuclear Regulatory Commission, and the Nomination of Susan Bodine to be Assistant Administrator of the Office of Enforcement and Compliance Assurance of the U.S. Environmental Protection Agency.”**

**Tuesday, June 13, 2017**

**Questions for the Record for Annie Caputo**

**Ranking Member Carper:**

1. It is very important to me that the NRC continues to strive for a culture of safety and continues to be independent in its decision-making. If confirmed, what steps would you take to ensure this culture of safety environment continues?

ANSWER: I agree with you that a strong safety culture is important. Critically, from my observations, I believe the NRC staff is committed to fulfilling the agency’s important safety and security mission, an important basis for agency safety culture. Beyond this, I understand the NRC has several programs in place to support raising differing views, without fear of retribution or retaliation, which can help nurture a strong safety culture. If confirmed, I will examine ongoing efforts to promote safety culture and look for opportunities to strengthen it further.

2. What skills do you bring to the Commission that will enhance the NRC’s ability to focus on safety?

ANSWER: My degree in nuclear engineering gives me a foundational understanding of nuclear technologies and nuclear materials that are subject to NRC regulation. My industry experience inculcated in me a firm belief that safety and security must always come first. My ten years of experience as congressional staff supporting Members’ oversight of the NRC has instilled in me a deep respect for the NRC’s regulatory processes and the Commission’s policy, rulemaking, and adjudicatory responsibilities. If confirmed, I believe these educational and work life experiences have well prepared me to support the NRC’s statutory mission to protect public health and safety and the common defense and security.

3. At one time, the NRC was rated the best place to work in the federal government. Now, it is rated 12th for mid-size agencies. What will you do to boost morale for the NRC workforce?

ANSWER: I will personally maintain and promote with the staff a clear focus on safety and security, and carrying out the NRC’s mission of protecting public health and safety and the environment. Embracing and sharing an important mission like the NRC’s is keystone upon which to build employee morale. Beyond that, I believe the agency should examine, to the extent it does not already do so, the findings of the study that ranked best places to work in the government and take action in the areas of weakness that were identified.

4. During the question and answer portion of your nomination hearing, you mentioned concerns about the NRC budget. It is my understanding that the NRC is now looking at possible

layoffs this summer and there is not much more fat to trim from the NRC's budget. As more reactors start the decommissioning process, that means less money coming into the NRC, what will you do to ensure the NRC has the appropriate funds to recruit the best people and is able keep up with the evolving workload?

ANSWER: With the nuclear industry undergoing significant change, it remains a challenge to ensure the NRC is appropriately resourced with the right skill sets to manage shifts in the nature of its existing and anticipated workload. If confirmed, I will work with my fellow Commissioners to develop annual agency budget requests that fully support taking the requisite actions necessary to fulfill the NRC's safety and security mission.

**Senator Markey:**  
**Force-on-force inspections**

The 2005 Energy Policy Act includes a provision, which I authored, that mandates that the NRC conduct security inspections at U.S. nuclear power plants. These inspections must include force-on-force exercises, where a mock adversary force conducts a simulated attack on a power plant to probe potential gaps in the plant's security.

These exercises allow the NRC to ensure that nuclear power plants are adequately protected against terrorists or other bad actors. The alternative – of having plant operators run their own exercises – would not only violate the law, but it would also create a clear conflict of interest, and undermine public safety.

In the past, the nuclear industry lobbied the NRC to get rid of its force-on-force exercises in favor of exercises conducted by power plant operators. In effect, this would have nuclear power plant operators inspect themselves, in violation of the law.

5. Do you support security evaluations of nuclear power plants that are conducted by the Nuclear Regulatory Commission, and not by licensees?

ANSWER: I understand that Section 170D of the Atomic Energy Act, as amended by the Energy Policy Act, requires the NRC to conduct triennial security evaluations at facilities designated by the Commission, which must include a force-on-force (FOF) exercise that simulates security threats in accordance the applicable design basis threat. If confirmed, this is an issue on which I will engage the NRC staff because of its importance to national security and public health and safety.

**Safety and security exemptions**

When Entergy announced its intention to cease operations at the Pilgrim Nuclear Power Station, the Nuclear Regulatory Commission promised that the closure would “not relieve [Entergy] of the responsibility of running that plant as safely as possible until the end of its life.”

But in the last several months, the NRC has broken that promise by providing Pilgrim with exemptions from critical safety upgrades.

After the Fukushima nuclear disaster in 2011, the Fukushima Near-Term Task Force recommended a series of safety upgrade for America's nuclear fleet. The NRC opted to accept these recommendations, and apply them to reactors of the same design as Fukushima, like Pilgrim.

Among the critical safety upgrades were the requirement to reevaluate and address the risk of earthquakes and floods. The other critical safety upgrade was to install hardened containment vents capable of operating under severe accident conditions. These are meant to prevent the release of radioactivity in the event of a terrorist attack or severe accident.

But instead of requiring Entergy to carry out these commonsense safety upgrades, the NRC provided Pilgrim with exemptions.

6. Do you believe that providing exemptions from NRC safety regulations to U.S. nuclear plants increases public confidence in the safe operation of those plants?

ANSWER: I understand that the NRC has a process allowing power reactor licensees to apply for an exemption from an NRC regulation. I understand that the NRC staff may grant such exemptions on a case-by-case basis if special circumstances are present and that granting the exemption will not present an undue risk to the public health and safety and that it is consistent with the common defense and security. If confirmed, I will review this issue with the NRC staff.

7. Do you support the NRC granting exemptions to nuclear plants that have announced their intention to shut down operations?

ANSWER: I understand that the NRC has an established process, and that the NRC staff may grant such exemptions on a case-by-case basis after performing a detailed technical safety analysis and determining that special circumstances are present and that granting the exemption will not present an undue risk to the public health and safety and that it is consistent with the common defense and security. If confirmed, I will review this issue with the NRC staff and closely monitor the status and progress of the agency's ongoing rulemaking efforts to improve the regulatory process for power reactors transitioning to decommissioning status.

### **Emergency response at decommissioned reactors**

The recent National Academies of Sciences report on lessons learned from the Fukushima nuclear disaster noted that the risk of a spent nuclear fuel fire may actually rise at a decommissioned nuclear plant, because "the pool may be filled to near capacity and some plant safety systems may be inoperable." Yet the Commission has made it a habit of providing exemptions to decommissioned reactors from emergency response and security regulations. Exempting these plants from NRC rules wholesale permits the nuclear industry to lower the safety margin at decommissioned reactors, which continue to have dangerous spent nuclear fuel on site.

8. Do you agree that the danger of accidents at spent-fuel pools at decommissioned reactors warrants the application of all emergency response and security regulations that are designed to protect against spent fuel fires?

ANSWER: I understand that the NRC staff has performed and published a number of studies and analyses on the topic of accident risk at spent fuel pools. The Commission has also required enhanced mitigation strategy capabilities through orders issued after the events of Fukushima. I understand that the staff considers such information when issuing exemptions from certain emergency preparedness and security requirements and making the required finding that such exemptions will not present an undue risk to the public health and safety and the common defense and security. If confirmed, I will review this issue with the NRC staff, and closely monitor the status and progress of the agency's ongoing rulemaking efforts to improve the regulatory process for power reactors transitioning to decommissioning status.

### Spent fuel fires

In June 2016, I wrote to the NRC to urge the Commission to re-examine and address the risk to public safety posed by overcrowded spent-fuel pools at commercial reactors, in light of two reports that identified serious gaps in the NRC's previous analysis. A fire in a densely-packed spent-fuel pool could result in health and economic consequences comparable to those caused by an accident at an operating reactor, including the displacement of millions of people and untold economic damage. These risks could be much reduced by transferring spent fuel to dry casks, which are more resilient against accidents or attacks.

9. The National Academy of Sciences (NAS) report, *Lessons Learned from the Fukushima Nuclear Accident for Improving Safety and Security of U.S. Nuclear Plants*, recommends that the NRC "perform a spent fuel storage risk assessment to elucidate the risks and potential benefits of expedited transfer of spent fuel from pools to dry casks." Do you support carrying out this recommendation? If not, why not?

ANSWER: I understand that the NRC staff recently evaluated this specific NAS recommendation and concluded in a public paper to the Commission that the various analyses already performed or sponsored by the NRC staff were sufficient to support regulatory decisions on the safety and security of spent fuel pools. In that assessment the NRC staff also stated that it is continuing to gather regulatory and technical insights on the security of dry cask storage and is continuing to cooperate with other Federal agencies and international bodies to assess potential security threats and take action, if appropriate. If confirmed, I will engage the staff on the continuation of these efforts.

10. The NAS report recommended that the NRC "strengthen their capabilities for identifying, evaluating, and managing the risks from terrorist attacks," and that the NRC's spent fuel storage risk assessment "should address accident and sabotage risks." Do you agree with the NAS recommendation that the NRC must fully account for the risk of terrorism and sabotage in its re-assessment of spent-fuel risks? If not, why not?

ANSWER: I understand that the NRC staff also evaluated this NAS recommendation and concluded that existing NRC security requirements and the NRC's continuous interactions with other Federal agencies to assess potential threats and take action, if appropriate, sufficiently addresses security-related risks to nuclear power plants, including terrorism and sabotage. The staff also stated it would continue to work with other Federal agencies, licensees, and other stakeholders to improve its risk assessment techniques and risk management in maintaining security at nuclear power plants. Because of its importance to national security and public health and safety, I will engage the staff on the continuation of these efforts, if confirmed.

11. What steps, if any, will you support to strengthen the NRC's capabilities for identifying, evaluating, and managing the risk of terrorist attacks on nuclear facilities, including spent-fuel storage sites?

ANSWER: I understand that the NRC continuously evaluates the potential risk posed by terrorism to NRC-licensed facilities, including spent fuel storage sites, and that if the NRC determines that new information requires additional protection at NRC-licensed facilities, the NRC will impose additional security requirements at those sites. If confirmed, I will give this vital task of protecting national security and the public health and safety the attention it deserves.

12. As the Fukushima disaster demonstrated, a major release of radioactivity at a nuclear plant could have significant societal effects. As such, to fully capture spent-fuel storage risks, the NAS report recommended that the NRC's analysis "[c]onsider societal, economic, and health consequences" of a spent-fuel fire, as well as the direct risks of radioactive release. Do you agree with this recommendation? If not, why not?

ANSWER: I understand that the NRC gives consideration to societal, economic, and health consequences of hypothetical severe accidents as part of its regulatory analysis process, and that there is an ongoing NRC effort to update its regulatory analysis guidelines for the consideration of economic consequences. If confirmed, I will review this topic with the NRC staff.

13. According to the NAS report, the NRC "has not carried out an independent examination of surveillance and security measures for protecting stored spent fuel," as recommended by the NAS's 2006 report. As such, the 2016 NAS report recommended that the NRC fulfill this recommendation, and that the NRC's analysis "should include an examination of the effectiveness of [the NRC's] programs for mitigating insider threats." Do you support carrying out an independent examination, as recommended by both NAS studies? If not, why not?

ANSWER: I understand that the NRC has conducted numerous studies over the years to assess potential risks from terrorist attacks, and that the agency continuously evaluates the risk posed by terrorism to NRC-licensed facilities, including spent fuel storage sites. I also understand that the NRC has an insider threat program. If confirmed, I will give this vital task of protecting national security and the public health and safety the attention it deserves.

14. According to an article in the May 26 issue of *Science* magazine, the NRC's previous assessment of spent-fuel risks ignored the potential damage from a spent fuel fire beyond 50 miles of a plant, despite the fact that a significant portion of the radiation exposure would occur beyond that radius. Failing to account for this factor led the NRC to underestimate the destruction of a spent fuel fire. Do you support inclusion of contamination and other effects beyond 50 miles in the NRC's assessment of spent fuel fire risks?

ANSWER: I understand that the NRC staff has previously documented its analysis of spent fuel risks resulting from the potential damage from a spent fuel fire in COMSECY-13-0030, and that as part of this analysis the NRC staff did perform sensitivity analyses that extended beyond 50 miles. I understand that the NRC staff concluded from this analysis that regulatory changes were not appropriate. If confirmed, I will familiarize myself with their conclusions and engage the NRC staff on this topic.

15. According to the *Science* magazine article, the NRC's previous analysis also assumed that, in the event of a spent fuel fire, contaminated areas could be effectively cleaned up within a one year timeframe, despite evidence from both the Chernobyl and Fukushima accidents. Do you support revising that assumption in any re-assessment by the Commission of spent-fuel risks?

ANSWER: I understand that the NRC staff has previously documented its analysis of spent fuel risks resulting from the potential damage from a spent fuel fire in COMSECY-13-0030. I understand that the NRC staff concluded from this analysis that regulatory changes were not appropriate. If confirmed, I will engage the NRC staff on this topic.

16. According to the recent NAS study, under NRC rules, if the risk of prompt and cancer fatalities in the vicinity of a nuclear accident falls below a certain threshold, the NRC is not required to undertake a cost-benefit analysis of strategies for mitigating that risk. As a result of this rule, even though a spent-fuel fire could displace millions of people and result in trillions in economic damage, the NRC would not be required to evaluate the costs and benefits of strategies to mitigate such an event because it would not necessarily produce a significantly higher risk of fatalities in the immediate vicinity of the plant. To address this obvious deficiency, the NAS study cites experts who have suggested that the NRC should amend its rules by setting a limit on the likelihood that a large number of people would be displaced for a long-term period following a release of radioactive fall-out. Do you support implementing such a rule?

ANSWER: I am unfamiliar with the details of this issue. If confirmed, I will engage with the NRC staff on this topic.

### **Senator Sanders:**

#### **Nuclear decommissioning regulations**

17. As you know, the Vermont Yankee Nuclear Power Station is in the process of decommissioning. The Nuclear Regulatory Commission (NRC) requested comments on a draft

regulatory basis ending this month to support a rulemaking that would amend NRC's regulations for the decommissioning of nuclear power reactors. The NRC's goals in amending these regulations would be to provide for an efficient decommissioning process; reduce the need for exemptions from existing regulations; address other decommissioning issues deemed relevant by the NRC staff; and support the principles of good regulation, including openness, clarity, and reliability.

If confirmed, will you commit to supporting the following decommissioning requirements for the decommissioning rulemaking? If not, why?

- a. The enhancement of community involvement by requiring licensees of decommissioning reactors to include state and local officials' input into licensees' decommissioning plans;
- b. that decommissioning funds are used strictly for statutorily-authorized purposes;
- c. that spent nuclear fuel be removed from wet storage and placed into safer dry cask storage as quickly as possible;
- d. that the site of the plant is rapidly returned to beneficial use instead of decades after the plant ceases operations, and that licensees maintain or obtain the financial resources necessary to do so; and
- e. that all emergency preparedness and response, and security resources and licensing requirements, remain in place until all the spent nuclear fuel is placed into safer dry cask storage or removed from the site.

ANSWER: I understand that the NRC's decommissioning rulemaking is currently ongoing and still in the early stages of the process. I understand that the NRC has published draft documents including preliminary options and recommendations for public comment associated with this rulemaking. If confirmed, I will give the various issues presented in your question full and impartial consideration as I review the staff's progress and conclusions as this rulemaking progresses during the course of my term.

18. What do you believe should be the process for reviewing and processing public comments in the rulemaking and other formal proceedings? How should public comments be weighed by the Commission against comments from the industry?

ANSWER: I understand that the Administrative Procedure Act governs the process by which agencies solicit and respond to public comments in rulemaking proceedings. I also understand that the NRC has various internal policies and guidance relating to soliciting and responding to public comments. I understand that the NRC, as an independent agency, must consider and evaluate information it receives fairly and objectively regardless of the affiliation of the submitter.

19. How should the NRC educate the public about the existence and meaning of the ongoing decommissioning rulemaking process? What should be NRC's plan for community outreach for the remainder of this decommissioning rulemaking process?

ANSWER: I understand that the NRC uses various processes to educate and engage the public about its rulemaking activities, including the decommissioning rulemaking. For example, as with the decommissioning rule, the NRC can issue an Advance Notice of Proposed Rulemaking to obtain and consider views from the public at the initial stage of the rulemaking process. I understand that the NRC has also held public meetings to raise awareness of this rulemaking and facilitate better public understanding. I understand that the NRC also has an Office of Public Affairs which routinely publishes press releases and performs other outreach to members of the public and provide updates on ongoing regulatory activities, including the decommissioning rulemaking. In all, I understand the importance of understandable and transparent communication with the public and, if confirmed, I will continue these efforts.

20. Should NRC plan public field meetings to gather comments or testimony from communities where nuclear plants are decommissioning now, or will be soon? If not, why?

ANSWER: I understand that the NRC staff already does hold public meetings in the vicinity of a decommissioning facility in the early stages of the decommissioning process to discuss the licensee's planning, schedule, cost, and environmental impact information.

21. What is the justification for the NRC to continuously waive its own regulations, especially those pertaining to the decommissioning trust fund, even though it is working to create new decommissioning rules?

ANSWER: I understand that the NRC has an established process, and that the NRC staff may grant such exemptions on a case-by-case basis after performing a detailed technical safety analysis and determining that special circumstances are present and that granting the exemption will not present an undue risk to the public health and safety and that it is consistent with the common defense and security. If confirmed, I will review this issue with the NRC staff and closely monitor the status and progress of the agency's ongoing rulemaking efforts to improve the regulatory process for power reactors transitioning to decommissioning status.

22. What justification is there for the NRC to approve withdrawals from Vermont Yankee's Decommissioning Trust Fund for spent fuel management when NRC's regulations expressly prohibit such use? (10 C.F.R. § 50.75 at FN 1.)

ANSWER: I am unfamiliar with the details of this issue. If confirmed, I will review the issue with the NRC staff.

23. Former NRC Chair Allison Macfarlane authored a paper in 2003 along with other experts that concluded that dry cask storage offers compelling advantages over wet pool storage: it is safer and it is less prone to failure. They recommended that spent fuel should be transferred from wet pools to dry cask storage within five years of discharge to reduce the risk of fire and subsequent radioactive contamination of air and land.

Do you have a position on dry cask versus wet pool storage? If confirmed, will you commit to supporting more studies of this issue?

ANSWER: The NRC has concluded that spent fuel storage in pools and dry casks are both safe. If confirmed, I will support examination of any new information on this topic.

### **Working with state and local government regulators**

24. State regulatory officials from Vermont have raised concerns that the NRC is less likely to consider commentary received from state and local governments on reactor license change requests, and NRC rulemaking and regulatory guidance efforts, than commentary from nuclear power plant operators (e.g. Entergy, Exelon and First Energy) and nuclear power industry organizations such as the Nuclear Energy Institute (NEI). If confirmed, what steps would you take to assure that commentary and concerns expressed by state and local governments, or other nuclear power plant stakeholders, are given consideration equal to that already enjoyed by nuclear power plant operators and their supporters?

ANSWER: I understand that the Administrative Procedure Act governs the process by which agencies solicit and respond to public comments in rulemaking proceedings. I also understand that the NRC has various internal policies and guidance relating to soliciting and responding to public comments. If confirmed, I will ensure that the NRC, as an independent agency, consider and evaluate information it receives fairly, transparently, and objectively, regardless of the affiliation of the submitter.

25. To date, nuclear power plants that have permanently shut down have been permitted to eliminate their offsite Emergency Planning Zones (EPZs) roughly 15 to 20 months after cessation of power generation. The risk of a spent fuel fire resulting from a significant loss of spent fuel pool water inventory is greatly reduced, but a reduction in risk is not an elimination of risk. A reduced risk of a spent fuel fire still requires a significant offsite emergency response that requires drills or exercises to demonstrate proficiency in response and funding to maintain essential emergency response equipment and staff. If confirmed, will you support maintaining offsite EPZs for permanently shut down nuclear power plants until such time that all spent fuel is removed from onsite spent fuel pools?

ANSWER: I understand that the NRC staff has performed and published a number of studies and analyses on the topic of accident risk at spent fuel pools (such as NUREG-1738: "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," NUREG-2161: "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor," COMSECY-13-0030: "Staff Evaluation and Recommendation for Japan Lessons Learned Tier 3 Issue on Expedited Transfer of Spent Fuel,"), and has also required enhanced mitigation strategy capabilities through orders issued after the events of Fukushima. I understand that the NRC staff considers such information when it evaluates the issuance of exemptions from certain emergency preparedness requirements and makes the required finding that the exemption will not present an undue risk to the public health and safety. If confirmed, I will review this issue the NRC staff, and closely monitor the status and progress of the agency's ongoing rulemaking efforts to improve the regulatory setting for power reactors transitioning to decommissioning.

26. When NRC staff respond to concerns raised by state or local government officials, or individual concerned citizens, they rely heavily on references to voluminous regulatory documents which are difficult to follow, or use jargon that only makes sense to other NRC staff. If confirmed, what actions would you consider taking to facilitate clear communication by NRC officials with lay members of the public?

ANSWER: I understand that the NRC is committed to using clear, plain language in its communications with members of the public, and that, per the Plain Writing Act of 2010, the agency has internal plain-writing guidance and a Plain Writing Action Plan, and publishes annual reports on its implementation of these requirements. I understand the importance of the quality and clarity of communications with NRC stakeholders to ensure they are adequately informed of the agency's regulatory, licensing, and oversight activities. If confirmed, I will support the agency's continued efforts in this area.

27. One significant source of frustration for state and local governments, and individuals who are following nuclear power plant decommissioning efforts, is that the process of complete decommissioning and site restoration is under the jurisdiction of multiple federal agencies in addition to the NRC, such as the Environmental Protection Agency, the Department of Energy, the Department of Transportation, and the Department of Homeland Security, just to name a few. If confirmed, what steps would you take to assure that the scope of regulatory authority of all federal agencies with jurisdiction is clear to all stakeholders?

ANSWER: I understand that the NRC currently has various Memoranda of Understanding with these federal agencies with respect to jurisdictional responsibilities and the overall regulatory framework of decommissioning and site restoration. If confirmed, I will work with the NRC staff, such as the Office of Public Affairs, to ensure that these responsibilities are communicated clearly with interested stakeholders and ensure that the public is adequately informed and engaged on these matters.

### **Future of nuclear power**

28. What do you believe is the future of nuclear power in this country?

ANSWER: I expect nuclear power will continue to be an element of the nation's diverse electric generation portfolio but at a somewhat diminished percentage for the next several decades.

29. If confirmed, what role do you believe you should play—if any—as Commissioner in supporting the nuclear power industry?

ANSWER: The NRC's only role is to ensure that the design, construction, operation, and decommissioning of commercial nuclear power plants satisfy the agency's regulatory standards, in a manner that is protective of public health and safety and the common defense and security. If confirmed, I would have no other role.

30. According to recent Energy Information Agency estimates, the generating capacity from nuclear power will drop from 20 percent to 11 percent by 2050. If confirmed, how will you ensure safety during this time of mass decommissioning?

ANSWER: I understand that the NRC oversees the safety and security of reactors during decommissioning and currently has comprehensive regulations to ensure their safety and security during its decommissioning process. This regulatory framework includes safety, environmental, and financial reviews so that the NRC staff can assess decommissioning activities in areas such as financial assurance, training and qualification of licensee staff, decommissioning methods, and clean up criteria. I understand this oversight also includes independent NRC review and monitoring during major decommissioning activities and NRC verification of the site's final radiological conditions. If confirmed, I will work with the staff to ensure that the NRC's decommissioning regulatory framework continues to preserve the safety and security of these sites, even during a time of increasing decommissioning, and I will closely monitor the status and progress of the agency's ongoing rulemaking efforts in this area. Additionally, if confirmed, I will work with the Commission and with Congress to ensure that, if these EIA estimates are correct, the agency has adequate resources to respond to the increasing numbers of nuclear power plants entering decommissioning.

31. Most of the plants currently being decommissioned across the U.S. are doing so because they are not economically competitive. Some have proposed easing safety and other regulatory burdens to help the economic viability of the nuclear fleet. If regulations on existing and new power plants are decreased, how will you ensure the safety of our nuclear fleet?

ANSWER: I understand that the NRC has a statutory responsibility to ensure there is reasonable assurance of adequate protection of public health and safety and the common defense and security under the Atomic Energy Act of 1954 and that the NRC does not consider cost when determining what is necessary for adequate protection. If confirmed, I will ensure that, to the extent the agency revises any regulations for new or existing power reactors, compliance with those regulations will continue to ensure reasonable assurance of adequate protection.

### **Advanced nuclear reactors**

32. If confirmed, how will you ensure the public safety of next-generation nuclear reactors that implement advanced technologies?

ANSWER: I understand that in 2008 the Commission published a Policy Statement on the Regulation of Advanced Reactors, which established an expectation that advanced reactors will

provide enhanced margins of safety and/or use simplified, inherent, passive, or other innovative means to accomplish safety and security functions. If confirmed, I will ensure that this policy is implemented and that the NRC staff is giving the appropriate consideration to the safety and security of the design of advanced reactors and the development of a regulatory framework for advanced reactor designs.

33. How will the potential development of advanced nuclear technologies affect the problems NRC is currently confronting in storing spent nuclear fuel long-term?

ANSWER: I understand that advanced nuclear technologies propose to use various fuel forms that will generate and potentially consume high-level radioactive waste. If confirmed, I will ensure that the NRC engages with necessary stakeholders including the Department of Energy, advanced reactor designers, industry organizations, international organizations, and the public, as the agency develops and implements any plans for the possible regulation of advanced reactor designs and related fuel cycle facilities, including those associated with storage of spent nuclear fuel.

34. Currently the U.S. has no permanent storage for spent nuclear fuel. Where do you anticipate that spent nuclear fuel from next-generation nuclear reactors will be stored?

ANSWER: In keeping with its mission to protect the public health and safety and the common defense and security, the NRC must ensure that spent fuel is stored safely. In the event that the storage of spent fuel from next-generation reactors raises issues not previously anticipated, I will engage with the NRC staff to develop a full understanding and resolution of those issues.

### **Nuclear plant safety**

The March 2011 Fukushima nuclear accident prompted the NRC to review its own regulations. The Commission's Fukushima Task Force, consisting of NRC experts with 135 years of nuclear regulatory expertise among them, made a range of key recommendations for improving nuclear plant safety. The final report included 12 recommendations ranging from requirements to upgrade seismic and flood protections to protections against the long power outages that were the ultimate cause of the Japanese meltdowns. They also concluded that all of the recommendations were necessary for the "adequate protection" of nuclear power plants.

Despite the repeated urging of its own experts, the Commission has so far refused to make these recommendations mandatory. What steps will you take to ensure that the Commission revisits this decision and does, in fact, adopt the Task Force's safety recommendations as mandatory?

ANSWER: I understand that following the accident at Fukushima, the NRC assessed the operability of the US nuclear fleet and determined that it remained safe for the nuclear fleet to continue operations. The NRC also chartered a Near-Term Task Force (NTTF) to conduct a review of NRC requirements, programs, and processes and recommend any improvements to the NRC's regulatory system. I understand that the Commission issued orders based on the

recommendations of the NTTF to implement the most significant safety recommendations and that implementation of these safety enhancements are substantially completed. I understand the agency is currently engaged in a rulemaking effort that would make these and other NTTF recommendations required for all current and future nuclear power plants. If confirmed, I would continue to engage the NRC staff on this important topic of post-Fukushima actions.

36. A paper published in *Science* last month by nuclear experts from the Union of Concerned Scientists and Princeton University argued that the NRC places the U.S. at risk of disasters like Fukushima because of problems in its approach to assessing the risks and benefits of safety improvements. The authors suggest that NRC should reform its risk assessments in the following ways (see below). Do you concur that these corrections to current NRC risk assessments are needed? If not, why? If so, how will you address these issues as a Commissioner, if confirmed?

- a. Take into account the possibility of a terrorist attack in regulatory decisions such as the one on whether or not to require the nuclear utilities to remove spent fuel to dry cask storage after 5 years.
- b. Take into account accident consequences beyond 50 miles of the site.
- c. Make assumptions concerning population relocation, and therefore property losses, after a nuclear accident consistent with the EPA's guidance concerning dose levels.
- d. Make realistic assumptions concerning the efficacy and speed of decontamination actions.
- e. Update the NRC's assumption concerning the value of a life lost to radiation-induced cancer by a factor of 2.5, as recommended by the NRC staff.

ANSWER: I understand that the NRC staff has, in various studies and regulatory analyses, provided the Commission with its assessment of several of these issues. For example, in COMSECY-13-0030, I understand the NRC documented its analysis of spent fuel risks resulting from the potential damage from a spent fuel fire, which included a sensitivity analysis extending beyond 50 miles. In another example, I understand the staff has recently provided recommendation to the Commission in a public paper to update the NRC's guidance on the "Dollar Per Person-Rem Conversion Factor Policy," which is the agency's monetary valuation of the cancer mortality risk of radiation exposure. Additionally, I understand the NRC staff continuously monitors and assesses threat conditions and plant security associated with terrorist attacks, interacting and coordinating with other federal agencies, and that the NRC is committed to take appropriate actions to address this changing threat environments should new information ever indicate new risks to plants or spent fuel. If confirmed, I will engage with the NRC staff on these issues on an ongoing basis.

37. A February 2017 report by Union of Concerned Scientists stated, "Just as nuclear plant owners have downplayed and dismissed clear and present signs about safety culture problems at their plants, the data suggest that the NRC's management is just as dismissive of indications that it has a poor safety culture." Are you concerned that staff at nuclear power plants and the NRC are reluctant to report safety problems because of the lack of trust between workforce and

management? If so, how can NRC address the lack of a nuclear safety culture, and lessen risks to public and environmental safety? If not, what evidence do you have that NRC management maintains a robust safety culture?

ANSWER: I understand that the NRC has policy statement which describes how it assesses a licensee's safety conscious work environment (SCWE) where employees are encouraged to raise safety concerns without fear of retaliation or retribution and where those concerns are promptly reviewed and resolved accordingly. I understand the NRC assesses licensees' SCWE and takes action when necessary through tools such as allegations, inspections, chilling effect letters, and orders. I also understand that internally, the NRC is committed to fostering an environment where the staff is free to raise concerns and offer differing views without fear of reprisal. If confirmed, I will continue to engage the NRC staff in these important ongoing efforts, both externally and internally, to promote the importance of a robust safety culture.

### **Yucca Mountain**

38. NRC's Office of Nuclear Material Safety and Safeguards (NMSS) is responsible for regulating activities which provide for the safe and secure production of nuclear fuel used in commercial nuclear reactors; the safe storage, transportation and disposal of high-level radioactive waste and spent nuclear fuel; and the transportation of radioactive materials regulated under the Atomic Energy Act. The United States is facing a significant long-term problem in its disposal of nuclear waste. What do you envision as a potential solution, and what role should NRC play?

ANSWER: National policy regarding solutions for the disposal of spent nuclear fuel are set by Congress and the President. In its regulatory role as an independent federal agency, the NRC must evaluate the safe and secure operation of high-level waste storage through its licensing and regulatory actions, as well as its oversight responsibility of licensees, consistent with the statutory direction set by the Congress and the President.

39. President Trump's FY18 budget proposal would revive the approval process for Yucca Mountain nuclear waste site. NRC's role in approving the Yucca Mountain site has been to assess DOE's license application to consider whether the proposed facility meets its regulatory requirements for geologic disposal of the waste. The NRC process also includes conducting a Safety Evaluation Report and adjudicatory hearings before the Atomic Safety and Licensing Board. Adjudicatory hearings for Yucca Mountain, which must be completed before a licensing decision can be made, remain suspended. If confirmed, will you ensure robust public comment and involvement in any decision on a potential solution to this country's significant long-term problem of nuclear waste disposal?

ANSWER: Yes.

### **Potassium iodide for thyroid protection**

40. Within the past two weeks, doctors at Pennsylvania State University published a paper analyzing 44 cases of thyroid cancer in the vicinity of the Three Mile Island nuclear plant and found convincing evidence that they showed signs of exposure to radiation. In 2002, as part of the response to the 9/11 disaster, Congress authorized an expansion from 10 to 20 miles of the radius within which the drug potassium iodide would be distributed. At the time, the NRC fought that expansion, and under President Bush, the law was not implemented. If confirmed, will you commit to a re-evaluation of the need for greater availability of potassium iodide in view of increased evidence of the sensitivity of the thyroid gland to the carcinogenic effects of radiation?

ANSWER: If confirmed I will engage with the NRC staff on this issue and any review or assessments the staff makes of this study.

### **Leadership**

41. The NRC used to be considered one of the top federal agencies in workplace satisfaction. Yet, according to index scores from the U.S. Office of Personnel Management's Federal Employee Viewpoint Survey, employee satisfaction at NRC is the worst since 2005 with declines of 3.5 points in just the last year (2015 to 2016). This drop represents one of the steepest declines among agencies of its size. Moreover, scores on leadership are consistently down across all categories, including senior leadership, empowerment, and fairness. If confirmed, what will you do as Commissioner to address these declines?

ANSWER: If confirmed, I will personally maintain and promote with the staff a clear focus on safety and security, and carrying out the NRC's mission of protecting public health and the environment. Embracing and sharing an important mission like the NRC's is keystone upon which to build employee morale. I understand the NRC is implementing an action plan that focuses on "fostering a greater climate of trust at the NRC" with the goals of strengthening the positive environment for raising concerns; promoting a culture of fairness, empowerment and respect across the agency; and establishing clear expectations and accountability for NRC leaders. Beyond that, I believe the agency should examine, to the extent it does not already do so, the findings of the study that ranked best places to work in the government and take action in the areas of weakness that were identified. If confirmed, I would support these efforts.

### **Independence**

42. The first of the Nuclear Regulatory Commission's five Principles of Good Regulation is "Independence." What does that principle mean to you?

The NRC's Principle of "Independence" states:

*"Nothing but the highest possible standards of ethical performance and professionalism should influence regulation. However, independence does not imply isolation. All available facts and opinions must be sought openly from licensees and other interested members of the public. The many and possibly conflicting public interests involved must be considered. Final decisions must*

*be based on objective, unbiased assessments of all information, and must be documented with reasons explicitly stated."*

I strongly agree with this Principle and, if confirmed, I will personally adhere to it and promote the importance of independence in my interactions with NRC staff.

43. Would you agree that the Nuclear Regulatory Commission (NRC) should not allow political meddling from Congress, other parts of the executive branch, or industry to interfere with the NRC's independent decision-making processes?

ANSWER: Yes.

44. Do you commit to zealously guard the independence of the NRC and oppose any efforts to undermine it?

ANSWER: Yes.

### **Conflicts of interest**

As a former executive for Exelon, the nation's largest nuclear power plant operator, you have considerable ties to the nuclear industry. If confirmed, will you commit to recusing yourself on any matters that Exelon might bring before the NRC?

ANSWER: If confirmed, I will consult with the designated ethics official at the NRC regarding the need to recuse myself from any particular matter in order to comply with the Ethics in Government Act of 1978, Office of Government Ethics regulations, and Executive Order 13770.

## **Organizational contacts**

45. Please list all conference panels, meetings, public rallies, or other public events that you have attended at which nuclear energy or nuclear waste issues were discussed.

ANSWER: For the 12 years working as a member of the professional staff of either the Senate Environment and Public Works Committee or the House Energy and Commerce Committee, I have attended many meetings and participated in many panels in the performance of my duties. Generally, the purpose of my attendance was to discuss the agenda of those committees with respect to nuclear issues. I attended those meeting on behalf of Senator John Barrasso, Senator James Inhofe, Congressman Joe Barton, or Congressman Fred Upton.

Prior to my Congressional career, I was Congressional Affairs Manager for Exelon. In that role, I attended conferences and meetings on behalf of Exelon. I did not keep records of such conferences and meetings during that time period. However, I can recall attending conferences and meetings with the following organizations:

- American Nuclear Society
- Department of Commerce
- Department of Energy
- Department of State
- Edison Electric Institute
- Electric Power Supply Corporation
- Energy Information Administration
- LES
- National Academies of Science
- National Association of Regulatory Utility Commissioners
- National Energy Resources Organization
- Nuclear Energy Institute
- U.S. Nuclear Infrastructure Council

I don't recall attending conferences or meetings during my time as a consultant for Areva, Inc., in 2007.

If confirmed, in meeting my obligations as a Commissioner I would seek to fully understand concerns raised by the broad spectrum of organizations and individuals, regardless of their affiliation, in my consideration of matters that come before the Commission, consistent with the NRC's Principles of Good Regulation and specifically the principle of "Independence."

47. Please provide copies (written, audio, or video) of all speeches you have made concerning nuclear energy, nuclear safety, spent nuclear fuel, Yucca Mountain, nuclear waste, or other issues of relevance to the work of the NRC.

ANSWER: During my 12 years as a member of the professional staff of either the Senate Environment and Public Works Committee or the House Energy and Commerce Committee, I have given speeches and participated in panels in the performance of my duties. Generally, the

purpose of my attendance was to discuss the agenda of those committees with respect to nuclear issues. Such speaking engagements would have been on behalf of Senator John Barrasso, Senator James Inhofe, Congressman Joe Barton, or Congressman Fred Upton.

To the best of my knowledge and recollection, the only speech meeting this description that I gave during my employment with Exelon or Areva, Inc., was "Nuclear Inside the Beltway" presented to the American Nuclear Society's Western Regional Student Conference in 1999 (attached).

48. Please provide a list of all organizations—with an interest in nuclear energy, nuclear waste, nuclear safety, or related matters—of which you are, or have been a member?

ANSWER: To the best of my knowledge and recollection, the only organizations with an interest in nuclear energy, nuclear safety, or related matters that I have been a member of is the American Nuclear Society and the North American Young Generation in Nuclear. I am no longer a member of either organization with my memberships having lapsed over two years ago.

49. Have you or any member of your immediate family received funding, either directly or indirectly, from organizations supporting the licensing of Yucca Mountain as a repository for spent nuclear fuel or from organizations supporting the licensing new nuclear reactors? If so, please describe.

ANSWER: I was employed by Exelon from February 10, 1997, until February 11, 2005. I was also a paid consultant to Areva, Inc., for five months in 2007. From February 14, 2005, until January 2, 2007, and since May 30, 2007, I have been employed as a congressional staff member on committees with jurisdiction for oversight of the Nuclear Regulatory Commission.

### **Senator Sullivan**

Earlier this spring the Committee on Environment and Public Works reported S.512, the "Nuclear Energy Innovation and Modernization Act" on a strong bi-partisan vote. The findings and purposes of this bill provide a framework for these questions.

In S.512 the Committee found that one of the "...impediments to the commercialization of advanced nuclear reactors..." is the "... durations associated with applying the existing nuclear regulatory framework to advanced nuclear reactors. We further found that "...license application reviews should be as predictable and efficient as practicable without compromising safety or security." And, that "the existing nuclear regulatory framework and the requirements of that framework have not adapted to advances in scientific understanding or the features and performance characteristics of advanced nuclear reactor designs."

To address these findings S.512 would establish "...a program to develop the expertise and regulatory processes necessary to allow innovation and the commercialization of advanced nuclear reactors". S.512 provides the NRC with ample time to develop that program so, even if the bill were enacted this year, it will not be fully in place for several years.

Assuming that S.512 is enacted, I would like to understand your views with respect to the application of the NRC's current regulatory authority to innovative nuclear technologies during the time between enactment and the establishment of this new program.

50. Do you agree with the general findings of S.512? If not, please explain.

ANSWER: I agree with the findings.

In this interim period, the Commission likely will be confronted with innovative and advanced nuclear technologies, *e.g.* subcritical technologies, which may not fit within the scope of the NRC's current regulations. The Atomic Energy Act vests the NRC with broad authority to determine the scope of its regulatory jurisdiction, including the discretion to issue additional regulations to bring new technologies within the scope of the existing regulatory framework.

51. In the event you encounter such an issue while serving on the NRC, what views will guide how you exercise your discretion with respect to regulation of such new technologies? Will you regulate simply to regulate or will you insist that there be regulation only when it is needed to adequately address public health and safety risks?

ANSWER: Should I encounter such an issue while serving on the NRC, my views would be guided by NRC's Principles of Good Regulation, particularly "Efficiency", "Clarity" and "Reliability". I would also look to recent precedent regarding the licensing of innovative and advanced nuclear technologies, such as the construction permit for the SHINE Medical Technologies, Inc. -- application a first-of-a-kind facility dedicated to medical isotope production.

Nuclear industry activities frequently are subject to regulation by many different federal agencies which often have different perspectives and objectives.

52. If you are presented with a situation in which regulation of a new innovative technology by other agencies appropriately addresses any public health and safety risks presented by that technology, will you insist that the NRC also regulate?

ANSWER: Yes, consistent with NRC's statutory role mandated by Congress as the nation's sole regulatory authority for the licensing and oversight of commercial nuclear technology.

**Senator Whitehouse:**

**NRC Budget**

53. Last year, NRC's budget included a \$5 million request to build up the regulatory infrastructure for improving licensing of advanced reactor concepts. This request was appropriated in this year's Omnibus. Unfortunately, in this year's budget request NRC does not ask for additional funding for their advanced reactor licensing work.

a. Can you discuss what the NRC plans to do with the additional funding for advanced reactor licensing?

b. Why did NRC not ask for additional funding in the President's FY2018 budget to continue its work in this area?

ANSWER: I am not privy to the FY2017 and FY2018 internal budgetary deliberations of the Commission, other than what has been made publicly available in the agency's Congressional Budget Justification. , If confirmed, I will work to ensure that the NRC is adequately funded for its existing and anticipated work relating to advanced reactor licensing.

c. There have been tremendous advances in predictive modeling and simulation capabilities for new nuclear technologies that can yield new insights into new reactor behaviors and accelerate the licensing of new technologies. Will you help direct the NRC staff to embrace and adopt these tools?

ANSWER: Yes, I will.

### **Licensing of Reactors in China**

54. The Chinese currently have 21 new nuclear reactors under construction. The Chinese regulatory system appears to be similar to the new, post-Fukushima Japanese system, where the nuclear regulatory body is housed in the Environment Ministry. Although it appears that the Chinese regulatory systems seems to have similar licensing and regulatory authority to that of the U.S. NRC, their ability to license reactors appears to be more efficient.

a. Can you discuss whether the current regulatory licensing framework at NRC is different than the Chinese licensing system? If so, what are the differences?

b. Can you comment on what may be enabling the Chinese to be able to license 21 new reactors under their framework?

c. Has the NRC looked at a cross comparison between the Chinese licensing process and the U.S. system? If not, would you commit to doing such a comparison?

ANSWER: I am not familiar with the current regulatory licensing framework used by the Chinese nuclear safety and security regulatory body, nor am I aware of a cross comparison between the US and Chinese licensing system. If confirmed, I will engage with the NRC staff on this issue.

### **Nuclear Waste**

55. The NRC budget includes \$30 million from the Nuclear Waste Fund to fund activities for the proposed Yucca Mountain deep geological repository. DOE has been collecting fees since 1983 under the Nuclear Waste Policy Act of 1982 to go into the Nuclear Waste Fund. Until 2010, DOE was collecting around \$750 million a year (nearly \$31 billion in total) into the fund. The fee program was stopped in 2010 after the Obama administration backed away from the planned nuclear fuel repository at Yucca Mountain.

a. If you are confirmed as Commissioner and Congress passes funding for Yucca Mountain licensing do you plan on moving the licensing process forward?

b. If the licensing process for Yucca Mountain moves forward do you support reinstating the fee for the Nuclear Waste Fund?

c. Do you believe that nuclear waste as a liability associated with it that should be quantified? Can you estimate what the liability of the existing nuclear waste stockpile might be?

ANSWER: If confirmed as a Commissioner, I would have an obligation to follow the law and comply with Congressional direction provided in enacted appropriations legislation. Reinstatement of the fee for the Nuclear Waste Fund and quantification of nuclear waste liability are policy matters that would need to be resolved by Congress and the Administration.

**Senate Committee on Environment and Public Works**  
**Hearing entitled, “*Hearing on Nominations*”**  
**March 11, 2020**  
**Questions for the Record for Commissioner Wright**

**Senator Cardin:**

**QUESTION 1.** In recent years, the NRC has launched two initiatives to modernize its regulatory approach and slim down: *Project Aim* and *Transformation*. What is the current progress of the NRC’s efforts to modernize its regulatory approach through programs such as *Project AIM* and *Transformation*?

**ANSWER.**

Project Aim and NRC’s Transformation are complementary efforts. Both have allowed the NRC to improve its ability to adapt through recognizing efficiencies, increasing agility, and modernizing the way it does business.

The NRC established Project AIM to enhance the agency’s ability to plan and execute its mission in a more effective and efficient manner. In 2017, the NRC completed the major deliverables for each of the 19 discrete Project Aim tasks that addressed the NRC’s need to improve efficiency and flexibility to right-size the agency, while retaining employees with the appropriate skills to accomplish its mission and streamline processes.

The agency continues to implement the principles of Project Aim and pursue additional activities that demonstrate the NRC’s continuing commitment to effectiveness, agility, and efficiency. For example, the NRC standardized and centralized support staff functions of NRC headquarters and regional offices and established a common prioritization process to prepare the agency to evaluate emerging work more readily. We have also implemented an enhanced Strategic Workforce Planning process to improve workforce management.

The NRC's Transformation Initiative is focused on assessing how the NRC performs our work and is intended to advance the agency towards the vision of being a modern, risk-informed regulator, while helping to ensure the agency and its staff are in the best position to successfully meet the agency mission in future.

Transformation is occurring across the NRC at all levels of operation and significant progress has been made in the areas of strategic workforce planning and recruitment; use of risk insights in decision-making; mobile technology capabilities; and fostering a culture of innovation.

Recently, new information technology platforms, productivity tools and connectivity solutions were released to help employees work smarter and better interface with external stakeholders and licensees. Additionally, regional offices adopted mobile technology capabilities to assist with real-time inspection planning and performance. The NRC also launched an organizational culture assessment and identified signposts and markers that will help the agency monitor future supply and demand for nuclear power and use of materials and adjust accordingly.

**a. Are we in any danger of the NRC becoming too lean to conduct its oversight of the nuclear industry adequately?**

**ANSWER.**

In my view, we currently have the resources we need to meet our mission. We are also implementing a Strategic Workforce Planning process to improve our efforts in developing and managing the NRC workforce and to balance near-term work with long-term staffing projections. This process informs the agency's efforts to recruit, retain, and develop a skilled and diverse workforce with the right skill sets to complete our expected work, including oversight of the nuclear industry.

However, there is a risk that we could face challenges in meeting our mission in the future without additional funding. Our agency relies on intellectual capital to fulfill its safety mission; thus, pay and benefit increases have an outsized effect on our budget.

Additionally, given the agency's workforce demographics and projected attrition, the agency needs to hire new talent in the coming years to address critical skill gaps. Thus far, we have been able to absorb increases in salaries and benefits through attrition coupled with prudent hiring. However, in my view we have reached the limit of our ability to continue to absorb such increases while continuing to reduce our budget by several percent each fiscal year.

We also face challenges given the significant budgetary changes required by the Nuclear Energy Innovation and Modernization Act and we may need your help to address these challenges in the future.

**b. How is the NRC staff reacting to the agency's efforts to become more agile and risk-informed? Has it harmed morale at the agency?**

**ANSWER.**

My understanding is that there has been healthy dialogue regarding the agency's most recent efforts to become more agile and risk-informed. These efforts are aimed at allowing the NRC to focus its attention on the issues that are most important to the health and safety of the public. I have been told that some staff view these efforts as a change from past practice while others see the efforts as part of the NRC's long-standing approach to risk-inform our work, consistent with the NRC's Efficiency Principle of Good Regulation.

Across the NRC, senior executives, managers, and supervisors have been working to ensure that the staff shares a common understanding of what being risk-informed means and how it

translates to performing daily work. We have a team specifically addressing all concerns and views.

**c. Has it compromised the NRC's ability to do its due diligence and ensure safety?**

**ANSWER.**

Accepting risk in decision making has not compromised the NRC's ability to do its due diligence and ensure safe nuclear operations. Our efforts in this area further enhance NRC's regulatory effectiveness by concentrating the agency's activities on the most important issues. This helps ensure that agency resources, including staff effort, expertise, and time, are focused on those areas that are most risk significant. This is consistent with our mission and the NRC's Principles of Good Regulation.

**QUESTION 2. According to the NRC's FY 2021 Congressional Budget Justification, since FY 2014, the agency budget has fallen by 17 percent and its workforce by 25 percent. Is the workload also decreasing at a similar rate?**

**ANSWER.**

Since fiscal year 2014, the NRC has reduced its workforce to account for a decrease in workload resulting from potential applicants not pursuing new nuclear reactor builds, the early closure of operating reactors, and completion of post-Fukushima activities. At the same time, work has increased in some areas like decommissioning, subsequent license renewal, and advanced reactors. The NRC has been able to accommodate the additional decreases in its budget through organizational restructuring, added efficiencies in our licensing and oversight programs, and limiting the hiring of agency staff to those skills that are critical to the agency operations or not available within the existing agency workforce.

- a. **Or are there simply fewer employees now being asked to do more? Is this compromising the NRC's ability to do its work?**

**ANSWER.**

While there has been a decrease in NRC's staffing levels from 2014, this has not resulted in compromising the NRC's ability to fulfill its mission. The NRC's budget request reflects the FTE necessary to accomplish the expected workload.

- b. **Has the slimming down of the NRC led to more work getting deferred?**

**ANSWER.**

The NRC is appropriately resourced to accomplish its mission. The decrease in NRC's staff has not resulted in its regulatory oversight work being deferred. The NRC has taken steps through Project Aim and the Transformation Initiative to achieve efficiencies through restructuring, streamlining, re-baselining, and adopting innovative approaches to performing work. These efforts have provided for flexibility in reprioritizing work consistent with adjustments made in applicants' schedules.

- c. **Is there a growing backlog?**

**ANSWER.**

No. The NRC continues to meet the overall milestones for current application reviews and other scheduled oversight activities. The NRC has taken specific actions to address the previous licensing backlog to ensure greater discipline and management oversight. This has enhanced the agency's efficiency, effectiveness, and predictability, while maintaining a continued strong safety focus.

- d. **Is it taking longer to complete your work to keep us safe while also getting back to businesses in a reasonable timeframe?**

**ANSWER.**

The NRC continues to meet all milestones and schedules identified for regulatory activities as established by Congress and/or with applicants and licensees. The NRC continues to engage applicants and/or licensees in a timely manner when reviewing licensing requests to ensure any outstanding issues or requests for additional information are resolved effectively and efficiently.

**Senator Cramer:**

**QUESTION 3.**

**Mr. Wright, while North Dakota does not have any nuclear facilities in the state, we receive reliable, baseload generation from North Dakota coal and two nuclear facilities in Minnesota operated by Xcel Energy. Coal and nuclear contribute to a reliable, affordable grid back home. They also frequently have to backfill energy losses when the wind is not blowing. We saw this most dramatically last winter, when coal and nuclear had to compensate for lost generation from wind and natural gas. It was too cold for wind turbines to operate and natural gas supply fell short as home heating demand increased. Thankfully coal and nuclear filled the gap; however, both of these sources of energy are often taken for granted. In the case of nuclear, as you know, it generates over half of our carbon free electricity and about 20 percent of our nation's total electricity. Utilities who possess a nuclear fleet rely on their generation to reduce their total carbon emissions while providing reliable power**

**to consumers. Can our nation reduce emissions and provide affordable and reliable power without our existing nuclear fleet?**

**ANSWER.**

The NRC is an independent safety regulator and does not set the United States' energy policy or promote any particular technology. However, I recognize that nuclear energy is currently a significant generator of carbon-free electricity.

While we do not set energy policy or promote nuclear technology, the NRC must ensure that we have an effective framework to regulate the licensing of new technologies, including those that would reduce carbon emissions and provide affordable and reliable power. The NRC will continue to effectively regulate our currently licensed nuclear power plants and actively prepare to regulate new nuclear technologies that the Department of Energy and the industry are developing. The NRC has worked with outside experts to identify potential future scenarios and related insights that will inform our near- and mid-term planning related to workload, workforce issues, and opportunities to innovate. The NRC is taking concrete steps now to ensure that we are flexible enough to meet whatever challenge or innovate technology is ahead.

**QUESTION 4.      Many downplay nuclear generation without much of a positive outlook. I however am excited about the potential. Considering recent closures of nuclear facilities and the labyrinth of regulatory hurdles for new plants, do you believe nuclear generation has a positive future beyond the status quo?**

**ANSWER.**

The NRC is prepared to continue to effectively license the current fleet of nuclear reactors and to safely, effectively, and efficiently license new nuclear technologies.

Consistent with the Nuclear Energy Innovation and Modernization Act and the NRC's Principles of Good Regulation, the NRC has and must continue to ensure that we have an effective framework to regulate the licensing of new technologies, especially those that could improve the safety and security of nuclear energy in this country. We have an obligation to all our stakeholders to implement a framework for advanced reactors that maintains safety without stifling innovation and the use of new technologies. The public deserves a predictable and efficient licensing process for advanced technologies.

The NRC has made significant progress in establishing performance metrics and milestones for licensing and other regulatory actions. The NRC is developing a regulatory framework for advanced nuclear technologies and is actively engaged in pre-application activities and reviews. Specifically, the NRC has received the first application for an advanced non-light water microreactor from Oklo, and the staff is engaged in pre-application meetings with several other developers including General Electric-Hitachi, Kairos Power, Terrestrial Energy, X-Energy, Westinghouse, TerraPower, and General Atomic.

The staff also recently issued an advanced safety evaluation report for the NuScale small modular reactor in December 2019 and is working to complete the final review of the design certification by the end of 2020. Additionally, the staff recently concluded that developing a Generic Environmental Impact Statement for advanced reactors is a viable alternative to support the NRC's regulatory decision-making and streamline the review process.

**QUESTION 5.**        **Do you believe there is a future for advanced nuclear, especially in rural, remote areas? If so, please explain.**

**ANSWER.**

The NRC staff has been actively engaged with advanced reactor developers, Department of Energy, Department of Defense, and other stakeholders to identify and resolve any policy and licensing issues related to advanced reactors, including microreactors for deployment in rural, remote areas.

The NRC has also taken many steps to prepare for the review of advanced nuclear technology. This preparation includes the NRC's development of a regulatory strategy for the possible deployment of microreactors in remote communities. This strategy is part of the overall strategy for advanced reactors and implementation of the Nuclear Energy Innovation and Modernization Act. The NRC recently received Oklo's application to develop a non-light water microreactor to be constructed in Idaho Falls, Idaho.

**QUESTION 6.**        **The NRC operates on fees collected by nuclear plants. With plants slated for closure, NRC's recent budget asks for an increase rather than reflecting the expected reduction. That seems backwards. Shouldn't your budget be commensurate to how successfully you regulate the industry?**

**ANSWER.**

The NRC regulates the nuclear industry successfully by focusing on our safety and security mission, regardless of the number of operating nuclear power plants. Regarding the NRC's fiscal year (FY) 2021 budget request, the request does reflect reductions for the expected closures of operating plants. The request also reflects reductions based on efficiencies the

NRC has gained in our licensing and oversight programs, as well as reductions tied to the completion of work in various areas. Notwithstanding these reductions, the NRC's budget request has increased overall because of the need for resources to support other mission-related work and ensure we can meet our important safety and security mission.

The NRC systematically accounts for the anticipated closure of operating reactors when formulating its budget by including a proportional reduction per site in the areas of oversight, licensing, rulemaking, research, event response, and investigations. In FY 2021, the NRC reduced its budget by \$1.5M, including eight full time equivalents, to account for the anticipated closure of the Duane Arnold Site at the end of the first quarter of the fiscal year.

The operating reactor budget also decreased in FY 2021 to account for efficiencies gained from the merger of the Offices of Nuclear Reactor Regulation and New Reactors, as well as efficiencies gained through recent changes in processing licensing actions. In addition, the operating reactor budget decreased because of reductions in research activities, the completion of post-Fukushima flooding and seismic probabilistic risk assessment reviews, completion of post-Fukushima related inspections, completion of the safety and environmental reviews of the subsequent license renewal applications for Turkey Point Nuclear Generating Station and Peach Bottom Atomic Power Station, and the anticipated completion of the safety and environmental reviews of the subsequent license renewal application for Surry Power Station.

These decreases to the operating reactor budget were offset by increases primarily to support three new subsequent license renewals applications for North Anna Power Station and two additional unspecified plants; the anticipated influx of accident tolerant fuel (ATF) topical reports; the development of licensing infrastructure for ATF, high burn-up and higher enrichment in both ATF and current fuel designs; the licensing and construction oversight of medical radioisotope

irradiation and processing facilities; and the anticipated transition of Vogtle Electric Generating Plant, Unit 3, to the Reactor Oversight Process.

**QUESTION 7.**        **The recent NRC budget proposal also provides no funding for licensing a permanent repository for nuclear waste. The lack of action is costing taxpayers over \$2M per day and is forcing utilities to do onsite storage for its spent nuclear fuel in areas it was never intended, which is causing a great deal of frustration to local communities and tribes, particularly in Minnesota. We have a legal obligation to deal with this waste and we know we can in a responsible manner. Once a long-term solution is determined, will the NRC work expeditiously towards licensing these storage facilities? What kind of positive effect would long-term waste storage facilities have on our domestic nuclear fleet?**

**ANSWER.**

Yes, the NRC will work expeditiously towards reaching a licensing decision on any long-term solution regarding nuclear waste that is authorized and funded.

If long-term nuclear waste storage facilities become available, one positive effect could be that plants that have completed decommissioning and are operating only to maintain an Independent Spent Fuel Storage Installation (ISFSI) may be able to decommission the ISFSI, terminate their licenses, and release the land for other uses. I would emphasize, however, that the NRC's role is to ensure nuclear waste is stored safely, regardless of whether such facilities are authorized and funded.

**Senate Committee on Environment and Public Works**  
**Hearing entitled, “*Hearing on Nominations*”**  
**March 11, 2020**  
**Questions for the Record for Mr. Hanson**

**Chairman Barrasso:**

1. The Atomic Energy Act of 1954 requires the regulation of nuclear material to provide a “reasonable assurance of adequate protection” to public health and the environment.

- a. What does “reasonable assurance of adequate protection” mean to you?

ANSWER: The NRC’s mandate is to provide reasonable assurance of adequate protection of public health and safety in the civilian use of nuclear material. I see adequate protection as the minimum standard the NRC must require. Additional requirements would have to have benefits that outweigh their costs. Adequate protection does not mean zero risk. The NRC’s regulations do not define adequate protection, but compliance with them should be presumed to assure adequate protection, at a minimum.

- b. If confirmed, how would this guide your decision making as an NRC Commissioner?

ANSWER: Because the adequate protection standard is not zero risk, the Commission has the responsibility to determine how much risk is acceptable and when adequate protection exists. I plan to use the adequate protection standard to guide my decisions, using input from the NRC staff, the general counsel, and the views of industry and public stakeholders.

2. Your testimony states, “I grew up in Southwest Michigan just a few miles from the Palisades Nuclear Generating Station. As the test of the plant’s emergency alert system blared from telephone poles each month, I understood early on the value of a reliable, independent regulator to ensure that the communities surrounding the nation’s nuclear plants are safe.”

However, the NRC’s regulatory programs are based on the fundamental principle that the safety of commercial nuclear power reactor operations is the primary responsibility of NRC licensees. For example, NRC licensees fund and maintain the community’s emergency alert system.

- a. Do you agree with this fundamental principle? If not, please explain your position?

ANSWER: I do agree with the fundamental principle that the licensee has the day-to-day responsibility that the plant operates safely. Also, it is an NRC requirement that there be an emergency alert system and that it works properly. NRC's role is to establish safety and security requirements for the nuclear industry as a whole and to ensure that individual nuclear power plants comply with NRC rules and regulations.

3. If confirmed, how will you balance the input and recommendations of the NRC's career staff with the decision-making authority vested in you as a commissioner?

ANSWER: The NRC staff is what makes the NRC the "gold standard" for nuclear regulators around the world. I look forward to learning from their experience and expertise. At the same time, it is the Commission's responsibility to determine what constitutes reasonable assurance of adequate protection of the public health and safety. If confirmed, I intend to learn all I can from the staff and to question their recommendations in order to make informed decisions.

4. Two years ago, the Commission launched a "Transformation Initiative" to move the agency towards a modern, risk-informed regulatory approach. This is critical to improving the effectiveness of the organization to respond to an evolving nuclear industry. It is important that changes adopted under this initiative are sustainably incorporated into the agency's culture. A former NRC advisor once described the Commission like a balloon, as long as you apply pressure, the balloon will be changed; but as soon as the pressure is released, it goes right back to its original shape.

- a. What is your view of NRC's Transformation Initiative?

ANSWER: I view the Transformation Initiative as a means to prepare the NRC to license new technologies in a risk-informed, effective, and efficient manner, which is essential if there is going to be a nuclear industry in the future. It seems to me that changing the agency from the inside using the input of external stakeholders will ensure that safety remains the NRC's top priority as the agency evolves.

- b. If confirmed, how will you ensure changes resulting from the Transformation Initiative will endure?

ANSWER: If confirmed, I look forward to working with the NRC staff to implement their proposals as well as identify continuing improvements as the changes are implemented. The Commission's role in the transformation will be to lead in a manner that exemplifies the goals of the initiative, in particular, modeling the cultural shift to becoming a modern, risk-informed regulator.

- 5. Accident Tolerant Fuels (ATF) are expected to enhance the safety of operating nuclear power plants, as well as offer potential economic benefits resulting from increased time between refueling outages. The Commission must license the fuels for use to realize these benefits.

- a. If NRC approves ATF for use, should the NRC credit ATF's enhanced safety and performance into the regulatory requirements of nuclear power plants?

ANSWER: Depending on the type of accident tolerant fuel and its specific characteristics with regard to increased tolerance of accident conditions, yes, in general, NRC should evaluate crediting such specific fuel's enhanced safety and performance into regulatory requirements.

- b. If confirmed, will you prioritize activities to approve the use of ATF?

ANSWER: If confirmed, I intend to prioritize NRC activities that enable the safe licensing of Accident Tolerant Fuels, as I believe it presents a unique opportunity to reduce risk and cost of current fleet operations.

- 6. New Mexico Governor Lujan Grisham wrote the Commission to state her opposition to the licensing of a consolidated interim storage facility in her state. If confirmed, how would you consider the opposition of a state government into your decision to approve or disapprove an NRC license?

ANSWER: I understand that the NRC has regulations and procedures for registering concerns from outside entities regarding specific licensing actions. I also understand that NRC would typically consider the input of state governments insofar as the state must issue specific permits for the facility to proceed (such as water withdrawal permits or rights of way for utility infrastructure). I am not currently aware of other specific

conditions under which the NRC would consider state government input. I understand it is the NRC's role to determine whether a license should be issued based on the applicant's ability to comply with NRC regulations. It is not the NRC's role to set national policy on storage and disposal of spent nuclear fuel.

7. In a letter to Congress on March 19, 2018, the Commission stated the NRC does not have authority to issue a license to any entity other than the Department of Energy for a facility to permanently dispose of spent nuclear fuel and high-level radioactive waste. Do you agree with the Commission's position?

ANSWER: I understand that the Nuclear Waste Policy Act does not envision a licensee for permanent disposal of spent nuclear fuel and high-level radioactive waste outside of the Department of Energy.

8. The NRC's career staff recently recommended changes to the Commission's inspection programs. At a recent Committee hearing, a Commissioner expressed concern "about a lot of the proposals to reduce inspections in order to save money" and suggested changes are done "just to save money."
  - a. Do you believe the NRC's career staff recommended changes to NRC's oversight and safety programs to "save money?"

ANSWER: I'm not aware of the impact on nuclear power plant operating costs of any particular regulatory proposal pending before the Commission. I understand that cost is a factor in developing and evaluating new regulations and changes to existing procedures and regulations.

- b. Do you believe it is proper for a Commissioner to question the motives of the NRC's career staff?

ANSWER: If confirmed, I do not intend to question the motives of NRC career staff or my fellow Commissioners, who, in previous interactions, I have found to be exemplary public servants.

- c. Will you commit that if you are confirmed as a Commissioner, you will respect the career staff's decision-making process?

ANSWER: In my interactions with NRC staff over the last six years, they have demonstrated a very high level of technical expertise, professionalism, and dedication to NRC's mission. If confirmed, I expect such interactions will continue and I will respect their decision-making process.

9. The need for a predictable regulatory framework is well known. However, predictability is just one component of a successful regulatory framework. Efficiency is one of NRC's Principles of Good Regulation. Regulatory decisions must also be made in a timely and affordable manner.

a. Do you recognize the need for an efficient, timely, and affordable process for NRC's permit, licensing, and certification decisions?

ANSWER: I recognize the importance of all Principles of Good Regulation: independence, openness, clarity, reliability, and efficiency. Efficiency is important so that regulatory decisions take no less or no more time or money than necessary to provide reasonable assurance of adequate protection.

b. If confirmed, how will you ensure NRC's licensing and regulatory processes are predictably efficient, timely, and affordable?

ANSWER: If confirmed, I plan to abide by the Principles of Good Regulation, and hold myself and the NRC staff to the standards and milestones that have been put in place to live up to those principles. Once all relevant information is available, I plan to make decisions expeditiously.

10. The Nuclear Energy Innovation and Modernization Act (NEIMA) requires the NRC to establish a regulatory framework to license and deploy advanced nuclear technologies. New nuclear reactors can be smaller, safer, and more efficient. The law requires the safety rules to reflect those attributes.

a. Do you support establishing safety regulations commensurate with the risk and performance of advanced nuclear technologies?

ANSWER: It is incumbent upon the developers of advanced nuclear technologies to demonstrate through a variety of methods how the technology in question meets NRC regulatory requirements. NRC is obligated to apply its regulations in

a clear and reliable manner, taking into account, where applicable, the improved safety characteristics of the technology under review.

- b. If confirmed, how will your decisions incorporate this principle?

ANSWER: If confirmed, I will work to ensure that NRC has the confirmatory data from reactor vendors, international partners, and Department of Energy laboratories needed to make licensing decisions consistent with the risk and performance of advanced technologies.

11. The NRC's fiscal year 2021 budget request for corporate support exceeds the limit set by NEIMA. If confirmed, will you support actions to reduce these costs to ensure compliance with the law?

ANSWER: I understand that in NEIMA, Congress intended to limit NRC corporate support spending at certain prescribed levels to the maximum extent practicable. NRC should seek out ways to conduct its business more efficiently and cost-effectively. NRC also needs a certain level of base corporate support in order to sustain ongoing fee-based regulatory actions. Furthermore, NRC should also make investments in its staff and overhead infrastructure to support future workloads and new ways of doing business.

12. The Government Accountability Office (GAO) has issued four reports since 2017 identifying the need to improve budget management at the NRC. [GAO-17-232, GAO-17-294, GAO-18-318, GAO-20-362]

- a. Are you familiar with these reports?

ANSWER: I am generally familiar with these reports.

- b. If so, please provide your response to GAO's findings and recommendations. If not, will you review the reports?

ANSWER: In general, GAO recommends that NRC follow its own Principles of Good Regulations in setting budgets and fee levels. GAO also recommended that NRC follow standard project management practices in deploying a new electronic billing system for licensees. I understand that NRC has taken steps to stabilize its budget structure in order to increase comparability across years. I also understand that NRC has expanded information available on how it sets fees. Based on my experience on the Appropriations Committee, these are important steps, but

increased transparency and clarity is needed so that Congress and licensees have confidence that NRC is using its resources efficiently and appropriately.

- c. If confirmed, how will you approach budget development, execution, and fee collection at the NRC?

ANSWER: If confirmed, I will work with my fellow Commissioners to ensure that NRC's fee setting and budget development and execution follow the Principles of Good Regulation, especially openness, clarity, and reliability.

13. American nuclear companies plan to license and deploy new technologies around the world. This highlights the need for international collaboration between national nuclear safety regulatory agencies. How should international regulators collaborate to license technologies that will be globally deployed and what is the appropriate role for the NRC?

ANSWER: One opportunity for collaboration among nuclear safety regulators may be in sharing empirical data around the performance of key safety related components. National nuclear laboratories in the United States, United Kingdom, South Korea, and elsewhere have conducted extensive irradiation tests and post-irradiation examinations on materials and components that can be shared, with the appropriate caveats for security and intellectual property, and used as a partial basis for licensing actions in multiple countries. I understand that the NRC is engaged in a wide range of bilateral or multilateral agreements through which it can share research and performance and confirmatory data where appropriate.

14. In 2015, the Commission approved the NRC career staff's recommendations related to a "fresh assessment of foreign ownership, control, or domination (FOCD) of utilization facilities." [SRM-SECY-14-0089]

- a. Are you familiar with the Atomic Energy Act's FOCD provision and how the NRC implements the policy?

ANSWER: I am not familiar with the Atomic Energy Act's FOCD provision. If confirmed I will examine this issue and be prepared to deliberate specific actions before the Commission.

- b. If confirmed, would you support the Commission's previous decision to take a fresh look at FOCD requirements based on current risks and opportunities?

ANSWER: In general, I support taking a fresh look at previous decisions based on current risks and opportunities. If confirmed I will examine this issue and be prepared to deliberate specific actions before the Commission.

15. The NRC has an established process to issue exemptions for emergency planning to align requirements commensurate with the reduced risk as reactors undergo decommissioning. This process has been consistently applied for the nine commercial power plants sites fully in the decommissioning process.

- a. Should requirements on decommissioned nuclear reactors reflect the facility's reduced risk?

ANSWER: I agree that the NRC should impose requirements commensurate with the risk posed by a facility. I understand that the NRC staff has performed a number of studies on the safety of spent fuel pools and dry cask storage to determine appropriate safety measures. The NRC has also required enhanced mitigation strategy capabilities since the events of Fukushima. I understand that the NRC uses this information when it evaluates exemption requests to determine that they do not present an undue risk to public health and safety and are consistent with the common defense and security. I agree that once the fuel has been removed from a reactor's core, it generally poses a lower risk than an operating reactor, and emergency planning requirements should change with the changed facility and risk profile.

- b. Do you agree that it is appropriate to continue this well-established process?

ANSWER: I agree that decommissioning reactors should not have to meet all of the same requirements as operating reactors. This could be accomplished through exemptions from license requirements or rulemaking.

16. The use of radiological material for medical purposes is extremely beneficial, especially to diagnose and treat cancer. Through the licensing and oversight of nuclear material, NRC plays a critical role to allow the use of radioactive material for medical applications.

- a. Are you familiar with NRC's role to regulate and oversee the medical use of radioactive materials?

ANSWER: I am generally familiar with NRC's role in regulating and overseeing the medical use of radioactive materials.

- b. Do you agree that it is important to continue producing isotopes and developing other radiological treatments for medical use?

ANSWER: I agree that it is important to continue to produce isotopes and other radiological treatments for medical use, particularly where there are no non-radiological substitutes available.

- c. If confirmed, how will your decisions regarding the medical use of nuclear material reflect the associated societal benefits of the technology?

ANSWER: I understand that NRC licenses the material that goes in medical devices and not the devices themselves. Therefore, NRC should apply clear and consistent requirements, including security requirements, to the possession and use of these materials to enable their continued use.

17. The Atomic Energy Act of 1954 grants the NRC the sole authority to license and oversee the safety of our nation's civilian nuclear power plants. The Federal Emergency Management Agency's (FEMA) Radiological Emergency Preparedness (REP) program provides a complementary role by interfacing with state, local, and tribal stakeholders to assure NRC licensees meet all offsite emergency preparedness (EP) requirements. Establishing emergency preparedness requirements is the responsibility of the NRC.

- a. Do you agree that the NRC maintains the sole regulatory authority to establish emergency planning requirements?

ANSWER: I understand that NRC has the sole regulatory authority to establish emergency planning requirements.

- b. If confirmed, will you ensure that risk-informed EP requirements are incorporated into the regulatory framework for advanced reactors, as directed by NEIMA?

ANSWER: The emergency planning requirements for advanced reactors should be commensurate with the risks posed by the technology as demonstrated by empirical data and rigorous computer modeling. If confirmed, I will work to ensure all emergency planning requirements for advanced reactors are risk-based.

18. The Commission has been examining how to allow the use of digital instrumentation and controls (I&C) since 1994. To date, the NRC has limited the use of digital I&C.

- a. How do you view authorizing the use of digital I&C in nuclear power plants?

ANSWER: I generally favor the use of digital I&C in nuclear power plants, as analogous systems have been safely deployed in the aircraft and automotive sectors.

- b. If confirmed, will you prioritize decisions that allow current licensees to safely utilize digital I&C?

ANSWER: If confirmed, I intend to look closely at this issue and better understand the challenges in licensing these technologies.

- c. If confirmed, will you prioritize work to allow the safe use of digital I&C in advanced nuclear reactor designs?

ANSWER: If confirmed, I will work to ensure that the digital I&C systems that are inherent in advanced nuclear reactor designs are evaluated within that context for their performance and safety characteristics.

19. The NRC ended fiscal year 2019 with over \$60 million in carryover. The amount of carryover has increased over the past few years.

- a. What is your view of this trend of increasing carryover funding?

ANSWER: Increasing carryover funding, in general indicates that NRC has been appropriated too much money by Congress or collected too much money from licensees for the projected workload.

- b. If confirmed, what actions will you take to limit carryover?

ANSWER: If confirmed, I commit to working to improve the NRC's estimates and assumptions in its budget process. While the NRC will never be able to propose a budget that is precise to the penny, increased Commission scrutiny and improved planning estimates can decrease the amount of carryover.

20. One research study claims that a fire in a spent fuel pool could “dwarf the impact of Fukushima” and demands action be taken to address this risk. NRC’s technical staff disagree with the study’s findings because the likelihood of a spent fuel pool fire is extremely low. Other experts share NRC’s assessment.

- a. Do you agree with the NRC staff’s determination that the likelihood of a fire in a spent fuel pool is extremely low?

ANSWER: I agree that the likelihood of a fire in a spent fuel pool is extremely low.

- b. Do you believe the NRC needs to implement new requirements to address the potential of a fire in a spent fuel pool?

ANSWER: I am not familiar with the current requirements to address the potential of a fire in a spent fuel pool and therefore can not take a position on whether new requirements are needed.

- c. If confirmed, how will your regulatory approach incorporate probabilistic risk assessments and other quantitative approaches to event likelihood and consequence?

ANSWER: Probabilistic risk assessment is a powerful tool for assessing accident scenarios and performance parameters. It is most useful when informed by substantial quantitative data derived from experiments or field assessments. If confirmed, I will place a priority on ensuring that probabilistic risk assessments are informed by quantitative data derived from real-world analyses and observations.

21. The NRC launched the Independent Spent Fuel Storage Installation (ISFSI) Inspection Program Enhancement Initiative to develop a clear and comprehensive, risk-informed approach to ISFSI inspections that is consistent across all regions. The NRC staff recommended actions to enhance the existing program, such as focusing on the most safety significant items. The staff also recommended reducing the frequency of routine inspections, in part because fuel storage casks are continually monitored. Do you support aligning NRC’s inspection requirements based on an enhanced understanding of risk?

ANSWER: I support aligning inspection requirements based on an enhanced understanding of risk.

22. NRC's Principles of Good Regulation focus the Commission on ensuring safety and security while appropriately balancing the interests of the NRC's stakeholders.

a. Which of these principles are most important to you?

ANSWER: All of the Principles of Good Regulation are important for providing assurance of adequate protection. If confirmed, Openness and Reliability are likely to be most important to me.

b. If confirmed, how will your regulatory approach reflect these principles?

ANSWER: If confirmed, I plan to abide by all the Principles of Good Regulation, and hold myself and the NRC staff to the standards and milestones that have been put in place to live up to those principles. Openness is critical to maintaining public confidence in NRC's actions and its role as an independent regulator. Reliability ensures a level of predictability and certainty among licensees and the public about the basis for NRC actions.

23. Overall performance of our nation's nuclear power plants has steadily improved over the last two decades. The Institute of Nuclear Power Operations (INPO) recently testified that there is a correlation between a nuclear power plant's performance and safety. Do you agree with INPO's assessment?

ANSWER: While I do not have direct knowledge of INPO's conclusion or the data on which it is based, I generally agree that there is a correlation between nuclear power plant performance and safety.

24. The world has changed radically since the events of September 11, 2001. In the wake of that tragedy, U.S. nuclear power plants increased their security measures to make them the most heavily defended privately-owned facilities in the world.

a. What are your views regarding the necessary balance and division of responsibilities between the U.S. Government and the private sector?

ANSWER: Licensees are best situated to provide security for their facilities. I do not think the government should provide security forces at private facilities. At the same time, the government has access to intelligence information and data

from across the industry, so it is necessarily the government's role to set security requirements and ensure they are met.

- b. What are your views on the availability of federal, state, and local law enforcement, and whether NRC licensees should be able to rely on those agencies as part of their NRC-required protection strategies, in the unlikely event of an attack on a nuclear power plant?

ANSWER: When creating safety and security plans, it seems appropriate for licensees to consider the response from law enforcement agencies for overall strategies. While I am not familiar with how the NRC reviews licensees' security plans, it seems appropriate for the NRC to take this into account. I look forward to learning more about this issue, if confirmed.

25. The Backfit Rule requires that new or amended regulatory requirements on NRC licensees yield a substantial safety benefit and are cost-justified. The cost-benefit analysis should consider all available data, but reliance on qualitative factors should be used in a "judicious and limited manner to inform decision-making." The rule is essential for the agency to adhere to NRC's Principles of Good Regulation.

This Committee has documented concerns about the Commission's lack of adherence to the rule. The concerns include overreliance on qualitative factors, misapplying exceptions that permit new requirements without a cost-benefit analysis, and limited review by the NRC's Committee to Review Generic Requirements (CRGR).

The current Commission has acknowledged challenges with the application of this rule and recently taken steps to calibrate agency policy about its implementation. The Commission has also recognized the implications of "forward-fitting," in which staff imposes new requirements on the basis of compliance, without an adequate demonstration of the regulatory basis.

- a. Are you familiar with the NRC's Backfit Rule, recent agency precedent of its application, and current guidance on backfitting and forward fitting?

ANSWER: I am aware of the NRC's Backfit Rule, but I am not familiar with its details or implementation.

- b. If so, please provide your views on the issue. If not, will you commit to conducting a thorough review of the rule, recent agency action, and current guidance?

ANSWER: I commit to a thorough review of the rule and the agency's recent actions and guidance, if confirmed.

- c. Do you support the use of a rigorous cost-benefit analysis, when appropriate, to inform the NRC's regulatory decisions?

ANSWER: I support cost-benefit analyses where they are appropriate, which I understand for the NRC to be for requirements beyond reasonable assurance of adequate protection of public health and safety.

- d. Do you believe that the use of qualitative analysis should be limited in NRC's regulatory actions?

ANSWER: I am not familiar enough with the NRC's use of qualitative factors to have an opinion at this time, but I commit to reviewing the issue if confirmed.

- e. Please provide your view on the role of the CRGR.

ANSWER: I understand that the CRGR is a panel of NRC staff who review generic requirements for their compliance with the Backfit Rule. While I am not familiar with the specifics of how and when the CRGR is used, it seems to me to be a helpful resource for NRC decision making.

- f. If confirmed, will you be diligent in ensuring your actions, and the actions of NRC staff, are consistent with the Backfit Rule and current agency guidance?

ANSWER: I will commit to ensuring that my actions will be consistent with the Backfit Rule and its associated guidance.

- 26. The NRC has the sole authority to license and oversee the safety of our nation's civilian nuclear power plants. However, multiple states have attempted to influence the NRC's well-established regulatory process. If confirmed, how will you ensure the NRC preserves its authority to regulate and oversee the use of nuclear materials as authorized in the Atomic Energy Act of 1954 and the Energy Reorganization Act of 1974?

ANSWER: I understand that multiple states have a strong interest in influencing the decommissioning process for nuclear reactors. As you note, federal law preempts state statute in this area. NRC should have avenues to constructively engage state

governments on decommissioning and regulation of nuclear materials; however, except where delegated through the Agreement State program, NRC should retain clear regulatory authority.

27. During the Environment and Public Works Committee hearing on NRC's fiscal year 2021 budget request, it was suggested that any reduction in the NRC's budget will result in a reduction in nuclear safety. In 2005, the Commission was provided a total budget authority of \$669 million to oversee 103 operating power plants. This year, the Commission is provided \$855 million to oversee 96 operating power plants, down from a peak that exceeded \$1 billion.

a. Do you believe the Commission can reduce costs without reducing safety?

ANSWER: Based on the significant decrease in the NRC's budget over the past several years, it is clearly possible for the NRC to reduce its budget without reducing safe oversight of operating and decommissioning reactors and nuclear materials licensees, while also preparing to license the next generation of nuclear facilities.

b. If confirmed, will you work to reduce budget and staff resources commensurate with the reduced workload when nuclear power plants shut down?

ANSWER: If confirmed, I commit to ensuring that the NRC's budget reflects the agency's workload.

28. The NRC has a well-established process for renewing operating licenses for nuclear power plants. Of the 96 operating reactors, 88 have received an initial license renewal following this process. NRC staff determined that the Commission's process to approve an initial license renewal were appropriate to use when considering issuing a second, or subsequent license renewal. The Commission has granted a subsequent license renewal following this same process.

a. Do you agree that the well-established process for initial license renewals is adequate to use for subsequent license renewals?

ANSWER: I expect the process used by the NRC to renew reactor licenses for 20 years would be a solid foundation for renewing licenses for an additional 20

years. If confirmed, I look forward to learning about the subsequent license renewal process from the NRC staff.

- b. If confirmed, will you support an efficient and predictable process to approve subsequent license renewals?

ANSWER: If confirmed, I commit to supporting an efficient and predictable process for all licensing actions, including subsequent license renewals.

29. Do you believe it is appropriate for the NRC to periodically assess and adjust the level of oversight it provides to NRC licensees? Why or why not? What factors should the NRC consider when assessing the effectiveness and efficiency of its regulatory programs?

ANSWER: It is appropriate for NRC to periodically assess and update the level of oversight of licensees. NRC should take into account the accumulation of knowledge and experience both within NRC and among licensees as part of this assessment. Both licensees and the NRC have opportunities to share knowledge regarding performance and risk and should do so. Minimizing regulatory uncertainty through openness, clarity, and reliability is important; periodic assessments should be conducted in a way that is predictable and provides the greatest opportunity for input by a wide array of stakeholders.

30. During your confirmation hearing, you said that “if we can gather information about plant performance in a more efficient way, then I think those opportunities can and should be considered in ways that don’t undermine the knowledge base that we have.”

- a. Please expand on that statement.

ANSWER: Much of regulation is fundamentally about “how we know what we know”, in this case about nuclear plant operations and safety. Affordable digital systems and sensors provide an opportunity to monitor some safety significant systems more efficiently and cost effectively. Other systems may need to continue to be monitored by direct observation. As noted above, NRC should periodically evaluate and potentially update its requirements based on the most current understanding of performance and risk. Part of this evaluation should ask, “Do we still need all the information we have been gathering and are there new pieces of information that we need?” And secondly, “What is the most efficient way of gathering the information we need to provide reasonable assurance of

adequate protection?” Within those questions is a lot of trade space that maintains or strengthens the basis of knowledge for adequate protection.

- b. If confirmed, what will this mean in terms of your regulatory approach as a Commissioner?

ANSWER: If confirmed, I will be open to regulatory reforms that incorporate new technologies and approaches that maintain or enhance the current knowledge base about performance and risk.

31. The Atomic Energy Act of 1954 provides that “the development, use, and control of atomic energy shall be directed so as to make the maximum contribution to the general welfare.” The NRC is not responsible for promoting nuclear energy, but given the Atomic Energy Act’s language, do you believe that the NRC has a responsibility to regulate in a way that enables the use of civilian nuclear power so long as adequate protection of public health and safety and common defense and security is maintained? Why or why not?

ANSWER: I agree that the NRC’s mandate is to ensure reasonable assurance of adequate protection of the public health and safety and the common defense and security. I also agree that while the NRC does not promote nuclear energy, the NRC should not be a barrier to its development and operation. I see these NRC roles as compatible with the statutory direction.

32. The Office of Nuclear Reactor Regulation recently adopted the motto “We Make Safe Use of Nuclear Technology Possible.” What are your views on this statement, based on your understanding of the Atomic Energy Act of 1954 and the NRC’s overall mission?

ANSWER: I look forward to better understanding how this motto fits with NRC’s overall approach to regulation and the Transformation Initiative.

33. In your testimony, you stated that you would bring a “respect for private sector decision-making.”

- a. Please explain what this means to you.

ANSWER: As former Exelon chief executive officer John Rowe said, “Nuclear is a business, not a religion.” Respecting private sector decision-making means that businesses will make decisions in their own interests. As a regulatory body, NRC should not attempt to push those decisions in one direction or another.

- b. If confirmed, how would your regulatory approach reflect this view?

ANSWER: NRC should follow its mandate to provide reasonable assurance of adequate protection for actions and technologies brought to the Commission by private businesses. It is also incumbent on the NRC to be as reliable and predictable as possible in its regulatory actions, so that private businesses can act with a minimum of uncertainty in the regulatory arena.

34. The Atomic Energy Act Of 1954 provides a role for the states in the oversight of radioactive materials, but prohibits the states from having a role in the radiological safety of nuclear power plants. What is your view on the role of the states in day-to-day operational safety of nuclear power plants and the decommissioning of nuclear power plants?

ANSWER: As I said in my opening statement, I am sympathetic to state and local governments’ desire to have input on federal decision making regarding nuclear matters. However, with regard to operational safety of nuclear power plants, the sole role of ensuring adequate protection of workers and the public does reside with the NRC. I understand that the role of state governments in the decommissioning of nuclear power plants within the context of the Atomic Energy Act is the subject of ongoing discussion. If confirmed, I commit to follow existing laws and regulations.

35. Of the voting papers currently pending before the Commission, which are your priorities?

ANSWER: Of the papers currently before the Commission, if confirmed, I intend to focus initially on the following:

- SECY-19-0117 – Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors
- SECY-18-0103 – Proposed Rule: Emergency Preparedness for Small Modular Reactors and Other New Technologies

36. What policy issues do you anticipate focusing on as a Commissioner?

ANSWER: If confirmed, I intend to focus on three issues: licensing of accident tolerant fuel, the nation's university research and test reactors as incubators for the next generation nuclear workforce, and the licensing of advanced reactors.

37. Based on your experience as a staff member for the Senate Appropriations Committee, what do you believe needs to be improved about the NRC's budget formulation and execution process?

ANSWER: The NRC has taken several steps to improve its budget formulation and execution processes in the last several years, including stabilizing its budget structure and the way it accounts for corporate support costs. However, additional steps could be taken to better plan workforce levels and workloads to reduce the amount of carryover from year to year.

38. Recent market challenges have resulted in the closure of multiple nuclear power plants prior to the end of their operating license.

- a. Please describe your understanding of the current economic challenges of the U.S. nuclear fleet.

ANSWER: Economic challenges to the current fleet fall into three main categories: low natural gas prices, high-upfront capital costs for new nuclear construction, and lack of a consistent mechanism for compensating nuclear plants for clean energy benefits.

- b. In your view, what role does overly burdensome regulation play in those challenges and what responsibility does the NRC have to reduce those burdens?

ANSWER: It is incumbent upon NRC to periodically evaluate its regulations in light of new information on performance and risks. On the basis of this evaluation, NRC should thoroughly consider opportunities to streamline its oversight procedures and requirements in light of its duty to provide reasonable assurance of adequate protection. While I understand NRC fees are a significant cost to operators, the other challenges addressed above drive utilities' decisions to close plants.

**Senator Cardin:**

39. The NRC's workforce is aging. More than half of the employees are over the age of 50, and nearly 30 percent are currently eligible to retire. Meanwhile, younger employees make up a shrinking percentage of the agency, with just 2 percent under the age of 30. The NRC has historically had a staff attrition rate below the federal government annual average of 5 to 6 percent. It now appears to be at 7 percent. We are extending licenses for reactors overwhelmingly built in the 60s and 70s that have been in operation well beyond their original *design-basis*. But the NRC demographic trends indicate that we are losing the staff who have spent much of their careers overseeing these reactors, with all of the scientific, legal, and institutional knowledge they have accumulated. Do you feel that we are in the right place as far as ensuring that this critical knowledge gets passed on to the next generation of regulators?

ANSWER: The NRC staff is what makes the NRC the "gold standard" for nuclear regulators around the world. Therefore, it is critically important that we create "generational overlap" at the NRC to ensure that the knowledge and experience of older workers are passed on in a systematic way to newer employees. It is also important that NRC have the systems and procedures in place to capture the knowledge from older workers to create a substantial resource for future employees. I understand that developing the workforce of the future through early-career and mid-career recruitment efforts is a high priority for the NRC. If confirmed, I look forward to learning more about these efforts and assisting the organization in any way I can in ensuring the workforce remains well-supported and exceptionally well prepared for the future.

## NRC Security: Response, Reinforcement, and Regulation from 9/11 to Now

Prior to 9/11, NRC-regulated facilities were already among the most secure civilian industrial sites in the United States. Nevertheless, the NRC responded to the attacks with significant changes to facility security requirements, including addressing defense capabilities, accident mitigation and emergency preparedness, and communication and information control.

These security requirements were instituted in three overlapping phases: Immediate Threat Response (9/11/2001-12/2001), Security Reinforcement (2002-2007), and Enhanced Security Regulation (2005-present). In the initial months after the attacks, the NRC focused on immediate threat response and assessment of immediate measures to ensure the existing security capabilities of licensed facilities. These actions included immediately-effective Interim Compensatory Measures (ICM) orders and Security Advisories (SA), discussed in more detail throughout this document. After several years of evaluating the implementation related to the initial advisories and security orders, the agency initiated permanent regulatory changes through the rulemaking process in 2005 and finalized security regulations for power reactors in a 2009 final rule.

The agency's actions established a fundamental change in the role of security at NRC-regulated facilities. The 9/11 attacks and the NRC's response raised the visibility of security as a prominent component of the agency's defense-in-depth philosophy, which ensures the public health and safety and the common defense and security, through layers of protection and redundant systems.

### **Immediate Threat Response (September 11, 2001 to December 2001)**

In the days after the 9/11 attacks, the NRC took prompt action to address licensees' defense capabilities, accident mitigation and emergency planning, and communications and information control.

Defensive Capability: Immediately following the attacks, licensees were advised to go to the highest level of security. On September 12, 2001, then-Chairman Richard Meserve ordered the NRC staff to assess and evaluate the likelihood and consequences of an adversary attack against an NRC-regulated facility. Additionally, Chairman Meserve ordered the NRC staff to perform a risk ranking of reactor and non-reactor nuclear facilities and assess the adversary capabilities against which an NRC-regulated facility is required to protect. Radioactive sources were evaluated for their potential to contribute to potential terrorist radioactive dispersal devices. The assessment confirmed that there was low likelihood of an attack that could release enough radiation to pose a risk to the public health and safety. Nevertheless, the assessment provided information regarding adversary capabilities to inform long-term regulatory requirements aimed at hardening facilities against current and evolving threats.

Accident Mitigation and Emergency Planning: The early SAs (e.g., SA-01-XX, "Prompt actions for power reactors, decommissioning reactors, Category I fuel facilities, and gaseous diffusion plants") called for expanded capability to deal with beyond-design-basis attacks, should they occur, and expanded mitigation capabilities for spent fuel pools at operating reactors.

Communication and Information Control: The NRC coordinated communications with intelligence and surveillance authorities, including detailing NRC staff to the Federal Bureau of Investigation's Strategic Information Operations Center to ensure better and more prompt knowledge of immediate potential terrorist threats. The NRC also issued SAs to inform licensees of immediate potential terrorist threats and screened publicly available material for information that might be useful to terrorists. This included shutting down the NRC's public website for one week to perform a review and removing certain documents from the public domain, such as nuclear plant final safety analysis reports and certain emergency planning and fire protection documents.

Shortly after September 11, 2001, the Chairman and the Executive Director for Operations directed that a secure means for communications would be required at each nuclear power plant site. This was done in order to be able to effectively communicate any real-time, classified threat information to Resident Inspectors and cleared licensee personnel. The agency's Information Security Branch accordingly deployed secure telephones and facsimile devices to each Resident Inspector's office. Quarterly testing of these devices is still required to establish proper training and operations of this secure information channel.

Beyond the 9/11 Response: Within a month after the attacks, the NRC began to focus efforts toward long-term measures aimed at regulatory changes to reinforce security at NRC-licensed facilities. With the Department of Energy's national laboratories, the staff launched an examination of the potential for, and consequences of, terrorist attacks like those of 9/11 targeting nuclear facilities. On October 9, 2001, a Response to Terrorist Acts Task Force was set up to develop a "scoping paper," reviewing the NRC's security and safeguards program. The scoping paper proposed a course of action to adjust licensee capabilities to respond to attacks that exceeded the design-basis threat (DBT). On November 28, 2001, the staff submitted the scoping paper, portions of which are classified, proposing ICMs deemed necessary from consequence and vulnerability assessments.

### **Security Reinforcement (2002 to 2007)**

Security Orders (2002-2004): By February 2002, the agency was ready to issue an order to licensees requiring a broad array of ICMs to bolster security, emergency planning, and mitigation strategies. On February 25, 2002, the NRC issued Order EA-02-026, "Interim Security Compensatory Measures for a High Threat Environment," to all nuclear power plant licensees requiring them to take a series of measures by August 31, 2002, to address air, water, and land-based terrorist threats. The order contained an attachment, which is designated Safeguards Information and is not publicly available. This order attachment contained requirements such as reducing a nuclear facility's visual signature from an aircraft attack, augmented security force capability, increased patrols and security posts, additional physical barriers, vehicle checks, improved communication and coordination with law enforcement and military authorities, increased training for security and emergency response personnel, more restrictive access control measures, and enhanced employee background checks. Similar orders were issued for non-power reactor licensees and certificate holders. The agency issued three more security orders over the next year and a half with additional requirements for access authorization, security personnel training and qualification, and additional requirements for licensees to protect against the revised DBT.

The security orders led to a period of frequent interaction with licensees. Some issues were resolved relatively quickly. For example, the NRC approved completely revised physical security plans at each commercial power reactor site by the end of 2004. The revised DBT order required that all plants demonstrate the ability to protect against additional threat characteristics by October 29, 2004. All nuclear power plant licensees met this requirement. In 2006, the Commission published the final rule on the revised DBT in 10 CFR 73.1. In accordance with these regulations, the NRC reviews the threat environment annually to consider adjustments to the DBT.

Accident Mitigation and Emergency Preparedness: Licensees also instituted new mitigation strategies for aircraft threats, as required by Section B.5.a of the attachment to the ICM order. In June 2004, the NRC issued an SA informing licensees of the requirement to submit to the agency their imminent threat procedures.

There was, however, much uncertainty as to how licensees might meet the accident mitigation requirements addressed in the ICM order. Section B.5.b of the order required licensees to adopt mitigation strategies with readily available resources to maintain or restore core cooling, containment, or spent fuel pool capability in the event of fires and explosions from causes, such as aircraft impacts, that exceeded the design basis. Of particular difficulty was reaching agreement on the meaning of "readily available" resources. The staff performed inspections at each site between October 2002 and October 2003 to ensure conformance with the ICMs. Licensee understanding of the requirements of Section B.5.b varied widely. The staff concluded that additional guidance was needed, but achieving consensus on Section B.5.b requirements, their implementation, and NRC inspections took several years.

On August 25, 2004, the Commission directed the staff to create a program of reviews and inspections to implement the mitigation measures required by Section B.5.b for all licensees. The agency opted for a deliberate strategy of implementing Section B.5.b in three phases to develop a consistent set of best practices, apply generic lessons learned from several years of engineering analysis, and identify additional mitigation strategies. In the first phase, the NRC expected licensees to draw on information from existing programs, industry best practices already developed, and generic lessons learned from engineering analysis done since 9/11.

On February 25, 2005, the NRC provided licensees with a guidance document for Phase 1, which is designated Safeguards Information. In Phase 2, the NRC oversaw the industry's analyses of potential impacts of the loss of large areas of the plant. In this phase, the NRC aimed to verify the efficacy of current mitigation measures and identify additional mitigation strategies that relied on existing readily available resources and potential, practical backup capabilities. The NRC responded to public and Congressional interest in the vulnerability of spent fuel pools by creating another phase devoted exclusively to spent fuel pool operations. The NRC devoted much of 2005 and early 2006 to inspections to verify plant compliance with the three phases of Section B.5.b mitigation.

The Nuclear Energy Institute (NEI) issued NEI 06-12, "B.5.b Phase 2 & 3 Submittal Guideline," to provide a methodology for developing mitigating strategies, determining which other strategies might be viable, and assist licensees in closing Phases 2 and 3. In December 2006, the NRC endorsed NEI 06-12 as an acceptable method for meeting Phase 2 and 3 requirements.

In 2007, licensees submitted plans for implementing mitigation strategies. The NRC reviewed these plans and memorialized the requirements in conforming license conditions. The license conditions captured subtle differences between the initial strategies developed using readily available resources and the final strategies, which rely on additional equipment.

Defensive Capability: Force-on-Force Exercises: Before 9/11, the NRC had conducted force-on-force (FOF) exercises at each nuclear power plant approximately once every eight years. Immediately after the attacks, FOF exercises were suspended to avoid diverting attention and resources from the immediate need to maintain security and implement the ICM order.

Between 2002 and 2004, the NRC redesigned the FOF program, testing elements of the program at about two-thirds of the nation's nuclear power plants. In 2002, the NRC started the transition to a new FOF program, with expanded table-top drills followed by expanded FOF exercises. In November 2004, the NRC began its revised FOF Inspection Program that reflected lessons learned from two years of evaluation, as well as inclusion of the expanded adversary characteristics of the revised DBT.

The new inspection program increased the rigor and realism of FOF exercises. The NRC conducts FOF inspections at each nuclear power plant site once every 3 years. The plants also conduct their own drills and FOF exercises on an annual basis. Extensive preparation goes into designing commando-style mock attacks that identify aspects of the plant's protective strategy that could potentially be exploited to enable an adversary to cause a release of radiation.

To ensure realism in FOF exercises, the NRC also worked with industry to create a credible, mock adversary force (MAF) to participate in the exercises. In April 2004, the NRC issued performance standards to the industry for the MAF. The MAF is used for all NEI-member utilities. When NextEra and Entergy decided to discontinue their NEI memberships, they no longer had access to the MAF, and accordingly created a Joint Composite Adversary Force for the conduct of licensee FOF exercises at their sites.

Since the implementation of the modern program in 2004, the FOF inspection program has evolved from three exercises per inspection in the first cycle (2004–2007), to two exercises and a training exercise in the third cycle (2011–2013), to two exercises in the fifth cycle (2017–2019). The programmatic changes are based on the staff's self-assessments required by the reactor oversight process; implementation of inspection program efficiencies; licensees' overall strong performance during exercises; and consideration of the principle of "reasonable assurance of adequate protection."

Communication and Information Control: The NRC confronted the dilemma of enhancing information security while also enabling access to classified and sensitive information by licensee representatives. To address this, the agency upgraded secure communication capabilities, developed a Safeguards Information Designation Guide to ensure consistent designation of such material, and improved controls on access to classified information. In February 2003, the NRC established a protected computer server system for the efficient exchange of sensitive information. The agency has also sponsored several workshops on civilian nuclear security and incident response for Federal and State officials.

The agency also developed the designation Sensitive Unclassified Non-Safeguards Information (SUNSI), which is information not considered Safeguards Information or classified information but is required by regulations to be protected. This category includes a licensee's physical protection and material control program information. During the same period, to enhance the security of radioactive sources, the NRC worked with the International Atomic Energy Agency to identify those sources most attractive to adversaries, and the Commission worked with Agreement State officials to develop controls to ensure source safety and security.

The NRC worked with other Federal agencies to develop and implement the Homeland Security Advisory System, which included a series of color-coded threat level designations. (This system has since been replaced by the National Terrorism Advisory System.) The NRC also provided threat-level guidance tailored to each licensee category through Regulatory Issues Summaries<sup>1</sup> of appropriate protective measures.

Licensee computer systems that support plant operations, including reactor safety equipment, are largely isolated from the internet to preclude outside attacks. Nevertheless, the orders the Commission issued after the 9/11 attacks included requirements to address cyber security threats and plant vulnerabilities. In 2003, the NRC issued the revised DBT order to include requirements to protect against cyber attacks. In 2004 and 2005, the agency published a self-assessment tool for nuclear power plants and the NEI issued guidance that helped licensees develop their cyber security programs. In 2007, the NRC revised regulatory requirements to include a "cyber attack" as an attribute of the DBT and published associated guidance.

NRC Organizational Changes: Before the 9/11 attacks, responsibilities for nuclear security, incident response, and emergency preparedness were divided among several NRC headquarters offices; however, the late-2001 assessment led to the agency's reorganization and expansion of its security and response capability by creating the Office of Nuclear Security and Incident Response (NSIR) in April 2002.

### **Enhanced Security Regulation (2005-present)**

When the 9/11 attacks occurred, the NRC was in the midst of a rulemaking process to streamline physical protection requirements for power reactors, as prescribed in 10 CFR 73.55, through the use of risk insights. In early 2003, once all the post-9/11 orders had been issued, the Commission directed the staff to "use the process of rulemaking for the completion, finalization, and revision, if needed, of further security enhancements for operating power reactors." The Commission further approved a staff recommendation to codify the post-9/11 security order requirements in the regulations to ensure applicability to new power reactors.

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<sup>1</sup> Regulatory issue summaries are used to (1) communicate and clarify NRC technical or policy positions on regulatory matters that have not been communicated to or are not broadly understood by the nuclear industry, (2) inform the nuclear industry of opportunities for regulatory relief, (3) communicate previous NRC endorsement of industry guidance on technical or regulatory matters, (4) provide guidance to applicants and licensees on the scope and detail of information that should be provided in licensing applications to facilitate NRC review, and (5) request the voluntary participation of the nuclear industry in NRC-sponsored pilot programs or the voluntary submittal of information which will assist the NRC in the performance of its functions.

In 2005, the NRC initiated a comprehensive rulemaking to codify orders and incorporate lessons learned from post-9/11 order implementation as directed by the Commission and consistent with the Energy Policy Act of 2005 (EPAAct). The NRC staff's associated evaluation led to changes in the requirements for facility alarm stations, uninterrupted power supplies, "video-capture" capabilities, and security personnel training and qualification. The EPAAct included a provision, sought by the NRC, to allow licensees to use enhanced weapons in protection of their facilities and expanded fingerprint and background checks for security personnel. The law also contained provisions for enhanced FOF exercises and a revision to the DBT.

In 2006, a proposed rulemaking was published for public review and comment, revising 10 CFR Parts 50, 72, and 73 to incorporate the post 9/11 orders, lessons learned, and EPAAct requirements. The proposed major revisions to these regulations included the EPAAct enhanced weapons guidelines, safety (i.e., operations) and security interface requirements, updated notification and reporting requirements, new requirements for securing mixed oxide fuel, cyber security requirements, mitigating strategies for fires, access authorization program requirements, target set requirements, physical security requirements, security personnel training and qualification requirements, and safeguards contingency planning requirements. The final rule that was published on March 27, 2009, did not include the EPAAct enhanced weapons requirements and updated notification and reporting requirements. These requirements are being addressed in a separate rulemaking which the Commission is currently reviewing.

In late 2011, the NRC issued a letter to licensees rescinding the majority of the post-9/11 orders after capturing the requirements of the orders in new regulations and regulatory guides. One order pertaining to operator training remains in effect. Two order requirements on emergency preparedness remain in effect and were reviewed by NRC staff against the final rule, "Enhancements to Emergency Preparedness Regulations," which was published on November 23, 2011. The NRC will rescind these two orders in a future letter.

Aircraft Impact Assessment: The NRC reviewed the assessments completed after the 9/11 attacks and the March 27, 2009, final rule determining that current licensee requirements provided adequate protection to the public from the radiological effects of explosions or fires that might result from an aircraft impact or other causes. For the new generation of large light water reactor designs, the NRC concluded that a greater inherent robustness was needed against aircraft impacts. The NRC's position was consistent with its long-standing policy statement that new nuclear power plant designs must provide an enhanced margin of safety. On June 12, 2009, the NRC issued a new final rule to require applicants for new light water reactors to assess the effects of an aircraft impact and provide design features and functional capabilities to avoid or mitigate the effects of a crash.

Communications and Information Control: The NRC, U.S. Department of Homeland Security, and other Federal and State agencies worked diligently to advance their cooperation, culminating in the development of the National Infrastructure Protection Plan and the Nuclear Sector Specific Plan in 2006 and 2007, respectively. Both plans facilitate information sharing and help coordinate a comprehensive response to threats, man-made accidents, and natural disasters. The Nuclear Sector Specific Plan addresses awareness, prevention, response, and recovery from events by promoting

improved collaboration, communication, security procedures, and risk-informed approaches to achieve nuclear sector resiliency.

In March 2009, the NRC issued a new cyber security rule. This new section of the regulations, "Protection of Digital Computer and Communications Systems and Networks (10 CFR 73.54)," applies to existing nuclear power reactor licensees and those applying for new reactor licenses, requiring licensees and applicants to develop a cyber security plan for NRC approval. The rule, built on the requirements of the ICM order, made the cyber security plans part of the licensing basis for a power reactor in the same manner as other security plans.

In January 2010, the NRC published Regulatory Guide 5.71, which provides comprehensive guidance to licensees and applicants on an acceptable way to meet the requirements of 10 CFR 73.54. NSIR also established the Cyber Assessment Team (CAT), whose mission is to assess cyber events that occur at licensed facilities and review and evaluate the mitigation strategy implemented by the licensee. The CAT coordinates closely with other federal agencies, the industry, and non-governmental entities to maintain overall situational awareness, and to provide mutual assistance in the case of a cyber attack at, or credible cyber threat to, an NRC-licensed facility.

In May 2015, the Commission approved a final rule, 10 CFR 73.77, "Cyber Security Event Notifications," which requires timely notification to the NRC of cyber security events that cause or could cause adverse impacts to safety-related and important-to-safety, security, and emergency preparedness functions. These notifications require nuclear power reactor licensees to notify the NRC within one hour for cyber attacks that adversely impacted their safety, security or emergency response functions and within four hours for cyber attacks that could have adversely impacted those functions.

In November 2010, President Barack Obama issued Executive Order 13556, "Controlled Unclassified Information," to "establish an open and uniform program for managing information that requires safeguarding or dissemination controls." In 2016, the National Archives and Records Administration (NARA) published 32 CFR Part 2002 in the Federal Register (81 FR 63323). The Controlled Unclassified Information (CUI) Rule went into effect on November 14, 2016, establishing requirements for CUI designation, safeguarding, dissemination, marking, decontrolling, destruction, incident management, self-inspection, and oversight across the Executive Branch. On January 19, 2019, the Commission issued SRM-COMSECY-18-0022: Controlled Unclassified Information Rulemaking (ADAMS # ML19022A021), approving the staff's plans to commence a CUI Rulemaking to update the regulations to ensure an adequate transition from the agency's SUNSI program to a CUI program. The proposed rule is currently projected to be delivered to the Commission in Calendar Year 2021.

Accident Mitigation and Emergency Preparedness: On April 30, 2009, the staff informed the Commission that it had completed inspections of all plants for the implementation of Section B.5.b mitigation measures. Once these NRC inspections were completed, the NRC shifted its monitoring to the reactor oversight process.

To provide implementation guidance on the mitigating strategies needs for new reactors, NEI submitted Revision 3 to NEI 06-12, "B.5.b Phase 2 & 3 Submittal Guideline," taking into account design differences from operating reactors. On October 7, 2009, the agency endorsed this revision as an acceptable approach in meeting the mitigation

requirements of 10 CFR 50.54(hh)(2), subject to some clarifications in an Interim Staff Guidance document.

On May 18, 2009, the NRC issued a proposed emergency preparedness rule that incorporated voluntary measures taken by licensees in response to NRC Bulletin 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events." The final rule published in the *Federal Register* on November 23, 2011, addressed security and non-security issues related to emergency planning. The rule added new sections, providing greater direction and capability requirements for emergency responders during a hostile action event. Non-security sections of the final rule addressed requirements for backup means for alert notification, timely emergency declarations, and timely emergency plan changes.

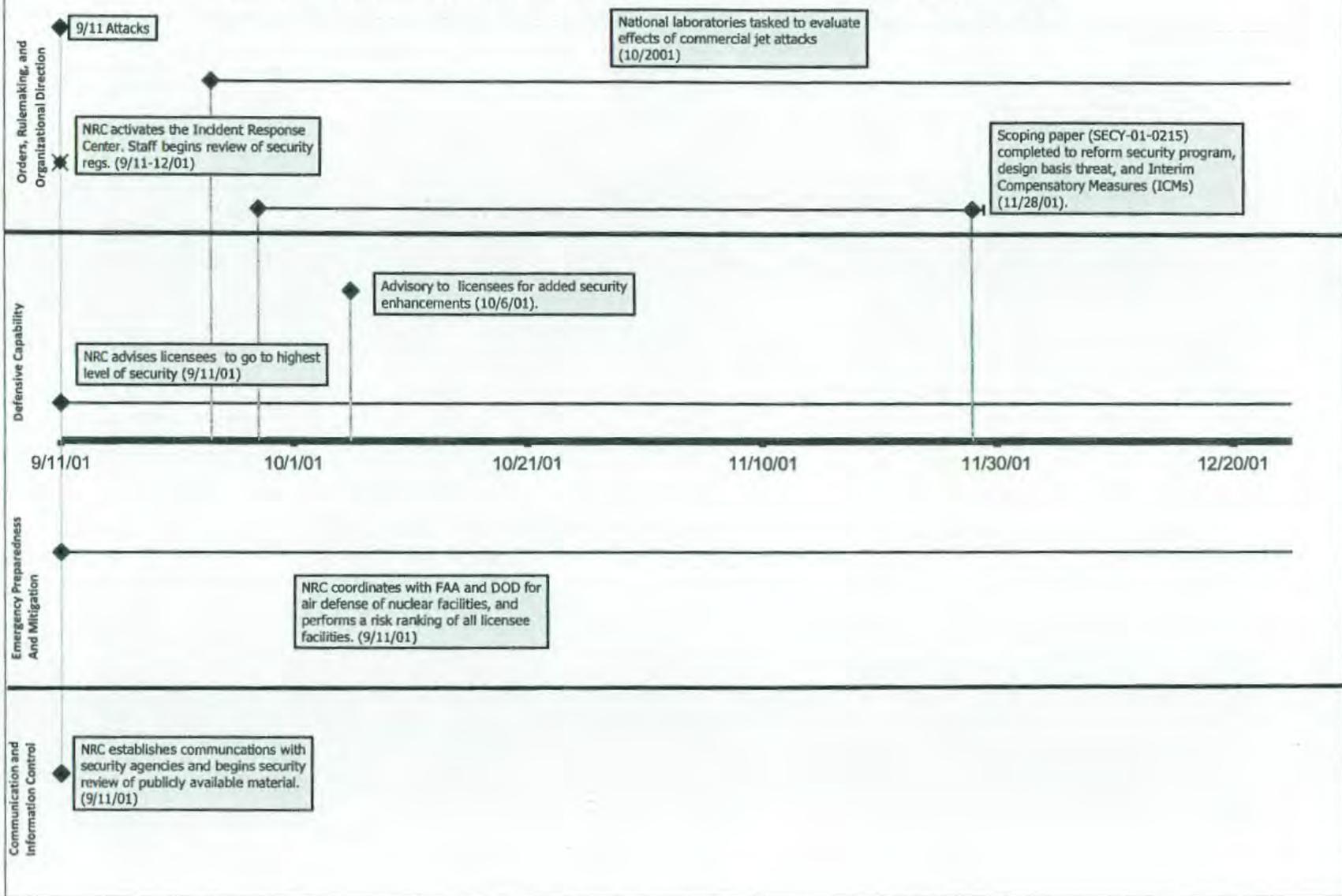
Fukushima and Mitigation: The NRC's post-9/11 regulatory changes have implications for plant safety as well as security. The NRC's requirements for mitigating strategies (i.e., Section B.5.b) recognized the value of addressing threats that exceed the design basis. The NRC concluded that these mitigation strategies could improve safety even for non-terrorist events leading to large fires or explosions.

Events at the Fukushima Daiichi Nuclear Power Station on March 11, 2011, highlighted the potential benefits of the NRC's Section B.5.b mitigating strategies, formalized in 10 CFR 50.54 (hh)(2), for any beyond-design-basis events. In March 2011, following the Fukushima accident, the NRC issued Bulletin 2011-01, "Mitigating Strategies," to licensees and once again verified compliance with the 50.54 (hh)(2) requirements.

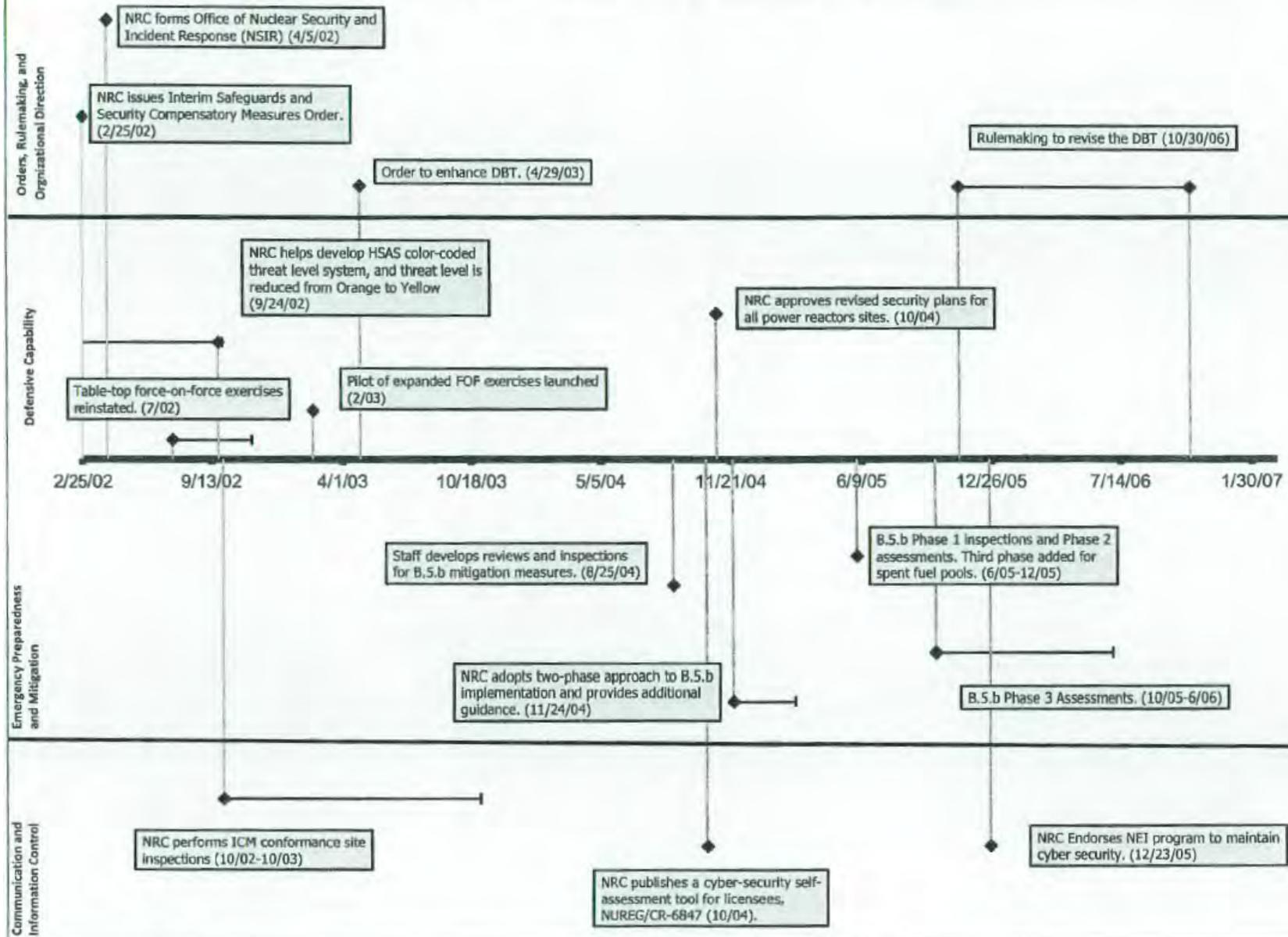
Summary: In the aftermath of the terrorist attacks of 9/11/01, the NRC acted promptly by issuing orders to licensees and certificate holders that required licensees to implement immediate measures to reinforce existing security capabilities. Subsequently, the NRC established NSIR. NSIR staff evaluated licensee compliance with the orders, analyzed independent research activities, and incorporated best practices into rulemakings. The rulemakings included requirements for physical security, cyber security, target sets, access authorization, licensee management of the safety-security interface at facilities, emergency preparedness, and mitigating strategies for aircraft.

The NRC has addressed security within its risk-informed, performance-based regulatory framework to meet the agency's public health and safety mission.

# NRC Since 9/11: Immediate Threat Response



# NRC Since 9/11: Security Reinforcement



# NRC Since 9/11: Enhanced Security Regulation

