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ACCELERATING DEPLOYMENT OF VERSATILE, ADVANCED NUCLEAR FOR CLEAN ENERGY ACT OF 2023

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Mr. CARPER, from the Committee on Environment and
Public Works, submitted the following

R E P O R T

[To accompany S. 1111]

The Committee on Environment and Public Works to which was referred the bill (S. 1111) to enhance United States civil nuclear leadership, support the licensing of advanced nuclear technologies, strengthen the domestic nuclear energy fuel cycle and supply chain, and improve the regulation of nuclear energy, and for other purposes, having considered the same, reports favorably thereon with an amendment in the nature of a substitute and recommends that the bill, as amended, do pass.

GENERAL STATEMENT AND BACKGROUND

Preserving and expanding the nation's use of clean and reliable nuclear energy is essential to advancing the energy and national security interests of the United States and achieving our environmental goals. Currently, America's 94 operating nuclear reactors generate approximately one-fifth of our nation's electricity and nearly half of our carbon-free energy.¹ In addition, new nuclear reactors would provide reliable, diverse, and clean energy to support our nation's electricity system. Thus, the United States must support both continued operation of existing reactors and deploy new advanced reactors to ensure that nuclear generation maintains its important role in America's energy portfolio.

Russia's war on Ukraine and China's aggressive nuclear buildout highlight the importance of American leadership in providing en-

¹World Nuclear Association, *Country Profiles: Nuclear Power in the USA*, <https://world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power.aspx> (last visited January 31, 2024).

ergy security at home and abroad. The international community, particularly American allies, are seeking to deploy new nuclear technologies to reduce reliance on Russian energy, and specifically Rosatom, Russia’s state-owned nuclear enterprise. Exporting American nuclear technologies will grow domestic jobs and fill a vacuum abroad that will likely otherwise be filled by Russia and China. Doing so is good for America’s geostrategic relationships, the U.S. economy and job creation, and safety, security, and nonproliferation standards.

The Committee recognizes the Nuclear Regulatory Commission (NRC) as the international leader for the regulation of the use of radioactive material and nuclear technology. However, the burgeoning interest in the rapid deployment of new reactor concepts presents challenges to the NRC on multiple fronts. Reactor vendors seeking to license designs that depart from traditional light-water reactor technology require the NRC to build and maintain additional technical capacity to meet its statutory licensing and oversight role.

In order to maintain the public’s trust and confidence in its decisions and in the safety regimes that it administers, the NRC must continue to fulfill its safety mission consistent with its obligations as an independent regulator under the Atomic Energy Act of 1954 and the Energy Reorganization Act of 1974.² The Commission should ensure that its licensing and regulatory activities are conducted in a manner designed “to provide reasonable assurance of adequate protection of public health and safety and to promote the common defense and security and to protect the environment”.³ Application of the NRC’s Principles of Good Regulation—Independence, Openness, Efficiency, Clarity, and Reliability—can and should guide the NRC’s execution of its licensing and oversight functions in order to manage any surge in licensing activity.⁴ Nothing in this Act is intended to change those fundamental guideposts in how the agency does its work.

The NRC’s efforts to modernize and prepare for additional licensing activities are critical as nuclear energy is increasingly recognized as a necessary resource to provide baseload, emission-free energy. The NRC is currently engaged in reviewing license applications for first-of-a-kind reactor designs, with several other developers engaged in pre-application discussions.⁵ In addition, the NRC is developing a new regulatory framework for advanced reactors with unprecedented levels of engagement from the industry and the public.⁶ These activities provide significant learning opportunities for the agency and will help better prepare the NRC staff for future applications.

² Atomic Energy Act of 1954, ch. 1073, § 1, 68 Stat. 960 (August 30, 1954); Energy Reorganization Act of 1974, Pub. L. 93–438, Oct. 11, 1974, 88 Stat. 1233 (October 11, 1974).

³ U.S. Nuclear Regulatory Commission, *About NRC: NRC Mission*, <https://www.nrc.gov/about-nrc.html> (last visited January 26, 2024).

⁴ U.S. Department of Energy, *Pathways to Commercial Liftoff: Advanced Nuclear*, Department of Energy, Mar. 2023, <https://liftoff.energy.gov/wp-content/uploads/2023/05/20230320-Liftoff-Advanced-Nuclear-vPUB-0329-Update.pdf>.

⁵ U.S. Nuclear Regulatory Commission, *Status Report on the Licensing Activities and Regulatory Duties of the U.S. Nuclear Regulatory Commission (For the Reporting Period of July 1, 2023 through September 30, 2023)*, <https://www.nrc.gov/docs/ML2327/ML23279A030.pdf>.

⁶ U.S. Nuclear Regulatory Commission, *Part 53—Risk Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors*, <https://www.nrc.gov/reactors/new-reactors/advanced-rulemaking-and-guidance/part-53.html> (last visited January 26, 2024).

S. 1111, the Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act of 2023's (herein referred to as the ADVANCE Act) suite of policies to enable the safe use of nuclear energy will build on the NRC's current initiatives and position the U.S. to compete in international markets. Targeted public funding to support certain licensing activities will unlock further private investment to successfully license and operate new reactors while providing broader public benefits. This targeted support also aims to empower the NRC to modernize and strengthen its regulatory capacity and invest in critical areas of the agency.

Both domestically and abroad, advanced reactor developers envisage novel uses for their designs beyond electricity generation. Many innovative nuclear vendors have expressed intentions to mass-manufacture their designs to achieve economies of scale. Each novel use case and innovative manufacturing or construction practice requires thoughtful consideration to identify and address potential safety and regulatory issues before developers submit applications for licensing. Achieving efficiency in the license review process for advanced reactors requires that agency technical staff possess the knowledge to effectively evaluate the safety of new technologies. Reducing uncertainties through early engagement with potential licensees and coordinated research initiatives will help to build technical capacity to inform licensing reviews.

In addition to addressing anticipated, future needs in developing and deploying new nuclear technologies, the ADVANCE Act also recognizes and addresses issues associated with the federal government's role and legacy in Cold War uranium mining. The environmental and public health impacts of the early atomic age and the legacy of nuclear weapons development continue to impact communities across the nation. The Committee recognizes the federal government's role in remediating these legacy sites and supports steps necessary to clean up those abandoned uranium mines located on Tribal lands.⁷ Additionally, communities that host nuclear power plants that have shut down face a number of negative economic impacts and economic development challenges, which includes the federal government's failure to fulfill its legal obligation to permanently dispose of commercial spent nuclear fuel.

The ADVANCE Act includes provisions that address pressing needs of the NRC and introduces policies that will lay the foundation for advanced reactor deployment in the coming decade. Reinvigorating America's nuclear energy sector will create jobs, strengthen our energy and national security, reduce carbon dioxide emissions, grow our economy, and strengthen strategic domestic supply chains. The ADVANCE Act will help the United States to achieve these goals. This legislation enjoys broad support from the nuclear industry, nonprofit organizations, labor and trade unions, and other stakeholders.⁸

⁷U.S. Environmental Protection Agency, *Navajo Nation: Cleaning Up Abandoned Uranium Mines*, <https://www.epa.gov/navajo-nation-uranium-cleanup/abandoned-mines-cleanup> (last visited January 26, 2024).

⁸Letters of support from the following entities are on file with the Committee: American Nuclear Insurers; American Nuclear Society; ARC Clean Technology; BPC Action; BWX Technologies, Inc.; Center for Climate and Energy Solutions (C2ES); Centrus Energy Corp.; Clean Air Task Force; ClearPath Action; Core Power (US) Energy Northwest; Framatome Inc.; Generation Atomic; Good Energy Collective; International Brotherhood of Boilermakers; International Brotherhood of Electrical Workers (IBEW); Lightbridge Corporation; National Rural Electric Co-

TITLE I—AMERICAN NUCLEAR LEADERSHIP

This title will help to facilitate U.S. leadership in international nuclear energy development in order to compete with Russian and Chinese entities and to partner with nations seeking to deploy nuclear power plants. Countries that currently do not host nuclear reactors are exploring the deployment of nuclear power to help strengthen energy infrastructure. For example, several countries in Africa are looking to deploy nuclear energy.⁹ These emerging civil nuclear energy nations will require financial and technical support to build independent regulatory agencies and develop the institutional, cultural, and safety expertise to deploy civil nuclear energy generation. Establishing a framework for cooperation will position the United States to serve as the international leader in forging new global nuclear partnerships.¹⁰ The NRC has already launched some initiatives to do so. For example, in 2019, the NRC entered into a memorandum of cooperation (MOC) with the Canadian Nuclear Safety Commission (CNSC) to increase collaboration on technical reviews of advanced reactors. This partnership has yielded benefits to both agencies.¹¹

Building on the NRC's MOC with the CNSC, and related international activities, section 101 of the ADVANCE Act directs the NRC to coordinate international activities to support regulatory cooperation with allied countries, as well as countries seeking to establish nuclear regulatory frameworks of their own. The Committee intends that the Commission implement section 101 by coordinating activities relating to both nuclear reactor licensing and oversight, as well as radioactive material regulation. The Committee urges the Commission to establish a single branch to serve as a single coordinating function, but the bill does not prohibit the Commission from reorganizing this coordinating function for international activities in the future. Section 101 of the ADVANCE Act does not confer any new authorities to the Commission beyond the NRC's existing statutory regulatory and licensing authority to serve as an independent safety regulator and its role in approving certain export licenses, as generally conducted under 10 C.F.R. Part 110.

To counter Russian influence in nuclear fuel markets and the impacts to domestic nuclear fuel manufacturing capacity, the ADVANCE Act restricts the possession in the United States of nuclear fuel that is fabricated by Russian or Chinese entities.¹² While fully fabricated fuel from such sources is not currently used by domestic nuclear power facilities, this provision will provide a backstop au-

operative Association; The Nature Conservancy; Nuclear Energy Institute; Nuclear Innovation Alliance; Oklo; Orano USA; Radiant Industries; TerraPower; Terrestrial Energy USA; Third Way; Urenco USA; U.S. Chamber of Commerce; U.S. Nuclear Industry Council; Xcel Energy; and X-Energy, LLC.

⁹ Atoms for Africa, The Breakthrough Institute (Apr. 18, 2018), <https://thebreakthrough.org/articles/atoms-for-africa>.

¹⁰ See, e.g., Atlantic Council, *U.S. Nuclear Energy Leadership: Innovation and The Strategic Global Challenge* (May 2019), <https://www.atlanticcouncil.org/wp-content/uploads/2019/05/US-Nuclear-Energy-Leadership.pdf>.

¹¹ U.S. Nuclear Regulatory Commission, *Memorandum of Cooperation Between the Canadian Nuclear Safety Commission (CNSC) and the NRC*, <https://www.nrc.gov/reactors/new-reactors/advanced/who-were-working-with/international-cooperation/nrc-cnsc-moc.html> (last visited January 26, 2024).

¹² U.S. Department of Energy, *Restoring America's Competitive Nuclear Energy Advantage*, https://www.energy.gov/sites/default/files/2020/04/f74/Restoring%20America%27s%20Competitive%20Nuclear%20Advantage_1.pdf.

thority to ensure domestic fuel fabricators will not be subject to market manipulation by foreign, state-sponsored entities. Section 102 requires the Secretary of Energy and the Secretary of State to make a joint determination whether possession of nuclear fuel that is fabricated for commercial power reactors in Russia or China poses a threat to the national security of the United States. The Committee does not intend the ADVANCE Act to be interpreted as an outright prohibition on such covered fuel, but the Committee does intend to ensure that the potential use of Russian or Chinese fabricated fuel is carefully considered on a case-by-case basis.

Section 103 requires the Commission to deny issuance of an export license for certain nuclear material and technology to countries that have not signed the International Atomic Energy Agency (IAEA) safety and security protocols if the Commission finds that transfer of such technology is inimical to United States' national interests. The Committee does not intend to establish a new standard that differs from the current inimicality requirements under the Atomic Energy Act; rather it intends only to reiterate the NRC's existing export approval threshold. However, as the United States seeks to expand its international cooperation to ensure the safe development of civil nuclear energy, Federal agencies charged with executing and overseeing non-proliferation polices must ensure that the deployment of all nuclear technologies intended for peaceful civilian power uses do not contribute to proliferation. To assist Congress in understanding the extent and nature of exports to those countries, the Commission must notify Congress if the NRC determines that an export license for a covered item to a covered country is not inimical to the common defense and security of the United States. The Committee intends that the Commission notify Congress promptly upon making such a determination.

TITLE II—DEVELOPING AND DEPLOYING NEW NUCLEAR TECHNOLOGIES

Title II consists of targeted solutions to address certain challenges associated with the licensing of advanced reactor technology, the use of such technology in novel applications, and the deployment of advanced reactors.

The Omnibus Reconciliation Act of 1990 (OBRA-90) directed the NRC to recover approximately 90 percent of its annual budget through fees charged to licensees and applicants.¹³ Congress revised OBRA-90's method to calculate the NRC's fee-recovery requirements as part of the 2019 Nuclear Energy Innovation and Modernization Act (NEIMA).¹⁴ NEIMA requires the NRC to charge a fee for a thing of service or value; this is done through developing a fee rate that is assessed and collected on an hourly basis and charged under 10 C.F.R. Part 170.¹⁵ To calculate the total hourly rate, the NRC allocates the total budgetary resources into three bins—mission-direct, mission-indirect, and agency support. Those categories are then applied to establish fees within certain business

¹³ Omnibus Reconciliation Act of 1990, Pub. L. 101-508, Title VI, Subtitle B, 104. Stat. 1388-298 (November 5, 1990).

¹⁴ Nuclear Energy Innovation and Modernization Act, Pub. L. 115-439, Title I, Sec. 102, 132 Stat. 5567 (Jan. 14, 2019).

¹⁵ The balance of NRC's fee-recovered budget is spread amongst NRC licensees and paid as annual charges under 10 C.F.R. § 171.

lines.¹⁶ The NRC's professional hourly rate under Part 170 for Fiscal Year (FY) 2023 is \$300 per hour.¹⁷

Efficient license reviews depend on the quality of interaction between the NRC staff and applicants, especially when applicants submit designs for advanced reactors reliant on novel safety features with which the industry has minimal operating experience. The NRC also consistently encourages robust pre-application engagement as a mechanism to improve NRC staff familiarity with designs and the efficiency of eventual license reviews. ADVANCE Act section 201 amends NEIMA's existing fee-recovery requirements to reduce fees assessed to advanced nuclear reactor applicants and pre-applicants. For some nuclear energy vendors, especially those seeking to license very small nuclear power systems, the current rate under NEIMA is burdensome.¹⁸ The ADVANCE Act reduces the total charges for advanced reactor applicants and pre-applicants to just mission-direct costs. In other words, an advanced reactor applicant would only pay for the costs of the NRC staff that are directly reviewing the application, which should result in higher quality engagement between an applicant and NRC reviewers. That methodology would reduce the total hourly rate from \$300 per hour in FY 2023 to approximately \$145.¹⁹ The revised hourly rate calculation does not limit Congress from modifying established budget control points in future appropriations bills.

To ensure that hourly fees not attributed to mission-direct work are not simply shifted to other portions of the NRC's fee-base, the ADVANCE Act excludes mission-indirect and agency support costs from NEIMA's fee recovery requirements. The Committee intends that the estimated projected costs for mission-indirect and agency support costs are included in the NRC's annual *Congressional Budget Justification* and are a component of requested congressional appropriations.

The ADVANCE Act establishes a sunset date of September 30, 2029 for the reduced hourly rate for pre-applicants. This time limitation is intended to encourage advanced nuclear companies to prioritize resources to engage with the NRC in the near-term to receive licenses for first-of-a-kind designs. A sunset date also minimizes the need for additional congressional appropriations in the long-term.

Section 202 authorizes a new Department of Energy (DOE) prize program to reward first-mover advanced reactor applicants. The prize program is intended to incentivize advanced nuclear developers to dedicate additional private capital funding and resources to deploy the first advanced reactors and pave the way for subsequent reactor deployment. The prize categories reflect the Committee's broad interest in facilitating new nuclear energy technologies, including a reactor for nonelectric applications, a reactor that reuses spent nuclear fuel, and the first advanced reactor licensed

¹⁶ U.S. Nuclear Regulatory Commission, *FY 2023 Final Fee Rule Work Papers* (May 15, 2023), <https://www.nrc.gov/docs/ML2313/ML23136A575.pdf>.

¹⁷ Revision of Fee Schedules; Fee Recovery for Fiscal Year 2023, 88 Fed Reg 39,120 (June 15, 2023).

¹⁸ Nuclear Innovation Alliance, *Unlocking Advanced Nuclear Innovation* p. 17, <https://www.nuclearinnovationalliance.org/unlocking-advanced-nuclear-innovation-role-fee-reform-and-public-investment>.

¹⁹ *Id.*

under the NRC’s new technology-inclusive regulatory framework known as Part 53. Under the prize eligibility requirements, an entity may only be eligible to receive the prize once the reactor is licensed and has received regulatory approval to operate. The bill authorizes a total prize amount that equals the total regulatory costs the eligible entity paid to the NRC under NEIMA’s fee-recovery requirements. Because section 201 of the ADVANCE Act reduces the hourly rate charged under Part 170 for advanced reactor applicants, the Committee expects the total prize amount will be lower than existing fee costs. This will minimize the total impact on the DOE’s total appropriation. The manager’s amendment adopted at the Committee’s markup clarifies that should the Tennessee Valley Authority (TVA) receive a prize, the prize’s funding would not be subject to TVA-specific funding requirements. The ADVANCE Act limits the award amount to costs that exceed existing statutory cost-share requirements. Expenditures that are necessary to meet those cost-share requirements are not eligible to be counted towards the overall award amount to ensure that the entity is not using prize funding to subsidize its cost-share obligations. The Committee expects that the DOE will implement the awards program under this section in conjunction with, and, to the maximum extent practicable, within the same organizational structure as, the Advanced Nuclear Energy Licensing Cost-Share Grant Program.

In 2021, the industrial sector was the third largest source of greenhouse gas emissions at approximately 23 percent of total U.S. greenhouse gas emissions.²⁰ Reducing emissions in the industrial sector presents unique challenges compared with decarbonization steps for the transportation or electric sectors, but nuclear designs may present emissions-free solutions.²¹ Section 203 directs the Commission to analyze and report on the unique licensing and other requirements associated with non-electric applications of nuclear reactors to provide greater transparency on the regulatory issues associated with the use of advanced nuclear technologies to reduce industrial emissions. For example, the NRC may need to consider a number of regulatory issues associated with co-locating a licensed reactor with an industrial facility, such as physical security or emergency preparedness.

Congress has previously directed the DOE and the Department of Defense (DOD) to pursue the deployment of advanced nuclear reactors on DOE and DOD sites.²² If the DOE and DOD determine there is a national security or reliability need to construct and operate a nuclear reactor on such a site, the NRC may ultimately serve as the regulator. Under existing requirements, Congress would appropriate money to one federal agency—the DOE or DOD—which then would award such funding to a private entity to work through the regulatory process with the NRC—another federal agency. Each step of the funding process costs money to manage and oversee. Thus, the dollar amount that is eventually paid

²⁰ U.S. Environmental Protection Agency, *Sources of Greenhouse Gas Emissions: Industry Sector Emissions*, <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#industry> (last visited Jan. 29, 2024).

²¹ See, e.g., U.S. Department of Energy, *3 Surprising Ways to Use Nuclear Energy*, <https://www.energy.gov/ne/articles/3-surprising-ways-use-nuclear-energy> (last visited Jan. 29, 2024).

²² See, e.g., John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. 115–232, Title III, Subtitle C, Sec. 327, 132 Stat. 1721 (Aug. 13, 2018).

to the NRC in fees is far less than the original amount appropriated to the DOE or DOD for that purpose. Section 204 reduces this inefficiency by providing a direct pathway for Congress to appropriate money to the NRC for early site permit work at a qualifying site. The limited portion of the total licensing process that the NRC is authorized to undertake subject to appropriations is intended to be a targeted approach, still allowing the DOE and DOD to broadly fund other licensing work, such as funding appropriated to the DOE's licensing cost-share program established by the Nuclear Energy Innovation and Capabilities Act (NEICA).²³

Nuclear fusion has the potential to provide safe, clean baseload energy needed to power our cities and industries, while generating important economic and national security benefits. The pace of innovation in fusion has dramatically accelerated over the last decade, with the United States at the forefront. Currently, there are more than a dozen private sector companies seeking to commercialize fusion energy in the near term, and many of these companies are vying to demonstrate net energy and net electricity production by the middle of the decade. Further, leading scientists from around the world have determined that fusion does not pose safety concerns similar to fission.²⁴ Unlike fission, fusion does not use or generate fissile material, raises minimal proliferation concerns, and systems can be turned off on demand. The Commission unanimously voted to direct the regulation of fusion energy systems under the NRC's byproduct materials framework (10 C.F.R. Parts 30–37).²⁵ Section 205 clarifies that this regulatory framework should be established on a separate path from the NRC's current efforts associated with the technology-inclusive framework for nuclear fission.

Electric utilities, states, and communities are examining options to site nuclear facilities on brownfield sites or sites with retiring fossil-fuel energy plants to achieve emissions-reduction goals and provide dispatchable, baseload electricity. The DOE has investigated the potential for the reuse of such sites in ways that leverage existing energy infrastructure at coal plants while delivering economic and environmental benefits to communities impacted by the energy transition.²⁶ The NRC does not have experience licensing reactors on brownfield sites. Section 206 of the ADVANCE Act instructs the NRC to consider the legal and regulatory implications of co-locating advanced reactors at former fossil energy and brownfields sites and to include any potential interagency coordination needed to perform effective and efficient environmental reviews. The Commission should assess the potential site characteris-

²³ Nuclear Energy Innovation and Capabilities Act of 2017, Pub. L. 115–248, Sec. 3, 132 Stat. 3160 (Sept. 28, 2018).

²⁴ See, e.g., National Academies of Sciences, *Bringing Fusion to the U.S. Grid*, at 42 (2021), <https://nap.nationalacademies.org/catalog/25991/bringing-fusion-to-the-us-grid> (“Fusion power plants cannot have a chain reaction. As a result, safety issues associated with fusion are different from those associated with fission reactors”); U.K. Atomic Energy Authority, *Technology Report—Safety and Waste Aspects for Fusion Power Plants* (Sept. 2021), <https://scientific-publications.ukaea.uk/wp-content/uploads/UKAEA-RE2101-Fusion-Technology-Report-Issue-1.pdf>.

²⁵ Nuclear Regulatory Commission, *Staff Requirements—SECY-23-0001—Options for Licensing and Regulating Fusion Energy Systems* (Apr. 13, 2023), <https://www.nrc.gov/docs/ML2310/ML23103A449.pdf>.

²⁶ U.S. Department of Energy, *Investigating Benefits and Challenges of Converting Retiring Coal Plants into Nuclear Plants* <https://fuelcycleoptions.inl.gov/SiteAssets/SitePages/Home/C2N2022Report.pdf>.

tics that could be utilized to expedite the safe licensing of a facility on a brownfield site, such as considering previously completed environmental documents and data, as well as addressing issues that could be problematic, such as increased background radiation associated with coal ash ponds or how liability issues may need to be addressed. The Committee intends that information gathered during the development of the Commission’s report will serve as a roadmap to utilize brownfield sites. The NRC is subsequently directed to update appropriate strategies and regulations to enable the timely licensing review for utilization and production facilities at brownfield and retired fossil-fuel sites.

As certain states that have traditionally relied on fossil-fuel energy sources look to replace retiring electric generation, nuclear energy is of growing interest. For example, in 2017, Kentucky lifted its moratorium on nuclear power plants, and in 2022, West Virginia similarly eliminated its longstanding prohibition. Other states in the Appalachian Regional Commission’s footprint are considering ways to facilitate coal-to-nuclear replacement projects.²⁷ Section 207 intends to help to build technical capability for states that do not have significant experience with nuclear energy. It is intended to assist entities by engaging with the NRC to understand how the NRC licenses, regulates, and oversees nuclear facilities.

TITLE III—PRESERVING EXISTING NUCLEAR ENERGY GENERATION

The global nuclear energy market has transformed since many of America’s civil nuclear energy bedrock laws were enacted. For example, at the outset of the commercial nuclear age and prior to the development of a globally integrated market that exists today, Congress codified a policy to prohibit meaningful foreign participation in America’s nuclear energy market.²⁸ This policy restricts the NRC from licensing a nuclear reactor that is owned by a foreign entity, regardless of the country. This restriction prevents the United States’ closest allies from operating commercial nuclear power plants, limiting long-term energy security and national security geostrategic relationships. Section 301 of the ADVANCE Act modifies this legacy policy.²⁹ The bill removes the blanket prohibition on the NRC from issuing a license to an entity that is owned, controlled, or dominated by an alien, foreign corporation, or foreign government. The bill lifts the blanket ban with regard to entities from countries belonging to the Organization for Economic Co-operation and Development (OECD) and the Republic of India.

While section 301 lifts the outright moratorium for entities from those countries, it does not require the NRC to issue a license to such entities and preserves a full, robust Executive Branch review. For example, the ADVANCE Act does not eliminate a review from the Committee on Foreign Investment in the United States. Under the revised provision, the Commission must still determine if issuing a license is inimical to the interests of the United States.

²⁷ See, e.g., World Nuclear News, *Maryland and X-energy to Examine Coal-to-Nuclear Switch* (June 15, 2022), <https://www.world-nuclear-news.org/Articles/Maryland-and-X-energy-to-study-coal-to-nuclear-swi>.

²⁸ Atomic Energy Act of 1954 § 103(d), 42 U.S.C. § 2133(d).

²⁹ For more information, see Matt Bowen, Columbia University Center on Global Policy, *Strengthening Nuclear Energy Cooperation Between the United States and Its Allies* (July 2020), https://www.energypolicy.columbia.edu/wp-content/uploads/2020/07/NuclearAllies_CGEP-Report_111522.pdf.

The Commission should interpret the phrase “owned, controlled, or dominated” with respect to a foreign entity to mean that the final parent entity that has ultimate and final decision-making control over the applicant, notwithstanding any intermediate entities between the applicant and the final parent entity.

Title III also extends the financial protection and backstop financial indemnification policy for nuclear power licensees, known as the “Price-Anderson Act” (PAA),³⁰ first established in 1957. Prior to receiving a license to operate a nuclear power reactor, the applicant must demonstrate that it has the necessary insurance liability coverage to meet the PAA requirements. If Congress does not extend the PAA beyond the current expiration on December 31, 2025,³¹ licensing of advanced reactors would be imperiled. Therefore, the ADVANCE Act extends this liability protection by 20 years.

TITLE IV—NUCLEAR FUEL CYCLE, SUPPLY CHAIN, INFRASTRUCTURE, AND WORKFORCE

Title IV introduces policies to modernize elements of the nuclear fuel cycle and address issues across the supply chain for advanced reactors.

Due to a lack of new nuclear reactors deployed in the past 30 years, the nuclear industry has not adopted or utilized new manufacturing and construction techniques that are widely prevalent in other industries. Advances in manufacturing and construction processes hold the potential to reduce deployment costs and timelines, improve reactor assembly flexibility, and increase safety.³² For example, Oak Ridge National Laboratory demonstrated a new 3D printing process that could manufacture materials for use in a nuclear reactor.³³ The lack of nuclear construction has also negatively impacted the nuclear supply chain. However, the codes and standards that are used for other major infrastructure projects, such as the American Petroleum Institute specifications for the design, sourcing, and manufacture of safety-critical equipment or the American National Standards Institute’s ISO 9001 standard,³⁴ could also be used in the nuclear industry. This would increase the number of eligible component manufacturers and suppliers, reduce costs, increase schedule certainty, leverage best practices across related industries, and maintain safety. Section 401 of the ADVANCE Act directs the NRC to consider unique licensing issues or requirements for the use of advanced manufacturing processes and advanced construction techniques. The Committee intends for the NRC to survey and identify non-nuclear codes and standards that could be adopted to enable the deployment of advanced reactors. The report should also update the Committee on work related to

³⁰ 42 U.S.C. § 2210.

³¹ Congress extended PAA coverage to December 31, 2025 in the Energy Policy Act of 2005.

³² See, e.g., Joseph Simon, Oak Ridge National Laboratory, *Additive Manufacturing to Nuclear Reactor Core Components* at 1 (May 31, 2019), <https://info.ornl.gov/sites/publications/Files/Pub126700.pdf>.

³³ U.S. Department of Energy, *BWXT and ORNL Demonstrate New 3d Printing Process for High Temperature Materials*, <https://www.energy.gov/ne/articles/bwxt-and-ornl-demonstrate-new-3d-printing-process-high-temperature-materials> (last visited Jan. 31, 2024).

³⁴ American Petroleum Institute, *API Standards: International Usage and Deployment*, <https://www.api.org/-/media/apiwebsite/products-and-services/api-international-usage-and-deployment-report-2022.pdf>; American National Standards Institute, *ISO 9001: 20015 Quality Management Systems Standard* (Feb. 10, 2020), https://blog.ansi.org/iso-9001-2015-quality-management-standard/?_gl=1*11kpiel*_gcl_au*MjAwNjU1OTIwOS4xNzA2NjMwOTE5.

factory production of reactor modules, including the utilization of manufacturing licenses, licensing considerations for initial fuel loading of reactor modules in a factory setting, and the transfer of fueled reactor modules between licensees. The NRC should consider manufacturing and construction issues associated with fusion reactors, which are included in NEIMA’s definition of advanced reactors, as part of the report.

A strong and safe domestic nuclear energy sector also requires a competent well-trained workforce. Nuclear energy advocates have identified the need to grow the nuclear workforce as a critical step to facilitate a robust nuclear supply chain.³⁵ To help achieve this goal, the ADVANCE Act creates a subprogram under the NRC’s existing University Nuclear Leadership Program (UNLP) to require the NRC to coordinate with institutions of higher learning and trade schools to anticipate and meet critical nuclear workforce needs. While the bill provides additional direction and responsibilities to the Commission, the Committee does not intend for this provision to weaken or dilute NRC’s existing UNLP programs.

The federal government has not fulfilled its legal obligations to take title to and dispose of commercial spent nuclear fuel and high-level waste. The data required in section 404 will help Congress better understand the DOE’s ongoing costs and liabilities associated with nuclear waste management and better inform future nuclear waste policy decisions.

Section 405 of the ADVANCE Act authorizes the EPA Administrator to create a parallel structure to the EPA’s Superfund authorities to prioritize remediation of contaminated sites on Tribal land. The Committee intends for the EPA to prioritize Navajo Nation sites contaminated by legacy uranium mining undertaken as a result of contracts with the Atomic Energy Commission (AEC) to support the United States’ atomic energy defense programs.³⁶ However, the section does not prohibit the EPA Administrator from using this authority for similar sites that meet the criteria established under this section. The number of contaminated uranium sites on Tribal land are significant and will require substantial resources to mitigate potential ongoing damage to Tribal members’ health and economic wellbeing. The EPA is encouraged to prioritize site remediation activities that will make significant improvements to protect public health and the environment. The Committee encourages the EPA to utilize new technologies that can remediate these sites in a more efficient and cost-effective manner.

The Committee recognizes the initial successes of the research coordination for advanced reactor demonstrations between the NRC and DOE implemented under NEICA. This framework served as a model for section 406 of the ADVANCE Act, which aims to enhance interagency coordination between the NRC and DOE relating to the development and qualification of new fuel technologies, including accident tolerant fuels. Providing opportunities for direct observation of DOE research activities under this arrangement has delivered significant benefits to both DOE researchers and the NRC

³⁵ See, e.g., Alan Ahn and Ryan Norman, Third Way, *Revitalizing America’s Nuclear Energy Supply Chain* (May 25, 2022), <https://www.thirdway.org/blog/revitalizing-americas-nuclear-energy-supply-chain>.

³⁶ U.S. Environmental Protection Agency *et al.*, *Ten Year Plan: Federal Actions to Address Impacts of Uranium Contamination on the Navajo Nation 2020–2029*, <https://www.epa.gov/sites/default/files/2021-02/documents/nnaum-ten-year-plan-2021-01.pdf>.

staff.³⁷ The Committee intends that the advanced nuclear fuel initiative established pursuant to section 405 will reduce the length of time and streamline the process to qualify and license advanced nuclear fuels.

TITLE V—IMPROVING COMMISSION EFFICIENCY

Competent, highly qualified, and specialized staff are critical for the NRC to fulfill its mission. Recent reports have consistently identified staff hiring and retention issues as a major challenge for the agency to efficiently license and regulate nuclear material.³⁸ Workforce challenges have also been identified as a potential hurdle to enable the deployment of advanced nuclear reactors.³⁹

Congress has long recognized the need for specialized expertise to license and regulate the civilian use of radioactive materials. Section 161d of the Atomic Energy Act provided the AEC—the NRC’s and DOE’s predecessor agency—with authority to “appoint and fix the compensation of such officers and employees as may be necessary to carry out the functions of the Commission, and that such authority may be made without regard to civil service laws as the Commission deemed such action necessary to the discharge of its responsibilities.”⁴⁰ This authority, carried forward through the Energy Reorganization Act of 1974’s separation of the regulatory responsibilities to the NRC and DOE’s promotional role, allows the NRC to use its personnel authorities outside of Office of Personnel Management requirements. However, the NRC’s recent persistent staffing challenges make clear that the NRC’s use of this authority has been inadequate.

To address this challenge, the ADVANCE Act provides specific hiring authority to the NRC to onboard highly specialized individuals and well-qualified candidates to meet the workforce needs of the Commission. This section also authorizes the Commission to offer competitive salaries and bonuses to target and attract the specific technical competencies required for mission critical activities. The new direct hire authority and nuclear energy traineeship program aim to bolster recruitment efforts already underway at the NRC. Offering competitive compensation and benefits, as well as further development of the Nuclear Regulator Apprenticeship Network, will help attract highly skilled workers to carry out the agency’s important work now and into the future.

The Reorganization Plan No. 1 of 1980 directs the Chairman to delegate to the Executive Director for Operations (EDO) general oversight and management of the NRC staff under the Chairman’s

³⁷ See, e.g. Ashley Finan, Idaho National Laboratory, *National Reactor Innovation Center Advance Construction Technology Initiative* (Mar. 16, 2023), <https://www.nrc.gov/docs/ML2305/ML23055B142.pdf>.

³⁸ See, e.g., *Hearing on the Oversight of NRC: Ensuring Efficient and Predictable Nuclear Safety Regulation for a Prosperous America: Hearing Before the House Energy and Commerce Subcommittee on Energy, Climate, and Grid Security*, 118th Cong. (June 14, 2023) (Mr. Veasey, “So, what additional support does the NRC need from Congress to aid the effective and efficient review of advanced reactor technologies?” Chair Hanson, “Congressman, I guess I would kind of focus on two things. One is just additional hiring authorities so we have got that flexibility in the way we bring people on. It is not to say that we need a lot more people, necessarily. I have—I think I have been pretty consistent in saying that we both need to bring new people into the agency and also change the way we work.”)

³⁹ U.S. Government Accountability Office, *Nuclear Power: NRC Needs to Take Additional Actions to Prepare to License Advanced Reactors* at 24–27 (July 2023), <https://www.gao.gov/assets/d23105997.pdf>.

⁴⁰ Atomic Energy Act of 1954 § 161(d).

“direction and supervision.”⁴¹ Consistent with this existing authority, section 501(f) directs the Chairman to delegate the use of the hiring and compensation authority. The Committee expects the Chairman will be ultimately responsible for how this additional authority is executed. Further, the Committee intends that, consistent with the Reorganization Plan, the Chairman and the EDO will keep the Commission fully and currently informed with regard to the use of the hiring and compensation authorities provided under section 501.

As noted in section 501(b)(3)(C), the Committee intends that the NRC utilize the additional hiring authority to recruit highly specialized or exceptionally well-qualified individuals for all levels of NRC staffing—not just senior-level positions. Integrating new staff throughout different offices and at various levels should strengthen the NRC’s overall organizational health. The new authority is not limited to the hiring and compensation authorities’ specifically listed positions, but the Committee intends that positions filled under this section are associated with the fulfilling of the licensing and regulatory oversight mission of the Commission. It is the Committee’s expectation that specific projects, potentially first-of-a-kind reactor designs or reviews that may require additional attention due to critical public interest, would be good candidates to use the term-limited appointments.

Annual budget requirements imposed by NEIMA have limited the NRC’s ability to quickly adapt to shifting workforce needs and to modernize its information technology infrastructure.⁴² To address these challenges, the ADVANCE Act amends the limitations on corporate support costs to give more flexibility to the NRC to fund initiatives that provide indirect benefits to the agency’s mission critical activities. Section 502 amends the corporate support spending caps and definition under NEIMA by limiting the cap to 30 percent of the NRC’s annual budget and removing certain activities from the calculation of corporate support costs.

The Committee is concerned that the Commission did not consistently meet previously established corporate support limitations.⁴³ Based on projected growth in licensing activities, the Committee expects the Commission’s budget authority will grow in coming years. Revising the cap to 30 percent should assist the agency in near-term budget allocation. Because the cap is set as a proportion of total budget authority, if the increase in licensing and regulatory work materializes as expected, the Commission should strictly adhere to this revised cap.

Section 102(c) of NEIMA directed the Commission to develop performance metrics and milestone schedules for requested activities of the Commission. Since the required generic schedules were established on July 16, 2019, the NRC has not modified a single generic milestone. Additionally, according to the NRC, these generic

⁴¹ Reorganization Plan No. 1 of 1980, 45 Fed. Reg. 40,561 (June 16, 1980).

⁴² U.S. Nuclear Regulatory Commission, *Nuclear Energy Innovation and Modernization Act (NEIMA)—Implementation, Impacts, and Recommendations for Improvement of the U.S. Nuclear Regulatory Commission’s Annual Budget Justification; Fees and Charges; Performance and Reporting; and Accurate Invoicing* p. 6–8, <https://www.nrc.gov/docs/ML2123/ML21237A033.pdf>.

⁴³ In FY24, NRC’s corporate support was approximately 30.2 percent of total budget authority. In FY23, corporate support was approximately 31 percent of total budget authority. In FY22 corporate support was approximately 30 percent of total budget authority and FY22 was the only year NRC reached the NEIMA cap. In FY21, corporate support was approximately 31 percent of total budget authority.

milestone schedules are achieved for nearly every licensing action.⁴⁴ Section 503 of the ADVANCE Act requires the Commission to periodically review previously established metrics and milestones to be as reasonably efficient as possible. The Committee intends for the updated metrics and milestones to be more ambitious than the existing timeframes. Generic milestones and metrics that are reached nearly 100 percent of the time should not be characterized as “as reasonably efficient as possible.”

TITLE VI—MISCELLANEOUS

Title VI creates a grant program through the U.S. Department of Commerce’s Economic Development Administration to provide economic development assistance and funding for community advisory panels in communities affected by a nuclear power plant closure. These communities suffer significant financial and economic impacts through the loss of tax revenue and jobs following plant closures.⁴⁵ Furthermore, these communities currently bear the responsibility of hosting spent nuclear fuel storage facilities in the absence of action by the Federal government to provide for consolidated storage or permanent disposal.

OBJECTIVES OF THE LEGISLATION

The objectives of S. 1111, the ADVANCE Act, are to enable the development and deployment of nuclear energy technologies to support the nation’s energy needs with reliable and diverse electric generation, and to reduce emissions. The bill seeks to: enhance United States global leadership in nuclear energy; encourage deployment of new nuclear energy technologies; help preserve the existing domestic fleet of nuclear power plants; strengthen the domestic nuclear fuel cycle and supply chain infrastructure; fund environmental cleanup of legacy abandoned mining sites on Tribal lands; and improve Nuclear Regulatory Commission (NRC) performance and workforce capacity.

SECTION-BY-SECTION ANALYSIS

SECTION 1. SHORT TITLE; TABLE OF CONTENTS

Sec. 1. Short title; table of contents

This section gives the Act the short title of the “Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act of 2023” or “ADVANCE Act of 2023” and provides the table of contents.

Sec. 2. Definitions

This section defines the terms used in this Act.

⁴⁴ See U.S. Nuclear Regulatory Commission, *supra* note 2, at 28, 29.

⁴⁵ See, for example, *A Legislative Hearing to Examine S. 2372, The American Nuclear Infrastructure Act of 2021, and S. 190, the Stranded Act of 2021: Hearing Before the S. Comm. on Environment and Public Works.*, 117th Cong. (February 9, 2022) (testimony of Mayor David Knabel), <https://www.epw.senate.gov/public/index.cfm/hearings?ID=CE32DD15-15E1-4729-94FD-FF1D7250D836>.

TITLE I—AMERICAN NUCLEAR LEADERSHIP

Sec. 101. International nuclear reactor export and innovation activities

This section requires the Nuclear Regulatory Commission (Commission) to coordinate all work of the Commission relating to: (1) nuclear reactor import and export licensing; and (2) international regulatory cooperation and assistance relating to nuclear reactors.

The Commission must also coordinate international activities with respect to the establishment of: (1) certain technical standards; (2) nuclear regulatory organizations and legal frameworks; and (3) exchange programs and training to other countries. The section further provides that the Commission's fee recovery requirements do not apply to these activities.

The Commission is authorized to establish the International Nuclear Reactor Export and Innovation Branch within the Commission's Office of International Programs.

Sec. 102. Denials of certain domestic licenses for national security purposes

This section defines "covered fuel" as enriched uranium that is fabricated into fuel assemblies by an entity that is: (1) owned or controlled by Russia or China; or (2) organized under the laws of Russia or China. The section prohibits the possession or ownership of covered fuel, unless the Commission specifically authorizes such possession or ownership.

This section also directs the Commission to notify the Secretary of Energy and Secretary of State within 30 days of receipt of an application to possess or own covered fuel. The Commission may not issue a license if the Secretary of Energy and Secretary of State jointly determine, within 180 days, that possession or ownership of covered fuel poses a threat to the national security of the United States.

Sec. 103. Export license requirements

This section ensures advanced nuclear technologies approved for export are in compliance with nonproliferation standards.

Sec. 104. Coordinated international engagement

This section requires the Secretary of Commerce and Secretary of Energy to establish an initiative to modernize civil nuclear outreach to embarking civil nuclear energy nations. Qualifying nations are nations that do not have a civil nuclear program, are developing or expanding a civil nuclear program, or are pursuing the development of advanced nuclear reactor technology, and which are not listed in this section as excluded from the qualification.

The initiative requires the Secretary of Commerce to: (1) coordinate outreach to the private investment community to create public-private financing relationships to help to export civil nuclear technology to embarking civil nuclear energy nations; (2) coordinate the work of the Executive Branch; and (3) improve the regulatory framework for exporting and importing of items under the jurisdiction of the Secretary of Commerce.

The initiative requires the Secretary of Energy to: (1) assist non-governmental organizations and Federal agencies to provide edu-

cation and training to foreign governments for nuclear safety, security and safeguards; (2) assist the International Atomic Energy Agency to expand support to embarking civil nuclear energy nations for nuclear safety, security, and safeguards; and (3) assist U.S. nuclear energy companies to integrate security and safeguards into their international outreach.

TITLE II—DEVELOPING AND DEPLOYING NEW NUCLEAR TECHNOLOGIES

Sec. 201. Fees for advanced nuclear reactor application review

This section amends the Nuclear Energy Innovation and Modernization Act to set a specific rate for fees assessed and charged to an entity that has: (1) submitted to the Commission a license application for an advanced nuclear reactor; or (2) submitted to the Commission a licensing project plan describing pre-application activities for a future license application for an advanced nuclear reactor. The revised rate for pre-application activities sunsets on September 30, 2029.

The rate equals the hourly rate calculated by the Commission for mission-direct program salaries and benefits for the nuclear reactor safety program. Mission-indirect program support and agency support expenses that would otherwise be charged to the applicant are excluded from the Commission's fee recovery requirements.

Sec. 202. Advanced nuclear reactor prizes

This section authorizes the Secretary of Energy to award a prize in an amount equal to the fees assessed by the Commission for activities related to the review and approval of the first operating license or combined operating license with a finding issued pursuant to 10 C.F.R. 52.103g for an advanced nuclear reactor issued to a non-Federal entity or the Tennessee Valley Authority.

The Secretary is authorized to make additional awards for the first advanced reactor that: (1) uses isotopes derived from spent nuclear fuel as fuel for the reactor; (2) is part of a nuclear integrated energy system; (3) is used for nonelectric application; or (4) is licensed under the new technology-inclusive regulatory framework required by the Nuclear Energy Innovation and Modernization Act.

An eligible entity that receives an award is not required to repay that award or pay a dividend or interest on the award.

Sec. 203. Report on unique licensing considerations relating to the use of nuclear energy for nonelectric applications

This section directs the Commission to submit a report to Congress, not later than nine months after the date of enactment, identifying unique licensing issues or requirements related to the: (1) flexible operation of nuclear reactors; (2) use of nuclear reactors for nonelectric applications; and (3) colocation of nuclear reactors with industrial plants or other facilities.

Nonelectric applications include hydrogen or other liquid and gaseous fuel or chemical production; water desalination and wastewater treatment; heat for industrial processes; district heating; energy storage; industrial or medical isotope production; and other applications identified by the Commission.

Sec. 204. Enabling preparations for the demonstration of advanced nuclear reactors on Department of Energy sites or critical national security infrastructure sites

This section provides that the Commission's fee recovery requirements do not apply to costs of pre-application proceedings relating to an early site permit or the review of an early site permit associated with advanced nuclear reactor demonstrations to be located on DOE or critical national security infrastructure sites.

Sec. 205. Clarification on fusion regulation

This section amends the Nuclear Energy Innovation and Modernization Act to exclude fusion reactors from the technology-inclusive regulatory framework for advanced nuclear fission reactors.

Sec. 206. Regulatory issues for nuclear facilities at brownfield sites

This section directs the Commission to identify and report on regulations, guidance, or policy necessary to license and oversee nuclear facilities at brownfield sites, including sites with retired fossil fuel facilities. The Commission must consider how existing site infrastructure can be reused and how early site permits, plant parameter envelopes, or standardized applications for similar sites may be used in licensing nuclear facilities at brownfield sites.

The Commission must also develop and implement strategies or initiate a rulemaking to enable and support the licensing of nuclear facilities at brownfield sites. The Commission shall consider: existing site infrastructure; existing emergency preparedness organizations and planning; the availability of historical site-specific environmental data; previously approved environmental reviews; potential decommissioning activities; and community engagement and experience with energy production.

Sec. 207. Appalachian Regional Commission nuclear energy development

This section authorizes the Appalachian Regional Commission to provide assistance to individuals or entities in the Appalachian region to: (1) conduct research to support siting, constructing, and operating a nuclear facility at a brownfield site; (2) assist with workforce training or retraining for a nuclear facility at a brownfield site; and (3) engage with the Commission, the DOE, and other Federal agencies.

This section authorizes \$5 million per year for fiscal years 2023 through 2026 to carry out this program.

TITLE III—PRESERVING EXISTING NUCLEAR ENERGY GENERATION

Sec. 301. Investment by allies

This section allows certain foreign entities to receive a license described in sections 103(d) or 104(d) of the Atomic Energy Act of 1954 for a nuclear utilization facility if the Commission determines that issuing such license is not inimical to the common defense and security or the health and safety of the public. This section applies to: (1) an entity that is owned, controlled, or dominated by the Republic of India or a government of a country that is a member of Organisation for Economic Co-operation and Development on the

date of enactment; (2) a corporation that is incorporated in those countries; or (3) an alien who is a national of those countries.

An entity that has been subject to sanctions under the Countering America's Adversaries Through Sanctions Act is still subject to the existing licensing prohibition.

Sec. 302. Extension of the Price-Anderson Act

This section extends section 170 of the Atomic Energy Act of 1954, commonly known as the Price-Anderson Act, from the current expiration date of December 31, 2025, to December 31, 2045.

TITLE IV—NUCLEAR FUEL CYCLE, SUPPLY CHAIN, INFRASTRUCTURE,
AND WORKFORCE

Sec. 401. Report on advanced methods of manufacturing and construction for nuclear energy applications

This section directs the Commission to submit a report to Congress, not later than 180 days after the date of enactment, on licensing and safety issues for innovative nuclear energy applications related to manufacturing and construction.

Sec. 402. Nuclear energy traineeship

This section establishes a new traineeship subprogram under the University Nuclear Leadership Program to provide focused training to meet critical mission needs of the Commission and other nuclear workforce needs relating to nuclear safety and tradecraft.

Sec. 403. Report on Commission readiness and capacity to license additional conversion and enrichment capacity to reduce reliance on uranium from Russia

This section directs the Commission to submit a report to Congress, not later than 180 days after the date of enactment, on the readiness and capacity of the Commission to license additional conversion and enrichment capacity and fuel cycle facilities to reduce reliance on Russian nuclear fuel.

The report must analyze how the Commission's capacity to license additional conversion and enrichment capabilities at new and existing fuel cycle facilities may restrict the Commission's readiness to review advanced nuclear reactor applications.

Sec. 404. Annual report on the spent nuclear fuel and high-level radioactive waste inventory in the United States

This section directs the Secretary of Energy to annually submit a report to Congress that describes the annual and cumulative payments made by the United States to the holder of a standard contract due to a partial breach of the contract under the Nuclear Waste Policy Act of 1982⁴⁶ resulting in financial damages to the holder. The report must also quantify the amount spent to reduce projected legal payments, account for actions taken in the prior fiscal year with respect to interim storage, and describe activities to develop and deploy technologies and fuels that enhance the safe transportation and storage of spent nuclear fuel and high-level radioactive waste.

⁴⁶42 U.S.C. 10101 *et seq.*

Sec. 405. Authorization of appropriations for superfund actions at abandoned mining sites on Tribal land

This section authorizes appropriations for the Administrator of the Environmental Protection Agency (EPA) to conduct response actions, including removal and remedial planning activities, studies and other actions taken pursuant to Superfund authorities at abandoned mine land on Tribal land. It also authorizes appropriations for the Administrator to conduct remedial and removal actions under Superfund at similarly located eligible non-National Priorities List sites and sites listed on the National Priorities list. This section also directs the Agency for Toxic Substances and Disease Registry to perform health assessments at each eligible non-National Priority List site located on Tribal land.

The Administrator may provide financial assistance to Tribal governments and other specified Tribal entities. Grant funds may be used for technical assistance or response actions.

The Administrator shall coordinate with any applicable Indian Tribe when selecting and prioritizing sites and carrying out response actions.

Sec. 406. Development, qualification, and licensing of advanced nuclear fuel concepts

This section directs the Commission to establish an initiative to enhance preparedness and coordination to qualify and license advanced nuclear fuel.

The Commission must, within 180 days of enactment, enter into a memorandum of understanding with the Secretary of Energy to: (1) share technical expertise and knowledge to support the testing and safety analysis of advanced nuclear fuel; and (2) ensure that DOE and the Commission have sufficient technical expertise and facilities to support the evaluation of regulatory approval for advanced nuclear fuel.

The Commission must, within one year of enactment, submit a report to Congress on the Commission's preparedness to review and qualify advanced nuclear fuels, activities undertaken under the memorandum of understanding, necessary research, and other challenges or considerations with respect to advanced nuclear fuels.

TITLE V—IMPROVING COMMISSION EFFICIENCY

Sec. 501. Commission workforce

This section authorizes the appointment, without regard to the civil service laws, of up to 15 permanent positions for fiscal year 2024 and 10 permanent positions for each fiscal year thereafter with highly specialized scientific, engineering, and technical competencies and 15 term-limited positions for fiscal year 2024 and 10 term-limited positions for each fiscal year thereafter for the same competencies. It also authorizes the appointment of 15 permanent positions for fiscal year 2024 and 10 permanent positions for each fiscal year thereafter to be filled by exceptionally well-qualified individuals necessary to fulfill the mission of the Commission and 15 term-limited positions for fiscal year 2024 and 10 term-limited positions for each fiscal year thereafter for the same exceptionally well-qualified individuals. The positions appointed under this section may receive hiring bonuses. The hiring authority under this section

is to be used to fill entry, mid, and senior levels of positions to the extent practicable.

This section also allows the Commission to establish and fill positions compensated at the basic rate of pay equal to level III of the Executive Schedule for up to 10 positions per fiscal year, not to exceed 50 positions total, with highly specialized scientific, engineering, and technical competencies, and up to 10 positions per fiscal year, not to exceed 50 positions total, to be filled by exceptionally well-qualified individuals necessary to fulfill the mission of the Commission. Employees who demonstrate exceptional performance may receive a one-time performance bonus no less frequently than once every six years.

In filling these positions and awarding the one-time performance bonus, the Commission must follow the Merit Systems Principles in section 2301 of title 5 of the United States Code to the maximum extent practicable.

The Commission must delegate the authority under this subsection to establish and fill positions to the Executive Director for Operations, pursuant to the Reorganization Plan No. 1 of 1980.

The Commission must annually report on the total number and positions of persons appointed and compensated, including the use of one-time performance bonuses, under the authority provided in this section. The annual report must also include an assessment of critical workforce needs, other skillsets necessary for the Commission, and plans to assess, develop, and implement staff performance standards, training procedures, and schedules.

Not later than September 30, 2032, the Commission must submit a report to Congress with the Commission's views on the effectiveness of the authorities in this section and make recommendations with respect to whether the authorities provided should be continued, modified, or discontinued.

Section 502. Commission corporate support funding

This section directs the Commission to submit a report to Congress, not later than three years after the date of enactment, describing: (1) the Commission's implementation of the budgetary authority caps for corporate support established under section 102(a)(3) of the Nuclear Energy Innovation and Modernization Act (42 U.S.C. 2215(a)(3)); and (2) whether the Commission is meeting and is expected to meet the total caps under that section.

This section also freezes corporate support limitations at 30 percent and excludes costs associated with unused office space or for salaries, travel, and support of the Office of the Commission from the corporate support cost definition.

Section 503. Performance and reporting update

This section requires the Commission to periodically review and assess performance metrics and milestone schedules. The Commission must revise the metrics and schedules to be the most efficient as is reasonably achievable.

TITLE VI — MISCELLANEOUS

Section 601. Nuclear closure communities

This section authorizes appropriations for the Secretary of Commerce to establish a grant program to assist with economic development and fund community advisory boards in communities impacted by a nuclear power plant that, as of the date of enactment, has ceased or plans to cease operations.

Sec. 602. Technical correction

This section makes a technical correction to the Atomic Energy Act to permit the Commission to issue a license for a research and test reactor if not more than 75 percent of the annual costs to the licensee of owning and operating the facility are devoted to the sale of non-energy services, energy services, or a combination of non-energy services and energy services.

Sec. 603. Report on engagement with the Government of Canada with respect to nuclear waste issues in the Great Lakes Basin

This section requires the Commission to submit a report to Congress describing any engagement between the Commission and the Government of Canada with respect to nuclear waste issues in the Great Lakes Basin.

LEGISLATIVE HISTORY

On March 30, 2023, Senator Shelley Moore Capito, Ranking Member of the Committee, introduced S. 1111, the Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act of 2023 (ADVANCE Act). Senator Tom Carper, Chair of the Committee, Senator Whitehouse, and Senators Barrasso, Crapo, Booker, Graham, Kelly, Risch, and Heinrich joined as original cosponsors of the legislation. Additional cosponsors include Committee members Senators Cardin, Lummis, Ricketts, Ranking Member of the Committee's Subcommittee on Clean Air, Climate, and Nuclear Safety, Cramer, and Wicker as well as non-Committee members Senators Sinema, Coons, Warner, Gillibrand, and Manchin.

HEARINGS

In the 117th Congress, the Committee held a legislative hearing on February 9, 2022, entitled, “A Legislative Haring to Examine S. 2373, the American Nuclear Infrastructure Act of 2021, and S. 1290, the STRANDED Act of 2021.” The purpose of this hearing was to allow committee members to consider stakeholder testimony regarding two pieces of legislation within the Committee's jurisdiction related to nuclear energy and materials. In the 116th Congress, the Committee on Environment and Public Works held a legislative hearing on August 5, 2020, entitled “Hearing to Examine a Discussion Draft Bill, S. , American Nuclear Infrastructure Act of 2020.” These hearings informed the development of the ADVANCE Act.

COMMITTEE CONSIDERATION AND ROLL CALL VOTES

On May 31, 2023, the Committee met to consider S. 1111. During the business meeting, the Committee approved by voice vote with

a quorum present an amendment in the nature of a substitute offered by Chairman Carper and Ranking Member Capito.

The Committee on Environment and Public Works reported the bill, as amended, favorably by a roll call vote of 16 ayes and 3 nays. Voting in favor were Senators Carper, Capito, Cardin, Whitehouse, Kelly, Padilla, Fetterman, Stabenow, Boozman, Wicker, Graham, Ricketts, Lummis, Sullivan, Cramer, and Mullin. Voting against were Senators Markey, Merkley, and Sanders.

REGULATORY IMPACT STATEMENT

In compliance with section 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee finds that S. 1111 does not create any additional regulatory burdens, nor will it cause any adverse impact on the personal privacy of individuals.

MANDATES ASSESSMENT

In compliance with the Unfunded Mandates Reform Act of 1995 (UMRA; Public Law 104-4), the Committee finds that S. 1111 contains no intergovernmental or private-sector mandates as defined in UMRA and would impose costs on state, local, or Tribal governments.

COST OF LEGISLATION

The Congressional Budget Office estimate of the cost of S. 1111 has been requested but was not received at the time the report was filed. When available, the Chairman will request that it be printed in the Congressional Record for the advice of the Senate.

CHANGES IN EXISTING LAW

In compliance with section 12 of rule XXVI of the Standing Rules of the Senate, changes in existing law made by the bill as reported are shown as follows: Existing law proposed to be omitted is enclosed in [black brackets], new matter is printed in *italic*, existing law in which no change is proposed is shown in roman:

Nuclear Energy Innovation and Modernization Act

* * * * *

SECTION 1. [42 U.S.C. 2011 note] SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.— This Act may be cited as the “Nuclear Energy Innovation and Modernization Act”.

* * * * *

SEC. 3. [42 U.S.C. 2215 note] DEFINITIONS.

In this Act:

(1) ADVANCED NUCLEAR REACTOR.—* * *

* * * * *

(2) *Advanced nuclear reactor applicant.*—*The term ‘advanced nuclear reactor applicant’ means an entity that has submitted to the Commission an application to receive a license for an ad-*

vanced nuclear reactor under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.).

[(2)] (3) **ADVANCED NUCLEAR REACTOR FUEL.**—The term “advanced nuclear reactor fuel” means fuel for use in an advanced nuclear reactor or a research and test reactor, including fuel with a low uranium enrichment level of not greater than 20 percent.

(4) *Advanced nuclear reactor pre-applicant.*—The term ‘advanced nuclear reactor pre-applicant’ means an entity that has submitted to the Commission a licensing project plan for the purposes of submitting a future application to receive a license for an advanced nuclear reactor under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.)

(5) *Agency support.*—The term ‘agency support’ means the resources of the Commission that are located in executive, administrative, and other support offices of the Commission, as described in the document of the Commission entitled ‘FY 2022 Final Fee Rule Work Papers’ (or a successor document).

[(3)] (6) **AGREEMENT STATE.**—The term “Agreement State” means any State with which the Commission has entered into an effective agreement under section 274 b. of the Atomic Energy Act of 1954 (42 U.S.C. 2021(b)).

[(4)] (7) **APPROPRIATE CONGRESSIONAL COMMITTEES.**—The term “appropriate congressional committees” means the Committee on Environment and Public Works of the Senate and the Committee on Energy and Commerce of the House of Representatives.

[(5)] (8) **COMMISSION.**—The term “Commission” means the Nuclear Regulatory Commission.

[(6)] (9) **CONCEPTUAL DESIGN ASSESSMENT.**— **[(The term)]**

(A) *In general.*—The term

(B) *Exclusions.*—The term ‘corporate support costs’ does not include—

(i) costs for rent and utilities relating to any and all space in the Three White Flint North building that is not occupied by the Commission; or

(ii) costs for salaries, travel, and other support for the Office of the Commission.”. “conceptual design assessment” means an early-stage review by the Commission that—

(A) assesses preliminary design information for consistency with applicable regulatory requirements of the Commission;

(B) is performed on a set of topic areas agreed to in the licensing project plan; and

(C) is performed at a cost and schedule agreed to in the licensing project plan.

[(7)] (10) **CORPORATE SUPPORT COSTS.**—The term “corporate support costs” means expenditures for acquisitions, administrative services, financial management, human resource management, information management, information technology, policy support, outreach, and training, as those categories are described and calculated in Appendix A of the Congressional Budget Justification for Fiscal Year 2018 of the Commission.

(11) *Hourly rate for mission-direct program salaries and benefits for the nuclear reactor safety program.*—The term ‘hourly

rate for mission-direct program salaries and benefits for the Nuclear Reactor Safety Program’ means the quotient obtained by dividing—

(A) the full-time equivalent rate (within the meaning of the document of the Commission entitled ‘FY 2022 Final Fee Rule Work Papers’ (or a successor document)) for mission-direct program salaries and benefits for the Nuclear Reactor Safety Program (as determined by the Commission) for a fiscal year; by

(B) the productive hours assumption for that fiscal year, determined in accordance with the formula established in the document referred to in subparagraph (A) (or a successor document).

[(8)] (12) LICENSING PROJECT PLAN.—The term “licensing project plan” means a plan that describes—

(A) the interactions between an applicant and the Commission; and

(B) project schedules and deliverables in specific detail to support long-range resource planning undertaken by the Commission and an applicant.

(13) Mission-direct program salaries and benefits for the nuclear reactor safety program.—The term ‘mission-direct program salaries and benefits for the Nuclear Reactor Safety Program’ means the resources of the Commission that are allocated to the Nuclear Reactor Safety Program (as determined by the Commission) to perform core work activities committed to fulfilling the mission of the Commission, as described in the document of the Commission entitled ‘FY 2022 Final Fee Rule Work Papers’ (or a successor document).

(14) Mission-indirect program support.—The term ‘mission-indirect program support’ means the resources of the Commission that support the core mission-direct activities for the Nuclear Reactor Safety Program of the Commission (as determined by the Commission), as described in the document of the Commission entitled ‘FY 2022 Final Fee Rule Work Papers’ (or a successor document).

[(9)] (15) REGULATORY FRAMEWORK.— The term “regulatory framework” means the framework for reviewing requests for certifications, permits, approvals, and licenses for nuclear reactors.

[(10)] (16) REQUESTED ACTIVITY OF THE COMMISSION.—The term “requested activity of the Commission” means—

(A) the processing of applications for—

- (i) design certifications or approvals;
- (ii) licenses;
- (iii) permits;
- (iv) license amendments;
- (v) license renewals;
- (vi) certificates of compliance; and
- (vii) power uprates; and

(B) any other activity requested by a licensee or applicant.

[(11)] (17) RESEARCH AND TEST REACTOR.—

(A) IN GENERAL.— The term “research and test reactor” means a reactor that—

(i) falls within the licensing and related regulatory authority of the Commission under section 202 of the Energy Reorganization Act of 1974 (42 U.S.C. 5842); and

(ii) is useful in the conduct of research and development activities as licensed under section 104 c. of the Atomic Energy Act (42 U.S.C. 2134(c)).

(B) EXCLUSION.— The term “research and test reactor” does not include a commercial nuclear reactor.

[(12)] (18) SECRETARY.—The term “Secretary” means the Secretary of Energy.

[(13)] (19) STANDARD DESIGN APPROVAL.—The term “standard design approval” means the approval of a final standard design or a major portion of a final design standard as described in subpart E of part 52 of title 10, Code of Federal Regulations (as in effect on the date of enactment of this Act).

[(14)] (20) TECHNOLOGY-INCLUSIVE REGULATORY FRAMEWORK.—The term “technology-inclusive regulatory framework” means a regulatory framework developed using methods of evaluation that are flexible and practicable for application to a variety of reactor technologies, including, where appropriate, the use of risk-informed and performance-based techniques and other tools and methods.

[(15)] (21) TOPICAL REPORT.—

SEC. 102. NUCLEAR REGULATORY COMMISSION USER FEES AND ANNUAL CHARGES FOR FISCAL YEAR 2021 AND EACH FISCAL YEAR THEREAFTER.

(a) ANNUAL BUDGET JUSTIFICATION.—

(1) IN GENERAL.— * * *

* * * * *

(3) LIMITATION ON CORPORATE SUPPORT COSTS.—With respect to the annual budget justification submitted to Congress, corporate support costs, to the maximum extent practicable, shall not exceed the following percentages of the total budget authority of the Commission requested in the annual budget justification:

(A) 30 percent for each of fiscal years 2021 and 2022.

[(B) 29 percent for each of fiscal years 2023 and 2024.]

[(C) 28 percent for fiscal year 2025 and each fiscal year thereafter.]

(B) 30 percent for fiscal year 2024 and each fiscal year thereafter.

(4) *International nuclear reactor export and innovation activities.*—*The Commission shall identify in the annual budget justification international nuclear reactor export and innovation activities described in section 101(a) of the ADVANCE Act of 2023.*

* * * * *

(b) FEES AND CHARGES.—

(1) ANNUAL ASSESSMENT.—

(A) IN GENERAL.—* * *

* * * * *

(B) EXCLUDED ACTIVITIES DESCRIBED.— The activities referred to in subparagraph (A)(ii) are the following:

(i) Any fee relief activity, as identified by the Commission.

(ii) * * *

* * * * *

(iii) Costs for activities related to the development of regulatory infrastructure for advanced nuclear reactor technologies, including activities required under section 103.

(iv) *Costs for international nuclear reactor export and innovation activities described in section 101(a) of the ADVANCE Act of 2023.*

(v) *The total costs of mission-indirect program support and agency support that, under paragraph (2)(B), may not be included in the hourly rate charged for fees assessed to advanced nuclear reactor applicants.*

[(vi) The total costs of mission-indirect program support and agency support that, under paragraph (2)(C), may not be included in the hourly rate charged for fees assessed to advanced nuclear reactor pre-applicants.]

(vi) *Costs for—*

(I) *activities to review and approve or disapprove an application for an early site permit (as defined in section 52.1 of title 10, Code of Federal Regulations (or a successor regulation)) to demonstrate an advanced nuclear reactor on a Department of Energy site or critical national security infrastructure (as defined in section 327(d) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232; 132 Stat. 1722)) site; and*

(II) *pre-application activities relating to an early site permit (as defined in section 52.1 of title 10, Code of Federal Regulations (or a successor regulation)) to demonstrate an advanced nuclear reactor on a Department of Energy site or critical national security infrastructure (as defined in section 327(d) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232; 132 Stat. 1722)) site.*

[(2) FEES FOR SERVICE OR THING OF VALUE.—In accordance with section 9701 of title 31, United States Code, the Commission shall assess and collect fees from any person who receives a service or thing of value from the Commission to cover the costs to the Commission of providing the service or thing of value.]

(2) *Fees for service or thing of value.—*

(A) *In general.—In accordance with section 9701 of title 31, United States Code, the Commission shall assess and collect fees from any person who receives a service or thing of value from the Commission to cover the costs to the Commission of providing the service or thing of value.*

(B) *Advanced nuclear reactor applicants.—The hourly rate charged for fees assessed to advanced nuclear reactor applicants under this paragraph relating to the review of a submitted application described in section 3(1) shall not*

exceed the hourly rate for mission-direct program salaries and benefits for the Nuclear Reactor Safety Program.

(C) Advanced nuclear reactor pre-applicants.—The hourly rate charged for fees assessed to advanced nuclear reactor pre-applicants under this paragraph relating to the review of submitted materials as described in the licensing project plan of an advanced nuclear reactor pre-applicant shall not exceed the hourly rate for mission-direct program salaries and benefits for the Nuclear Reactor Safety Program.

(c) PERFORMANCE AND REPORTING.—

(1) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Commission shall develop for the requested activities of the Commission—

- (A)** performance metrics; and
- (B)** milestone schedules.

(2) DELAYS IN ISSUANCE OF FINAL SAFETY EVALUATION.—The Executive Director for Operations of the Commission shall inform the Commission of a delay in issuance of the final safety evaluation for a requested activity of the Commission by the completion date required by the performance metrics or milestone schedule under paragraph (1) by not later than 30 days after the completion date.

(3) DELAYS IN ISSUANCE OF FINAL SAFETY EVALUATION EXCEEDING [180] 90 days.—If the final safety evaluation for the requested activity of the Commission described in paragraph (2) is not completed by the date that is [180]90 days after the completion date required by the performance metrics or milestone schedule under paragraph (1), the Commission shall submit to the appropriate congressional committees a timely report describing the delay, including a detailed explanation accounting for the delay and a plan for timely completion of the final safety evaluation.

(4) Periodic updates to metrics and schedules.—

(A) Review and assessment.—*Not less frequently than once every 3 years, the Commission shall review and assess, based on the licensing and regulatory activities of the Commission, the performance metrics and milestone schedules established under paragraph (1).*

(B) Revisions.—*After each review and assessment under subparagraph (A), the Commission shall revise and improve, as appropriate, the performance metrics and milestone schedules described in that subparagraph to provide the most efficient metrics and schedules reasonably achievable.*

* * * * *

(f) EFFECTIVE DATE.—Except as provided in subsection (c), this section takes effect on October 1, 2020.

(g) CESSATION OF EFFECTIVENESS.—Paragraphs (1)(B)(vi) and (2)(C) of subsection (b) shall cease to be effective on September 30, 2029.

SEC. 103. ADVANCED NUCLEAR REACTOR PROGRAM.

(a) [42 U.S.C. 2133 note] LICENSING.—

(1) STAGED LICENSING.—* * *

* * * * *

(4) TECHNOLOGY-INCLUSIVE REGULATORY FRAMEWORK.—【Not later】

(A) *In general.*—Not later than December 31, 2027, the Commission shall complete a rulemaking to establish a technology-inclusive, regulatory framework for optional use by commercial advanced nuclear reactor applicants for new reactor license applications.

(B) *Exclusion of fusion reactors.*—For purposes of subparagraph (A), the term ‘advanced reactor applicant’ does not include an applicant seeking a license for a fusion reactor.

(f) Prizes for Advanced Nuclear Reactor Licensing.—

(1) *Definition of eligible entity.*—In this subsection, the term ‘eligible entity’ means—

(A) a non-Federal entity; and

(B) the Tennessee Valley Authority.

(2) Prize for advanced nuclear reactor licensing.—

(A) *In general.*—Notwithstanding section 169 of the Atomic Energy Act of 1954 (42 U.S.C. 2209) and subject to the availability of appropriations, the Secretary is authorized to make, with respect to each award category described in subparagraph (C), an award in an amount described in subparagraph (B) to the first eligible entity—

(i) to which the Commission issues an operating license for an advanced nuclear reactor under part 50 of title 10, Code of Federal Regulations (or successor regulations), for which an application has not been approved by the Commission as of the date of enactment of this subsection; or

(ii) for which the Commission makes a finding described in section 52.103(g) of title 10, Code of Federal Regulations (or successor regulations), with respect to a combined license for an advanced nuclear reactor—

(I) that is issued under subpart C of part 52 of that title (or successor regulations); and

(II) for which an application has not been approved by the Commission as of the date of enactment of this subsection.

(B) *Amount of award.*—An award under subparagraph (A) shall be in an amount equal to the total amount assessed by the Commission and collected under section 102(b)(2) from the eligible entity receiving the award for costs relating to the issuance of the license described in that subparagraph, including, as applicable, costs relating to the issuance of an associated construction permit described in section 50.23 of title 10, Code of Federal Regulations (or successor regulations), or early site permit (as defined in section 52.1 of that title (or successor regulations)).

(C) *Award categories.*—An award under subparagraph (A) may be made for—

(i) the first advanced nuclear reactor for which the Commission—

(I) issues a license in accordance with clause (i) of subparagraph (A); or

- (II) makes a finding in accordance with clause (ii) of that subparagraph;
- (ii) an advanced nuclear reactor that—
- (I) uses isotopes derived from spent nuclear fuel (as defined in section 2 of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101)) or depleted uranium as fuel for the advanced nuclear reactor; and
- (II) is the first advanced nuclear reactor described in subclause (I) for which the Commission—
- (aa) issues a license in accordance with clause (i) of subparagraph (A); or
- (bb) makes a finding in accordance with clause (ii) of that subparagraph;
- (iii) an advanced nuclear reactor that—
- (I) is a nuclear integrated energy system—
- (aa) that is composed of 2 or more co-located or jointly operated subsystems of energy generation, energy storage, or other technologies;
- (bb) in which not fewer than 1 subsystem described in item (aa) is a nuclear energy system; and
- (cc) the purpose of which is—
- (AA) to reduce greenhouse gas emissions in both the power and nonpower sectors; and
- (BB) to maximize energy production and efficiency; and
- (II) is the first advanced nuclear reactor described in subclause (I) for which the Commission—
- (aa) issues a license in accordance with clause (i) of subparagraph (A); or
- (bb) makes a finding in accordance with clause (ii) of that subparagraph;
- (iv) an advanced reactor that—
- (I) operates flexibly to generate electricity or high temperature process heat for nonelectric applications; and
- (II) is the first advanced nuclear reactor described in subclause (I) for which the Commission—
- (aa) issues a license in accordance with clause (i) of subparagraph (A); or
- (bb) makes a finding in accordance with clause (ii) of that subparagraph; and
- (v) the first advanced nuclear reactor for which the Commission grants approval to load nuclear fuel pursuant to the technology-inclusive regulatory framework established under subsection (a)(4).
- (3) Federal funding limitations.—
- (A) Exclusion of TVA funds.—In this paragraph, the term ‘Federal funds’ does not include funds received under the power program of the Tennessee Valley Authority.
- (B) Limitation on amounts expended.—An award under this subsection shall not exceed the total amount expended (excluding any expenditures made with Federal funds received for the applicable project and an amount equal to the minimum cost-share required under section

988 of the Energy Policy Act of 2005 (42 U.S.C. 16352)) by the eligible entity receiving the award for licensing costs relating to the project for which the award is made.

(C) Repayment and dividends not required.—Notwithstanding section 9104(a)(4) of title 31, United States Code, or any other provision of law, an eligible entity that receives an award under this subsection shall not be required—

- (i) to repay that award or any part of that award; or
- (ii) to pay a dividend, interest, or other similar payment based on the sum of that award.

* * * * *

CH. 145—REGULATORY MEASUREMENT

TITLE 46—[SHIPPING]

* * * * *

Subtitle II—[VESSELS AND SEAMEN]

* * * * *

Part J—[Measurement of Vessels]

* * * * *

CHAPTER 145—REGULATORY MEASUREMENT

SUBCHAPTER I—GENERAL

- Sec.
- 14501. Application.
- 14502. Measurement.
- 14503. Certificate of measurement.
- 14504. Remeasurement.

SUBCHAPTER II—FORMAL SYSTEMS

- 14511. [Application.]
- 14511. *Appalachian regional energy hub initiative.*
- 14512. *Appalachian Regional Commission nuclear energy development.*

SUBCHAPTER I—PROGRAMS

14501. Appalachian development highway system

(a) PURPOSE.—* * *

* * * * *

14511. Appalachian regional energy hub initiative

(a) IN GENERAL.—The Appalachian Regional Commission may provide technical assistance to, make grants to, enter into contracts with, or otherwise provide amounts to individuals or entities in the Appalachian region for projects and activities—

* * * * *

§ 14512. *Appalachian Regional Commission nuclear energy development*

(a) *Definitions.—In this section:*

(1) *Brownfield site.—The term ‘brownfield site’ has the meaning given the term in section 101 of the Comprehensive Environ-*

mental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601).

(2) Production facility.—The term ‘production facility’ has the meaning given the term in section 11 of the Atomic Energy Act of 1954 (42 U.S.C. 2014).

(3) Retired fossil fuel site.—The term ‘retired fossil fuel site’ means the site of 1 or more fossil fuel electric generation facilities that are retired or scheduled to retire, including multi-unit facilities that are partially shut down.

(4) Utilization facility.—The term ‘utilization facility’ has the meaning given the term in section 11 of the Atomic Energy Act of 1954 (42 U.S.C. 2014).

(b) Authority.—The Appalachian Regional Commission may provide technical assistance to, make grants to, enter into contracts with, or otherwise provide amounts to individuals or entities in the Appalachian region for projects and activities—

(1) to conduct research and analysis regarding the economic impact of siting, constructing, and operating a production facility or a utilization facility at a brownfield site, including a retired fossil fuel site;

(2) to assist with workforce training or retraining to perform activities relating to the siting and operation of a production facility or a utilization facility at a brownfield site, including a retired fossil fuel site; and

(3) to engage with the Nuclear Regulatory Commission, the Department of Energy, and other Federal agencies with expertise in civil nuclear energy.

(c) Limitation on Available Amounts.—Of the cost of any project or activity eligible for a grant under this section—

(1) except as provided in paragraphs (2) and (3), not more than 50 percent may be provided from amounts made available to carry out this section;

(2) in the case of a project or activity to be carried out in a county for which a distressed county designation is in effect under section 14526, not more than 80 percent may be provided from amounts made available to carry out this section; and

(3) in the case of a project or activity to be carried out in a county for which an at-risk county designation is in effect under section 14526, not more than 70 percent may be provided from amounts made available to carry out this section.

“(d) SOURCES OF ASSISTANCE.—Subject to subsection (c), a grant provided under this section may be provided from amounts made available to carry out this section, in combination with amounts made available—

(1) under any other Federal program; or

(2) from any other source.

(e) FEDERAL SHARE.—Notwithstanding any provision of law limiting the Federal share under any other Federal program, amounts made available to carry out this section may be used to increase that Federal share, as the Appalachian Regional Commission determines to be appropriate.

* * * * *

**TITLE 40—PUBLIC BUILDINGS,
PROPERTY, AND WORKS**

SUBTITLE IV—APPALACHIAN REGIONAL DEVELOPMENT

CHAPTER 147—MISCELLANEOUS

14703. AUTHORIZATION OF APPROPRIATIONS

(a) IN GENERAL.—In addition to amounts made available under section 14501, there is authorized to be appropriated to the Appalachian Regional Commission to carry out this subtitle—

(1) * * *

* * * * *

(d) APPALACHIAN REGIONAL ENERGY HUB INITIATIVE.—Of the amounts made available under subsection (a), \$5,000,000 shall be used to carry out section 14511 for each of fiscal years 2022 through 2026.

(e) *Appalachian Regional Commission Nuclear Energy Development.*—Of the amounts made available under subsection (a), \$5,000,000 may be used to carry out section 14512 for each of fiscal years 2023 through 2026.

[(e)] (f) AVAILABILITY.—Amounts made available under subsection (a) remain available until expended.

[(f)] (g) ALLOCATION OF FUNDS.—Funds approved by the Appalachian Regional Commission for a project in a State in the Appalachian region pursuant to a congressional directive shall be derived from the total amount allocated to the State by the Appalachian Regional Commission from amounts appropriated to carry out this subtitle.

* * * * *

ATOMIC ENERGY ACT OF 1954

[As Amended Through P.L. 108–458, December 17, 2004]

* * * * *

CHAPTER 1. DECLARATION, FINDINGS, AND PURPOSE

SECTION 1. DECLARATION.—Atomic energy is capable of application for peaceful as well as military purposes. It is therefore declared to be the policy of the United States that—

* * * * *

SEC. 103. COMMERCIAL LICENSES.—

(a) * * *

* * * * *

(d) No license under this section may be given to any person or activities which are not under or within the jurisdiction of the United States, except for the export of production or utilization facilities under terms of an agreement for cooperation arranged pursuant to section 123, or except under the provisions of section 109. No license may be issued to an alien or [any any] any rporation or other entity if the Commission knows or has reason to believe it is owned, controlled, or dominated by an alien, a foreign corpora-

tion, or a foreign government. In any event, no license may be issued to any person within the United States if, in the opinion of the Commission, the issuance of a license to such person would be inimical to the common defense and security or to the health and safety of the public.

* * * * *

SEC. 104. MEDICAL THERAPY AND RESEARCH AND DEVELOPMENT.—

(a) * * *

* * * * *

[(c) The Commission]

c. Research and Development Activities.—

(1) In general.—Subject to paragraphs (2) and (3), the Commission is authorized to issue licenses to persons applying therefor for utilization and production facilities useful in the conduct of research and development activities of the types specified in section 2051 of this title. [The Commission]

(2) Regulation.—The Commission is directed to impose only such minimum amount of regulation of the licensee as the Commission finds will permit the Commission to fulfill its obligations under this chapter to promote the common defense and security and to protect the health and safety of the public and will permit the conduct of widespread and diverse research and development.

(3) Limitation on utilization facilities.—The Commission may issue a license under this section for a utilization facility useful in the conduct of research and development activities of the types specified in section 31 if—

(A) not more than 75 percent of the annual costs to the licensee of owning and operating the facility are devoted to the sale, other than for research and development or education and training, of—

- (i) nonenergy services;*
- (ii) energy; or*
- (iii) a combination of nonenergy services and energy; and*

(B) not more than 50 percent of the annual costs to the licensee of owning and operating the facility are devoted to the sale of energy. [The Commission is authorized to issue licenses under this section for utilization facilities useful in the conduct of research and development activities of the types specified in section 2051 of this title in which the licensee sells research and testing services and energy to others, subject to the condition that the licensee shall recover not more than 75 percent of the annual costs to the licensee of owning and operating the facility through sales of nonenergy services, energy, or both, other than research and development or education and training, of which not more than 50 percent may be through sales of energy.]

* * * * *

SEC. 169. NO SUBSIDY.—No funds of the Commission shall be employed in the construction or operation of facilities licensed under section 103 or 104 except under contract or other arrangement entered into pursuant to section 31.

ATOMIC ENERGY ACT OF 1954 (This section is commonly referred to as the Price-Anderson Act).

* * * * *

SEC. 170. INDEMNIFICATION AND LIMITATION OF LIABILITY.—

(a) **REQUIREMENT OF FINANCIAL PROTECTION FOR LICENSEES.—**

* * * * *

(c) **INDEMNIFICATION OF LICENSEES BY NUCLEAR REGULATORY COMMISSION.**—The Commission shall, with respect to licenses issued between August 30, 1954, and **[December 31, 2025]** *December 31, 2045*, for which it requires financial protection of less than \$560,000,000, agree to indemnify and hold harmless the licensee and other persons indemnified, as their interest may appear, from public liability arising from nuclear incidents which is in excess of the level of financial protection required of the licensee. The aggregate indemnity for all persons indemnified in connection with each nuclear incident shall not exceed \$500,000,000, excluding costs of investigating and settling claims and defending suits for damage: *Provided, however,* That this amount of indemnity shall be reduced by the amount that the financial protection required shall exceed \$60,000,000. Such a contract of indemnification shall cover public liability arising out of or in connection with the licensed activity. With respect to any production or utilization facility for which a construction permit is issued between August 30, 1954, and **[December 31, 2025]** *December 31, 2045*, the requirements of this subsection shall apply to any license issued for such facility subsequent to **[December 31, 2025]** *December 31, 2045*.

d. **INDEMNIFICATION OF CONTRACTORS BY DEPARTMENT OF ENERGY.**—(1)(A) In addition to any other authority the Secretary of Energy (in this section referred to as the “Secretary”) may have, the Secretary shall, until **[December 31, 2025]** *December 31, 2045*, enter into agreements of indemnification under this subsection with any person who may conduct activities under a contract with the Department of Energy that involve the risk of public liability and that are not subject to financial protection requirements under subsection b. or agreements of indemnification under subsection c. or k.

* * * * *

(j) **CONTRACTS IN ADVANCE OF APPROPRIATIONS.**—In administering the provisions of this section, the Commission or the Secretary, as appropriate, may make contracts in advance of appropriations and incur obligations without regard to sections 1341, 1342, 1349, 1350, and 1351, and subchapter II of chapter 15, of title 31, United States Code.

(k) **EXEMPTION FROM FINANCIAL PROTECTION REQUIREMENT FOR NONPROFIT EDUCATIONAL INSTITUTIONS.**—With respect to any license issued pursuant to section 53, 63, 81, 104 a., or 104 c. for the conduct of educational activities to a person found by the Commission to be a nonprofit educational institution, the Commission shall exempt such licensee from the financial protection requirement of subsection a. With respect to licenses issued between August 30, 1954, and **[December 31, 2025]** *December 31, 2045*, for which the Commission grants such exemption:

(1) the Commission shall agree to indemnify and hold harmless the licensee and other persons indemnified, as their interests may appear, from public liability in excess of \$250,000 arising from nuclear incidents. The aggregate indemnity for all persons indemnified in connection with each nuclear incident shall not exceed \$500,000,000, including such legal costs of the licensee as are approved by the Commission;

(2) such contracts of indemnification shall cover public liability arising out of or in connection with the licensed activity; and shall include damage to property of persons indemnified, except property which is located at the site of and used in connection with the activity where the nuclear incident occurs; and

(3) such contracts of indemnification, when entered into with a licensee having immunity from public liability because it is a State agency, shall provide also that the Commission shall make payments under the contract on account of activities of the licensee in the same manner and to the same extent as the Commission would be required to do if the licensee were not such a State agency.

Any licensee may waive an exemption to which it is entitled under this subsection. With respect to any production or utilization facility for which a construction permit is issued between August 30, 1954, and **[December 31, 2025]** *December 31, 2045*, the requirements of this subsection shall apply to any license issued for such facility subsequent to **[December 31, 2025]** *December 31, 2045*.

* * * * *

(p) **REPORTS TO CONGRESS.**—The Commission and the Secretary shall submit to the Congress by **[December 31, 2021]** *December 31, 2041*, detailed reports concerning the need for continuation or modification of the provisions of this section, taking into account the condition of the nuclear industry, availability of private insurance, and the state of knowledge concerning nuclear safety at that time, among other relevant factors, and shall include recommendations as to the repeal or modification of any of the provisions of this section.

* * * * *

OMNIBUS APPROPRIATIONS ACT, 2009

* * * * *

DIVISION C—ENERGY AND WATER DEVELOPMENT AND RELATED AGENCIES APPROPRIATIONS ACT, 2009

* * * * *

Title III—Department of Energy

* * * * *

SEC. 313. [42 U.S.C. 16274a] UNIVERSITY NUCLEAR LEADERSHIP PROGRAM.

(a) **IN GENERAL.**—The Secretary of Energy, the Administrator of the National Nuclear Security Administration, and the Chairman of the **[Nuclear Regulatory]** Commission shall jointly establish a

program, to be known as the “University Nuclear Leadership Program”.

(b) USE OF FUNDS.—

(1) IN GENERAL.—Except as provided in paragraph (2), *and subsection (c)* amounts made available to carry out the Program shall be used to provide financial assistance for scholarships, fellowships, and research and development projects at institutions of higher education in areas relevant to the programmatic mission of the applicable Federal agency, with an emphasis on providing the financial assistance with respect to research, development, demonstration, and commercial application activities relevant to civilian advanced nuclear reactors including, but not limited to—

* * * * *

(c) *Nuclear Energy Traineeship Subprogram.*—

(1) *In general.*—*The Commission shall establish, as a subprogram of the Program, a nuclear energy traineeship subprogram under which the Commission, in coordination with institutions of higher education and trade schools, shall competitively award traineeships that provide focused training to meet critical mission needs of the Commission and nuclear workforce needs, including needs relating to the nuclear tradecraft workforce.*

(2) *Requirements.*—*In carrying out the nuclear energy traineeship subprogram described in paragraph (1), the Commission shall—*

(A) *coordinate with the Secretary of Energy to prioritize the funding of traineeships that focus on—*

- (i) *nuclear workforce needs; and*
- (ii) *critical mission needs of the Commission;*

(B) *encourage appropriate partnerships among—*

- (i) *National Laboratories;*
- (ii) *institutions of higher education;*
- (iii) *trade schools;*
- (iv) *the nuclear energy industry; and*
- (v) *other entities, as the Commission determines to be appropriate; and*

(C) *on an annual basis, evaluate nuclear workforce needs for the purpose of implementing traineeships in focused topical areas that—*

- (i) *address the workforce needs of the nuclear energy community; and*
- (ii) *support critical mission needs of the Commission.*

[(c)] (d) DEFINITIONS.—In this section:

[(1) ADVANCED NUCLEAR REACTOR; INSTITUTION OF HIGHER EDUCATION.—The terms “advanced nuclear reactor” and “institution of higher education” have the meanings given those terms in section 951 of the Energy Policy Act of 2005 (42 U.S.C. 16271).]

(1) *Advanced nuclear reactor.*—*The term ‘advanced nuclear reactor’ has the meaning given the term in section 951(b) of the Energy Policy Act of 2005 (42 U.S.C. 16271(b)).*

(2) *Commission.*—*The term ‘Commission’ means the Nuclear Regulatory Commission.*

(3) *Institution of higher education.*—The term ‘institution of higher education’ has the meaning given the term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

(4) *National laboratory.*—The term ‘National Laboratory’ has the meaning given the term in section 951(b) of the Energy Policy Act of 2005 (42 U.S.C. 16271(b)).

【(2)】 (5) PROGRAM.—The term “Program” means the University Nuclear Leadership Program established under this section.

【(d)】 (e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out the Program for each of fiscal years 2021 through 2025—

(1) \$45,000,000 to the Secretary of Energy, of which \$15,000,000 shall be for use by the Administrator of the National Nuclear Security Administration; and

(2) \$15,000,000 to the 【Nuclear Regulatory】 Commission.

