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Energy and Water Development Appropriations for Nuclear Weapons Activities: In Brief

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Introduction

Responsibility for U.S. nuclear weapons resides with both the U.S. Department of Defense (DOD) and the U.S. Department of Energy (DOE). DOD develops, deploys, and operates the missiles and aircraft that can deliver nuclear warheads. Based on presidential guidance, DOD also generates military requirements for the warheads carried on those platforms. The National Nuclear Security Administration (NNSA), a semiautonomous agency within the DOE, oversees the research, development, test, and acquisition programs that produce, maintain, and sustain the warheads.[1]

NNSA is also responsible for storing and securing undeployed warheads that are not deployed and for dismantling warheads that have been retired and removed from the stockpile. NNSA manages and sets policy for the U.S. nuclear weapons complex, consisting of eight sites in seven states. These sites include three laboratories (Los Alamos National Laboratory, NM; Lawrence Livermore National Laboratory, CA; and Sandia National Laboratories, NM and CA); four production sites (Kansas City Plant, MO; Pantex Plant, TX; Savannah River Site, SC; and Y-12 National Security Complex, TN); and the Nevada National Security Site (formerly Nevada Test Site).[2] (For additional information on NNSA and its sites, see CRS Report R48194, *The U.S. Nuclear Security Enterprise: Background and Possible Issues for Congress*.)

NNSA partners with DOD through the congressionally established Nuclear Weapons Council (NWC) to coordinate the nuclear weapons work between the two departments. The NWC is also responsible for the annual certification of NNSA's budget request.[3]

Congress authorizes funding for DOD and NNSA nuclear weapons activities in the annual National Defense Authorization Act (NDAA) and provides funding for the NNSA through the Energy and Water Development Appropriations Act. (For an overview of the Energy and Water Development Appropriations Act, see CRS Report R48097, *Energy and Water Development: FY2025 Appropriations*.)

NNSA operates three programs, each of which receives funding in a dedicated appropriation account: Defense Nuclear Nonproliferation, Naval Reactors, and Weapons Activities. The Weapons Activities program is the subject of this report. The Weapons Activities appropriation account supports U.S. nuclear warheads and associated components, provides the materials and components for those weapons, and sustains and modernizes the infrastructure that supports these missions. According to NNSA, the Weapons Activities account provides for "the maintenance and refurbishment of nuclear weapons to continue sustained confidence in their safety, reliability, and performance; continued investment in scientific, engineering, and manufacturing capabilities to enable production and certification of the enduring nuclear weapons stockpile; and manufacture of nuclear weapon components."

NNSA's budget request for FY2025 seeks $19.8 billion for Weapons Activities, $740.6 million (3.9%) more than the enacted funding of $19.11 billion in FY2024, within a total budget of $25

[1] For a history of the nuclear weapons program and related topics, see U.S. Department of Energy, National Nuclear Security Administration, "NNSA Timeline," at https://www.energy.gov/articles/history-energy-departments-role-nuclear-security.

[2] For details on the sites in the Nuclear Weapons Complex, see CRS Report R45306, *The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites*.

[3] For more on the NWC, see U.S. Department of Defense, "Nuclear Weapons Council," in *Nuclear Matters Handbook*, 2020, https://www.acq.osd.mil/ncbdp/nm/NMHB2020rev/docs/NMHB2020rev_Ch6.pdf.

billion for NNSA.[4] In its budget request, NNSA notes that the "overarching mission" for Weapons Activities is to "deliver warheads that meet military requirements." According to NNSA Administrator Jill Hruby, "NNSA is being asked to do more than at any time since the Manhattan Project."[5] As required by Congress, the FY2025 budget request lists the following NNSA integrated priorities for weapons activities:[6]

- Support the active stockpile.
- Execute warhead modernization programs.
- Reestablish and modernize production infrastructure and capabilities.
- Plutonium pit production.
- Modernization and production programs for other materials and components.
- Develop and sustain strong science, technology, and engineering efforts to support the stockpile and the design, assessment, and certification infrastructure which underpin the deterrent.
- Continue assessing concepts to meet future threats.
- Address gaps in experimental and computational capabilities.
- Hire and retain the workforce necessary to achieve deliverables and address retirements.
- Secure transport of nuclear materials and warheads.
- Uphold strong proactive maintenance and recapitalization programs.
- Implement physical security systems and measures across the complex.
- Sustain and improve information technology systems and cybersecurity to meet. directives and other requirements.

Selected Major Activities

NNSA's budget request for FY2025 seeks $19.8 billion for Weapons Activities, $740.6 million (3.9%) more than the enacted funding of $19.11 billion in FY2024.[7] The FY2025 request contains funding to continue NNSA's nuclear warhead modernization programs and to modernize NNSA production and research facilities, as well as funding to support future plutonium pit production at the Savannah River Site and Los Alamos National Laboratory. The Weapons Activities appropriation is organized into four main mission areas, after being reorganized and renamed in FY2021. These programs, each with a request of over $3 billion for FY2025, include the following:

[4] U.S. Department of Energy, *Department of Energy FY 2025 Budget in Brief, FY 2025 Congressional Justification, March 2024*, p. 139, at https://www.energy.gov/sites/default/files/2024-03/doe-fy-2025-budget-in-brief-v2.pdf, as well as p. 6-8 in U.S. Department of Energy, *Comparative Appropriation by Congressional Control FY2025 v2*, April 2024, https://www.energy.gov/sites/default/files/2024-03/doe-fy-2025-budget-approps-congressional-control-v2.pdf.

[5] Department of Energy, "NNSA Administrator Jill Hruby Remarks at the 2024 Nuclear Deterrence Summit," February 1, 2024, https://www.energy.gov/nnsa/articles/nnsa-administrator-jill-hruby-remarks-2024-nuclear-deterrence-summit.

[6] U.S. Department of Energy, *Department of Energy FY 2025 Congressional Justification, National Nuclear Security Administration, Federal Salaries and Expenses, Weapons Activities, Defense Nuclear Nonproliferation, Naval Reactors, March 2024, Office of the Chief Financial Officer, Volume I*, p. 140-143, https://www.energy.gov/sites/default/files/2024-03/doe-fy-2025-budget-vol-1-v3.pdf.

[7] U.S. Department of Energy, *Comparative Appropriation by Congressional Control FY2025 v2*, April 2024, p. 7, https://www.energy.gov/sites/default/files/2024-03/doe-fy-2025-budget-approps-congressional-control-v2.pdf.

- **Stockpile Management.** The budget requested $188 million (-3.5%) less funding for FY2025 than was enacted in FY2024 to support work on nuclear warhead life extension programs, warhead surveillance and quality assurance, maintenance, and related activities.
- **Production Modernization.** The budget requested $11 million (0.2%) more funding for FY2025 than was enacted in FY2024 for programs that focus on maintaining and expanding the production capabilities for nuclear weapons components critical to weapons performance.[8]
- **Stockpile Research, Technology, and Engineering.** The budget requested $106 million (-3.2%) less funding for FY2025 than was enacted in FY2024 for programs that provide the scientific foundation for the current and future stockpile. This category replaces the Research, Development, Test and Evaluation program area.
- **Infrastructure and Operations (I&O).** The budget requested $715 million (27.7%) more funding for FY2025 than was enacted in FY2024 for programs to maintain, operate, and modernize NNSA's infrastructure. This category is intended to support construction of new facilities and also fund deferred maintenance in older facilities.

In addition to these activities, the NNSA also requested in the budget a total of $195 million (9%) more funding for FY2025 than was enacted in FY2024 for several other programs, such as the Secure Transportation Asset, Defense Nuclear Security, Information Technology and Cybersecurity, and Legacy Contractor Pensions (see **Table 1**).

Table 1. Funding for Weapons Activities by Major Category, FY2022-FY2025

(millions of current dollars)

Program	FY2022 Enacted	FY2023 Enacted	FY2024 Enacted	FY2025 Request	$ Change (FY2025 Request-FY2024 Enacted)	% Change (FY2025 Request-FY2024 Enacted)
Stockpile Management	4,637.7	4,954.1	5,329.2	5,140.7	-188.5	-3.5%
Production Modernization	2,911.0	5,116.7	5,865.9	5,877.7	11.8	0.2%
Stockpile RT&E[a]	2,843.0	2,950.0	3,280.4	3,174.2	-106.3	-3.2%
I&O	3,868.3	2,602.6	2,584.8	3,299.9	715.1	27.7%
Other[b]	1,660.0	1,889.0	2,161.2	2,356,25	195.0	9%
Prior year balances	0	-396.0	-113.6	0	113.6	-100%
Total	**15,920.0**	**17,116.1**	**19,108.0**	**19,849.0**	**740.6**	**3.9%**

Sources: NNSA FY2025 budget request and Department of Energy, *Comparative Appropriation by Congressional Control FY2025 v2*; Committee on Appropriations Energy and Water Subcommittee explanatory statement to Division D-Energy and Water Appropriations Act, 2023, p. 175-182 of PDF; Committee on Appropriations Energy and Water Subcommittee explanatory statement to Division D-Energy and Water Appropriations Act, 2024, p. 116-122 of PDF.

Notes: Totals may not sum due to rounding. RDT&E: Research, Development, Test and Evaluation; I&O: Infrastructure and Operations.

[8] According to NNSA, these include primaries, canned subassemblies, radiation cases, and non-nuclear components.

a. Stockpile RT&E: Beginning in FY2024, Academic Programs, which had previously been within the Stockpile RT&E Program, will be its own separate program.

b. Other: Secure Transportation Asset, Defense Nuclear Security, Information Technology and Cybersecurity, and Legacy Contractor Pensions and Settlement Payments, and Academic Programs beginning in FY2024.

Stockpile Management

According to NNSA's FY2025 budget materials, the Stockpile Management requirements "maintain a safe, secure, reliable and effective nuclear weapons stockpile."[9] The activities in this program area include warhead life extension, modification, and design efforts; the annual assessment process for the current active stockpile; stockpile sustainment activities; warhead dismantlement activities; and sustainment of manufacturing capabilities and capacities. The Stockpile Management program includes five subprograms:

- Stockpile Major Modernization: includes continuing activities for the B61-12 Life Extension Program (LEP), W88 Alteration (ALT) 370, W80-4 LEP, W87-1 Modification program, and a feasibility study for the W93 program. The FY2025 budget request also includes development and production engineering activities for the B61-13 program. The budget request further notes that, "while a dedicated line item for the Sea Launched Cruise Missile (SLCM) is not currently included in the FY 2025 request, NNSA is proposing $1,165 [million] for the W80-4 warhead which the NDAA associates with SLCM-N."[10]
- Stockpile Sustainment: includes activities to maintain and develop each Stockpile System and Multi-Weapons System. According to NNSA, Stockpile Sustainment executes "maintenance, surveillance, assessment, surety, management activities, and support of weapons until they are dismantled for all enduring weapons systems in the stockpile."[11] The program includes the B61, W76, W78, W80, B83, W87, and W88 Stockpile Systems, and Multi-Weapon Systems.[12]
- Weapons Dismantlement and Disposition (WDD): includes funding for the interim storage of warheads awaiting dismantlement, funding for actual dismantlement, and funding for the disposition of warhead components and materials.
- Production Operations (PO): sustains manufacturing capabilities and capacities, including weapons assembly and disassembly, component production, surveillance, and weapon safety and reliability testing.
- Nuclear Enterprise Assurance (NEA): a program introduced in FY2023, NEA "actively manages subversion risks to the nuclear weapons stockpile and associated design, production, and testing capabilities."[13]

[9] U.S. Department of Energy, *Department of Energy FY 2025 Congressional Justification, National Nuclear Security Administration, Federal Salaries and Expenses, Weapons Activities, Defense Nuclear Nonproliferation, Naval Reactors, March 2024, Office of the Chief Financial Officer, Volume I*, p. 104.

[10] Ibid., p. 14. For more information about the SLCM-N program, see CRS In Focus IF12084, *Nuclear-Armed Sea-Launched Cruise Missile (SLCM-N)*, by Paul K. Kerr and Mary Beth D. Nikitin.

[11] Ibid., p. 104.

[12] Ibid., p. 158.

[13] Ibid., p. 105.

Table 2 provides data on weapons activities by warhead program.[14]

Table 2. Weapons Activities Funding by Warhead Program, FY2022-FY2025 Request

(dollars in millions)

Program	Associated DOD System	FY2022 Enacted	FY2023 Enacted	FY2024 Enacted	FY2025 Request	$ Change (FY2025 Request-FY2024 Enacted)	% Change (FY2025 Request-FY2024 Enacted)
B61-12 LEP	Nuclear-Capable Aircraft/ Bomber	771.66	672.02	449.85	27.50	-422.35	-93.9%
B61-13 LEP		0	0	52.00	16.00	-36.00	-69.2%
W88 Alt 370	Submarine-Launched Ballistic Missile	207.16	162.06	178.82	78.70	-100.12	-56.0%
W80-4 LEP	Air-Launched Cruise Missile	1,080.40	1,122.45	1,009.93	1,164.80	154.82	15.3%
W80-4 ALT-SLCM			20.00	70.00	0*[a]	-70.00	-100%
W87-1 Modification	Inter-continental Ballistic Missile	691.03	680.13	1,068.91	1,096.03	27.12	2.5%
W93	Submarine-Launched Ballistic Missile	72.00	240.51	389.66	455.78	66.12	17.0%

Sources: NNSA FY2025 Budget Request and Comparative Appropriation by Congressional Control FY2025 v2; Committee on Appropriations Energy and Water Subcommittee explanatory statement to Division D-Energy and Water Appropriations Act, 2023, p. 175 of pdf; Committee on Appropriations Energy and Water Subcommittee explanatory statement to Division D-Energy and Water Appropriations Act, 2024, p. 116 of pdf.

a. The FY2025 budget request states that "while a dedicated line item for the Sea Launched Cruise Missile (SLCM) is not currently included in the FY 2025 request, NNSA is proposing $1,165M for the W80-4 warhead which the NDAA associates with SLCM-N." (U.S. Department of Energy, *Department of Energy FY 2025 Congressional Justification, National Nuclear Security Administration, Federal Salaries and Expenses, Weapons Activities, Defense Nuclear Nonproliferation, Naval Reactors, March 2024, Office of the Chief Financial Officer, Volume I*, p. 140).

Production Modernization

According to NNSA's FY2025 budget materials, the Production Modernization program is tasked with "modernizing the facilities, infrastructure, and equipment that produce materials and components to meet stockpile requirements and maintain the Nation's nuclear deterrent."[15] The highest spending category in NNSA's FY2025 budget request, the Production Modernization program includes six subprograms:

[14] Ibid., p. 157 is the source for the program and associated DOD system. It should be noted that the B61-13 and W80-4 SLCM are not listed in the in the FY2025 budget request table on current U.S. nuclear weapons and associated delivery systems. Sources for funding are listed below the table.

[15] Ibid., p. 105.

- Primary Capability Modernization: includes plutonium pit modernization and high explosives and energetics modernization. In its FY2025 budget request, NNSA notes that the increase supports plutonium pit production at Los Alamos National Laboratory. NNSA states that the agency "remains committed to achieving the pit production capability goals on the path to 80 [pits per year]" and will provide congressional with quarterly briefings on pit production.[16]
- Secondary Capability Modernization: includes uranium modernization, depleted uranium modernization, and lithium modernization. This category's budget primarily request reflects increased investment in a variety of operations at the Y-12 facility.[17]
- Tritium Modernization and Domestic Uranium Enrichment: the Tritium Modernization portion of this program funds activities needed to produce, recover, and recycle the tritium gas used in U.S. nuclear weapons, while the Domestic Uranium Enrichment Program is designed to ensure a reliable supply of enriched uranium to support U.S. national security and nonproliferation needs. The budget increase is due to "needs for labor and material purchases" as well as the initiation of design activities for the Domestic Uranium Enrichment program.[18]
- Non-Nuclear Capability Modernization: according to NNSA, this program area funds capabilities necessary for the "design, qualification, production, and surveillance" of non-nuclear components for multiple weapon systems.[19] The budget increase is for the expansion of efforts at the Kansas City plant and the modernization of capabilities at Sandia National Labs.[20]
- Capability Based Investments: according to NNSA, this program "modernizes scientific and manufacturing capabilities that have degraded due to aging, broken, or outdated equipment and supporting systems."[21]
- Warhead Assembly Modernization: this program, new in FY2025, is for modernizing capabilities associated with the assembly and disassembly of warheads at the Pantex plant.[22]

Stockpile Research, Technology, and Engineering

According to NNSA's FY2025 budget materials, the Stockpile Research, Technology, and Engineering program "provides the knowledge and expertise needed to maintain confidence in the nuclear stockpile without additional nuclear explosive testing."[23] The program funds not only science and engineering programs, but also large experimental facilities, such as the Enhanced Capabilities for Subcritical Experiments (ECSE) program at the Nevada National Security Site (NNSS), and NNSA's first Exascale high performance computing system at Livermore

[16] Ibid., pp. 105-106.

[17] Ibid.

[18] Ibid.

[19] Ibid., p. 112.

[20] Ibid., p. 105.

[21] Ibid.

[22] Ibid., p. 112.

[23] Ibid., p. 367.

Laboratory.[24] The Stockpile Research, Technology, and Engineering program includes five subprograms:

- Assessment Science: this program area performs experiments to obtain the materials and nuclear data required to validate and understand the physics of nuclear weapons performance, and conducts activities that develop, exercise, and maintain the expertise of NNSA's nuclear weapon design, engineering, and assessment community.[25]
- Engineering and Integrated Assessments: this program area aims to ensure that current and future nuclear weapons systems are survivable and adaptable. It includes developing advanced weapons capabilities as well as certification and qualification capabilities.[26]
- Inertial Confinement Fusion: this program area focuses on High Energy Density (HED) science capability development for nuclear weapons applications. It includes funding for the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory.[27]
- Advanced Simulation and Computing: this program area supports stockpile stewardship with advanced modeling and computing capabilities to help maintain confidence in the nuclear stockpile without underground explosive testing.[28]
- Weapon Technology and Manufacturing Maturation: according to NNSA budget documents, this program area provides "agile, affordable, assured, and responsive technologies and capabilities for nuclear stockpile sustainment and modernization."[29]

Infrastructure and Operations

According to NNSA budget materials, the Infrastructure and Operations Program "maintains, operates, and modernizes NNSA's infrastructure," which includes planning and constructing all NNSA support facilities except for complex-construction projects (which are funded by that specific capability sponsor).[30] Major changes in the FY2025 budget request include increased funding for the production of plutonium pits and for the expansion of capacity at the Kansas City facility, as well as for projects at the Savannah River Site.[31]

[24] For additional information on Exascale, see Exascale Computing Project at https://www.exascaleproject.org/research-group/national-security/.

[25] U.S. Department of Energy, Department of Energy, FY 2025 Congressional Justification, National Nuclear Security Administration, Federal Salaries and Expenses, Weapons Activities, Defense Nuclear Nonproliferation, Naval Reactors, March 2024, Office of the Chief Financial Officer, Volume I, p. 371-372, https://www.energy.gov/sites/default/files/2024-03/doe-fy-2025-budget-vol-1-v3.pdf.

[26] Ibid., p. 391.

[27] Ibid., p. 417.

[28] Ibid., p. 428-429.

[29] Ibid., p. 447.

[30] Ibid., p. 115.

[31] Ibid.

Selected Legislative Activity

FY2025 Appropriations and Authorizations

NNSA's budget request for FY2025 seeks $19.8 billion for Weapons Activities, $740.6 million (3.9%) more than the enacted funding of $19.11 billion in FY2024. The House of Representatives Committee on Appropriations-reported FY2025 Energy and Water Development and Related Agencies Appropriations Act (H.R. 8997) provides $20.34 billion for Weapons Activities, which is $490.11 million over the NNSA request. The Senate Committee on Appropriations-reported FY2025 Energy and Water Development and Related Agencies Appropriations Act (S. 4927) provides $19.93 billion for Weapons Activities, which is $81.36 million over the NNSA request.

The House of Representatives-passed FY2025 National Defense Authorization Act (NDAA) (H.R. 8070) authorizes $19.98 billion for Weapons Activities, which is $127.00 million over the NNSA request. The Senate Armed Services Committee-reported FY2025 NDAA (S. 4638) authorizes $19.90 billion for Weapons Activities, which is $51.20 million over the NNSA request.

FY2024 Appropriations

NNSA's budget request for FY2024 sought $18.83 billion for Weapons Activities, $1.72 billion (10.0%) more than the enacted funding of $17.12 billion in FY2023. The Energy and Water Development and Related Agencies Appropriations Act, 2024 (P.L. 118-42), provided $19.108 billion for NNSA Weapons Activities—$275 million (1.4%) more than the requested amount (see **Table 3**).[32]

Table 3. Funding Appropriated for NNSA Weapons Activities in FY2024 Energy and Water Appropriations Act

(in billions of dollars of budget authority)

Requested	HAC-Reported Act (H.R. 4394)	SAC-Released Act (S. 2443)	Enacted Act (Division D of P.L. 118-42)
$18.833	$19.114	$18.833	$19.108

Sources: H.Rept. 118-126 accompanying H.R. 4394, p. 166; S.Rept. 118-72 accompanying S. 2443, p. 155; and P.L. 118-42.

Notes: HAC is House Appropriations Committee; SAC is Senate Appropriations Committee.

FY2024 Authorizations

The National Defense Authorization Act for Fiscal Year 2024 (NDAA; P.L. 118-31) authorized $19.123 billion for NNSA Weapons Activities (see **Table 4**).

[32] For more background and analysis on this legislation, see CRS Report R47293, *Energy and Water Development: FY2023 Appropriations*, by Mark Holt and Anna E. Normand.

Table 4. Funding Authorized for NNSA Weapons Activities in FY2024 NDAA

(in billions of dollars of budget authority)

Requested	House-Passed NDAA (H.R. 2670)	SASC-Reported NDAA (S. 2226)	Enacted NDAA (P.L. 118-31)
$18.833	$18.953	$19.109	$19.122

Sources: H.Rept. 118-125 accompanying H.R. 2670, p. 559; S.Rept. 118-58 accompanying S. 2226, p. 402; H.Rept. 118-301, p. 804.

Note: SASC is Senate Armed Services Committee.

Potential Issues for Congress

Congressional oversight activities for the programs described above could include hearings, annual appropriations and authorizations, reporting requirements, or site visits. Congress may continue to track progress on NNSA's ability to meet its program goals, particularly as part of the annual budget cycle hearings. (For additional information and additional issues for Congress, see CRS Report R48194, *The U.S. Nuclear Security Enterprise: Background and Possible Issues for Congress*.)

Program Schedule and Costs

During the 2010s, NNSA prioritized life extension programs, as well as research and development, over conducting maintenance of production facilities. NNSA is currently modernizing many of its nuclear-weapons capabilities and the associated production infrastructure, which Administrator Hruby said was its "biggest challenge" in her 2022 testimony to Congress.[33] Some analysts have questioned NNSA's ability to complete these projects on time. A 2022 RAND study found that the nuclear enterprise workforce may be inadequate to "handle the sheer number and scope of activities associated with nuclear modernization programs."[34]

Congress has expressed concerns about the costs and schedules of NNSA's capital projects. Both House and Senate Appropriations Committee reports on the FY2024 Energy and Water Development and Related Agencies Appropriations Act noted concern with the NNSA's ability to "properly estimate costs" and schedules "for large projects."[35] The FY2024 NDAA established reporting requirements focused on the costs and schedule of numerous NNSA capital projects, and mandated that NNSA "develop and maintain a high-level milestone schedule document for all covered construction projects that includes production infrastructure modernization schedules with weapons modernization programs."[36] In January 2024 remarks, NNSA Administrator Hruby stated that the agency's "objective in infrastructure modernization" is to "substantively increase

[33] Hearing to Receive Testimony on the Nuclear Weapons Council, U.S. Senate Subcommittee on Strategic Forces, Committee on Armed Services, May 4, 2022, https://www.armed-services.senate.gov/imo/media/doc/22-37_05-04-2022.pdf.

[34] Laura Werber et al., *Is the National Nuclear Enterprise Workforce Postured to Modernize the Triad?*, RAND Corporation, 2022, at https://www.rand.org/content/dam/rand/pubs/research_reports/RRA1200/RRA1227-1/RAND_RRA1227-1.pdf.

[35] H.Rept. 118-126 accompanying H.R. 4394, https://www.congress.gov/congressional-report/118th-congress/house-report/126/1; S.Rept. 118-72 accompanying S. 2443, https://www.congress.gov/congressional-report/118th-congress/senate-report/72/1.

[36] H.Rept. 118-301 accompanying H.R. 2670, https://www.congress.gov/congressional-report/118th-congress/house-report/301.

our flexibility and resilience, meet production schedules safely, introduce modern and efficient technologies, and be realistic about costs while exercising fiscal responsibility."[37]

NNSA's Weapons Activities funding category has steadily increased in recent years, and the FY2025 request continued this trend. Congress has expressed concerns about cost growth and transparency in NNSA's programs during budget hearings. Congress has also directed the Government Accountability Office (GAO) to give testimony, publish reports documenting delays, and offer its recommendations. GAO's assessments of NNSA's program of record[38] have also expressed concern with the potential for cost overruns. In a 2019 report, GAO noted that "missed milestones have the potential to increase costs and further delay schedules," and that NNSA has a "history of program management challenges that have resulted in significant cost overruns."[39]

Plutonium Pit Production and Aging

Congress has expressed concerns about NNSA's ability to meet the congressional requirement to be able to produce 80 plutonium pits per year by 2030. Since 2018, NNSA has pursued a "two-site strategy" that involves the annual production of 30 pits at LANL and 50 pits at SRS. As discussed in this report, the relevant facilities at LANL are undergoing modernization while the SRS site is being repurposed from its former mixed-oxide (MOX) fuel development mission to the pit production mission.[40] NNSA has stated that LANL has "transitioned to 24/7 facility availability" but still needs additional personnel to "meet rate production goals."[41] NNSA also acknowledged that achieving the production of 50 pits at SRS by 2030 was "not feasible," but "as close as possible to 2030" remained "a high priority."[42]

Congress and GAO have both expressed concerns about the costs and schedule of these efforts.[43] In FY2021, Congress mandated that NNSA provide a plan outlining an integrated master schedule (IMS) for "all pit production-related project and program activities" going forward. Both the House and the Senate Energy and Water Development Appropriations Subcommittees again stressed their concerns about these programs in their FY2024 appropriations reports.[44] Both noted that NNSA had not yet submitted the required IMS. A January 2023 GAO report on plutonium pit production stated that NNSA still lacks a "comprehensive schedule or cost estimate

[37] Department of Energy, "NNSA Administrator Jill Hruby Remarks at the 2024 Nuclear Deterrence Summit," February 1, 2024, https://www.energy.gov/nnsa/articles/nnsa-administrator-jill-hruby-remarks-2024-nuclear-deterrence-summit.

[38] A program of record is an approved government procurement program specified in budget documentation.

[39] U.S. Government Accountability Office, Nuclear Security Enterprise: NNSA Should Use Portfolio Management Leading Practices to Support Modernization Efforts, GAO-21-398, June 9, 2021, at https://www.gao.gov/products/gao-21-398.

[40] For more information on the MOX program, see CRS Report R43125, *Mixed-Oxide Fuel Fabrication Plant and Plutonium Disposition: Management and Policy Issues*, by Mark Holt and Mary Beth D. Nikitin, updated December 14, 2017.

[41] FY24 SSMP, p. 3-3.

[42] FY24 SSMP, p. 3-3.

[43] GAO, *NNSA Does Not Have a Comprehensive Schedule or Cost Estimate for Pit Production Capability*, January 2023, https://www.gao.gov/products/gao-23-104661. In the FY2024 NDAA, Congress directed NNSA to "to develop and manage the plutonium modernization program, or any subsequently developed program, using an integrated master schedule and a life cycle cost estimate that fully meets GAO best practices for both schedule development and cost estimating." H.Rept. 118-301 accompanying H.R. 2670, https://www.congress.gov/congressional-report/118th-congress/house-report/301.

[44] H.Rept. 118-126 and S.Rept. 118-72.

that meets GAO best practices."[45] When questioned about the availability of a life cycle cost estimate for the program in 2023 Congressional hearings, NNSA Administrator Hruby stated that NNSA will release an initial cost estimate in April 2024 and an improved estimate will follow in 2025.[46]

Some analysts have also questioned the necessity to produce 80 plutonium pits by the year 2030, arguing that the functioning of existing pits will not be detrimentally affected.[47] NNSA is studying plutonium pit aging to be able to "more confidently predict pit lifetimes for each weapon system in the stockpile," according to a February 2024 GAO report.[48] The explanatory statement for the FY2024 Energy and Water Development and Related Agencies Appropriations Act directs NNSA to enter into an agreement with the JASON scientific advisory group for assessing NNSA's work on plutonium pit aging.[49]

NNSA-DOD Coordination

DOD and NNSA seek to align their program schedules through the NWC. However, many of DOD's nuclear modernization programs depend on NNSA delivery of associated components in a timely manner. The 2022 Nuclear Posture Review (NPR), an executive branch document on U.S. "nuclear strategy, policy, posture, and forces," argued for a "resilient and adaptive nuclear security enterprise" based on three pillars, the first of which was improved DOD-NNSA coordination. The NPR noted that "there is little or no margin between the end of life of existing systems and their replacements."[50] Congressional committees have questioned executive branch officials about the potential impact of NNSA delays on DOD. Should NNSA face unexpected delays, this may affect DOD programmatic and operational requirements. In January 2024 remarks, NNSA Administrator Hruby stated, "This past year alone, NNSA has delivered more than 200 modernized weapons" to the DOD, also stating that "there should be no doubt in anyone's minds—NNSA is modernizing our stockpile both on-schedule and at pace."[51] Congress may continue to track NNSA progress on meeting program goals and its relationship with the DOD, particularly as part of the annual budget cycle hearings.

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[45] U.S. Government Accountability Office, *Nuclear Weapons: NNSA Does Not Have a Comprehensive Schedule or Cost Estimate for Pit Production Capability*, GAO-23-104661, January 12, 2023, at https://www.gao.gov/products/gao-23-10466

[46] Senate Committee on Armed Services, Hearing to Receive Testimony on the Department of Energy's Atomic Energy Defense Activities and Department of Defense Nuclear Weapons Programs in Review of the Defense Authorization Request for Fiscal Year 2024 and the Future Years Defense Program, April 18, 2023, https://www.armed-services.senate.gov/imo/media/doc/23-28_04-18-2023.pdf.

[47] David Kramer, "Concerns about aging plutonium drive need for new weapon cores," Physics Today, July 2018, https://pubs.aip.org/physicstoday/article/71/7/22/922429/Concerns-about-aging-plutonium-drive-need-for-new.

[48] GAO, *Nuclear Weapons: Information on the National Nuclear Security Administration's Research Plan for Plutonium and Pit Aging*, February 2024, https://www.gao.gov/assets/d24106740.pdf.

[49] P.L. 118-42. U.S. House Committee on Appropriations, Division D-Energy and Water Development and Related Agencies Appropriations Act, 2024, March 3, 2024, https://docs.house.gov/billsthisweek/20240304/FY24%20EW%20Conference%20JES%20scan.pdf.

[50] U.S. Department of Defense, *2022 Nuclear Posture Review*, pp. 23-24, https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF.

[51] Department of Energy, "NNSA Administrator Jill Hruby Remarks at the 2024 Nuclear Deterrence Summit," February 1, 2024, https://www.energy.gov/nnsa/articles/nnsa-administrator-jill-hruby-remarks-2024-nuclear-deterrence-summit.

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