SIERRA CLUB

DRAFT

Ms. Jennifer Nelson, NEPA Document Manager
National Nuclear Security Administration, Savannah River Field Office
P.O. Box A
Aiken, SC 29802
Email: NEPA-SRS@srs.gov

Sierra Club Nuclear Free Core Team
2101 Webster St. Suite 1300
Oakland CA 94612

May 29, 2020

Re: "Draft EIS for Plutonium Pit Production at the SRS in South Carolina" Comments on National Nuclear Security Administration's Draft Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina, DOE/EIS-0541.

*"Our world faces a crisis as yet unperceived by those possessing the power to make great decisions for good or evil. **The unleashed power of the atom has changed everything save our modes of thinking and we thus drift toward unparalleled catastrophe. We scientists who unleashed this immense power have an overwhelming responsibility in this world life and death struggle to harness the atom for the benefit of mankind and not for humanity's destruction."***
Albert Einstein, *1946*

Dear Ms. Nelson,

Sierra Club supports the "No Action" alternative EIS for Plutonium Pit Production, Savannah River Site 1/5-a

There is no rationale for building a Plutonium Bomb Plant at Savannah River Site, South Carolina.

1. Savannah River Site has no experience or expertise in the manufacture of plutonium pits. By authorizing SRS to produce plutonium pits NNSA would repeat the mistakes made in building the MOX, mixed oxides plant at SRS, squandering at least $10 Billion. https://www.reuters.com/article/us-usa-nukes-plutonium-specialreport/americas-nuclear-headache-old-plutonium-with-nowhere-to-go-idUSKBN1HR1KC — 2/1-h
2. NNSA's assertion that the current U.S. stockpile of plutonium pits is degraded and degrading is not corroborated by independent studies, including the JASON 2019 review. Currently there are over 20,000 plutonium pits stored at the Pantex facility near Amarillo TX. The sheer volume of these plutonium pits, which could be re-used, poses an enormous environmental and fiscal burden. — 3/1-c
3. Pit production would produce a host of chemical and nuclear waste streams and it is unacceptable that dumping of low-level nuclear waste in unlined trenches at SRS is being considered. — 4/6-j.6
4. Pit production could distract from the main mission of the site and the largest amount of funding - cleaning up tens of millions of gallons left over from production of plutonium and nuclear weapons materials. — 5/6-j.8
5. Producing new-design nuclear weapons, the justification of which is doubtful, and replacing pits in the entire stockpile, which appears to be the unstated goal, could stimulate a costly new nuclear arms race. — 6/2-g
6. Please discuss how producing pits for 80 or more nuclear weapons per year until all pits are replaced in all nuclear weapons complies with the legal requirements in the Nuclear Non-Proliferation Treaty "to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control." — 7/2-c
7. Discuss exactly what new-design weapons pits would be for must be discussed, including the W87-1-like and W93 warheads. Under what circumstances would new-design weapons and new pits be subjected to underground nuclear testing? — 8/1-g, 9/2-d
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10. As plutonium was stranded at SRS when the MOX project collapsed, what would prevent more plutonium ending up at SRS if the pit project was terminated mid-stream or halted due to an accident? — 12/6-j.2
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13. Details of the role of the Y1-2 National Security Complex in providing HEU or other support for pit production must be fully discussed. 16/6-p.2

14. I support preparation of an over-arching, legally mandated Programmatic Environmental Impact Statement (PEIS) which would examine the need for expanded pit production and the role in pit design, pit production and waste handling at DOE sites across the country, including SRS, Los Alamos, Pantex, Y-12, the Waste isolation Pilot Plant, Sandia, the Nevada Nuclear Security Site, and the Kansas City National Security Campus (where non-nuclear components are managed). The PEIS must be completed before the final EIS on SRS pit production is finalized. 17/4-f

United States remains in violation of the Nuclear Non-Proliferation Treaty

By "modernizing" the U.S. nuclear arsenal, including the manufacture of Plutonium Bomb Pits at Savannah River Site and Los Alamos NM, the United States is violating the spirit and letter of the legally binding Treaty on Non-Proliferation of Nuclear Weapons NPT Article VI, ratified in 1970 and extended indefinitely in 1995. NSSA must take into consideration the legally ratified and binding NPT and how production of new plutonium pits for newly designed nuclear weapons will violate the NPT. 18/2-a

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19/2-d
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Sierra Club supports the U.N. Treaty on the Prohibition of Nuclear Weapons.

https://www.un.org/disarmament/wmd/nuclear/tpnw/

Sincerely,

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For Sierra Club Nuclear Free Core Team

Lori Dunn, Director
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Included please find official Sierra Club polices regarding nuclear weapons dating to 1961, and "Nuclear Budgets by Country" compiled by the International Committee for the Abolition of Nuclear Weapons, ICAN.

SIERRA CLUB

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Sierra Club endorsement of Back from the Brink call to Prevent Nuclear War:

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* renouncing the option of using nuclear weapons first;
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Position endorsed Aug. 13, 2019 by National Program co-leads Ramon Cruz and Debbie Sease

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History proves that the production and testing of nuclear weapons poses grave environmental risks. The cost to human life and health and the environmental devastation caused by the use of nuclear weapons is unthinkable. Sierra Club applauds the efforts of the International Campaign to Abolish Nuclear Weapons, recipient of the 2017 Nobel Peace Prize, and supports global ratification and implementation of a verifiable, binding UN treaty with the goal of reducing and eliminating nuclear weapons.

Treaty text: http://undocs.org/A/CONF.229/2017/8

UN website with background information: https://www.un.org/disarmament/ptnw/index.html

Adopted by the Board of Directors, November 8, 2017

Minimum Deterrence Policy

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Adopted by the Board of Directors, March 16-17, 1991

Moratorium on Production of Weapons-Grade Fissile Materials

Recognizing the dangers of nuclear proliferation and the immediate threats to public health and environmental safety from the continuous production of fissile materials, the Sierra Club urges the United States government to negotiate a global, verifiable moratorium on the production of plutonium and highly enriched uranium.

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Because of the grave threat to Earth's environment from space-based weapons and because the Sierra Club believes that outer space should be preserved for peaceful cooperation, exploration, and scientific discovery, the Sierra Club opposes any development, testing, or deployment of space- based weaponry. Consequently, the Sierra Club:

1. Opposes the unilateral pursuit of space-based weapons systems beyond basic research to keep current on what is and what is not feasible;
2. Calls upon Congress to limit appropriations for the Strategic Defense Initiative accordingly;
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The Sierra Club's position is based on the following considerations:

1. The risk of nuclear war and nuclear winter with their potential for initiating mass extinction of life on Earth would be increased by the possible pre-emptive (first-strike) use of space-based weapons and by the likelihood that pursuing them would remove all current restraints to the arms race, such as the ABM Treaty of 1972, the SALT II limits, the Partial Test Ban Treaty of 1963, the Outer Space Treaty of 1967, and the Non-Proliferation Treaty of 1968.
2. Radioactive and/or other debris from space based weapons testing and orbiting nuclear reactors used for weapons application may contaminate the extra-atmospheric space environment and damage life on Earth.
3. Pursuing the Strategic Defense Initiative would drain financial resources and scientific talent badly needed for the solution of pressing environmental problems and other socially beneficial programs.

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The Sierra Club reaffirms its support for the nuclear non-proliferation treaty and urges all nations to sign and adhere to it. Stricter enforcement of it and attendant international inspection is needed to prevent diversion of nuclear materials for weapons purposes. Realization of its aim will be enhanced by the negotiation of a verifiable, comprehensive test ban treaty that would impede the development of nuclear weapons by more countries.

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Moreover, the U.S. and the Soviet Union should apply pressure on other nations, which may be supplying such materials, to stop exports to countries which they cannot influence directly, and to impose much stricter controls on the export and use of technology that could be used for nuclear weapons. The Sierra Club encourages its environmentally minded colleagues in other nations to press for these reforms in their countries.

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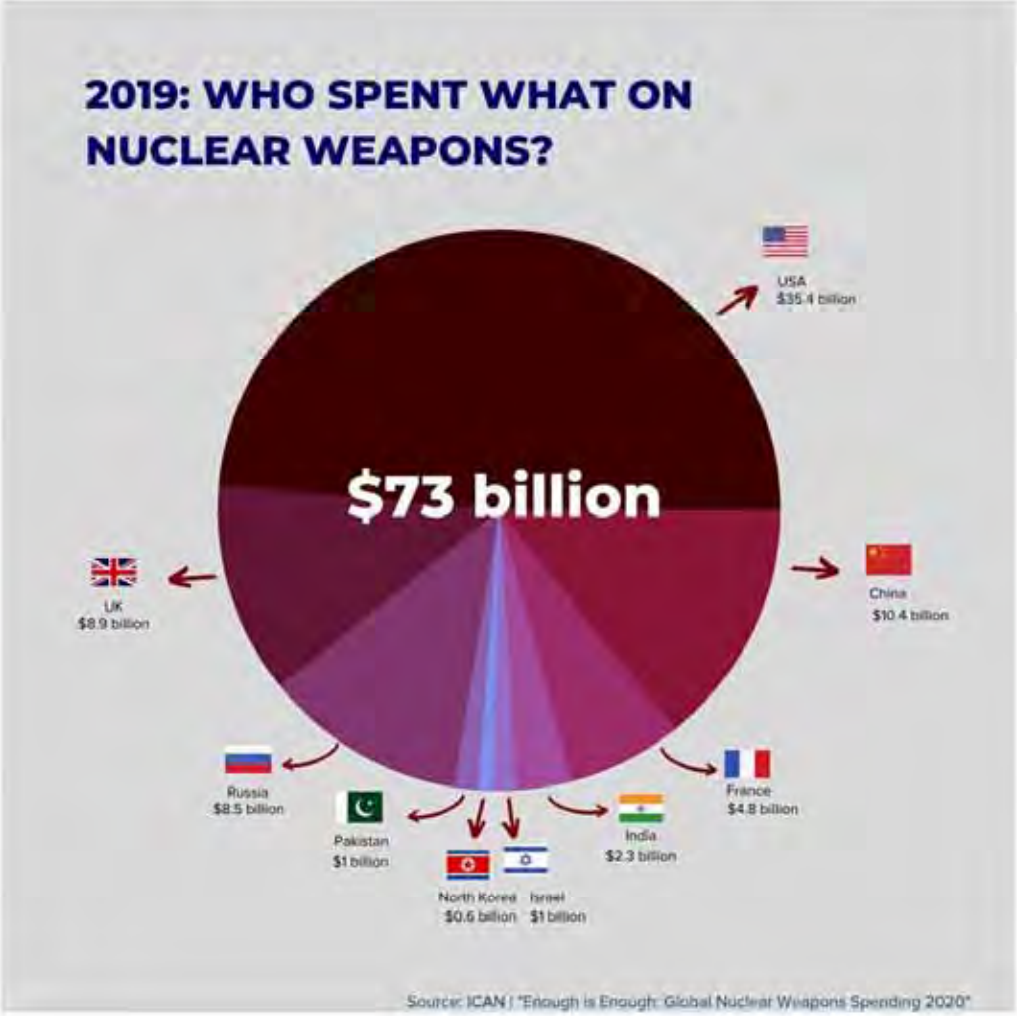

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FOUNDED 1892

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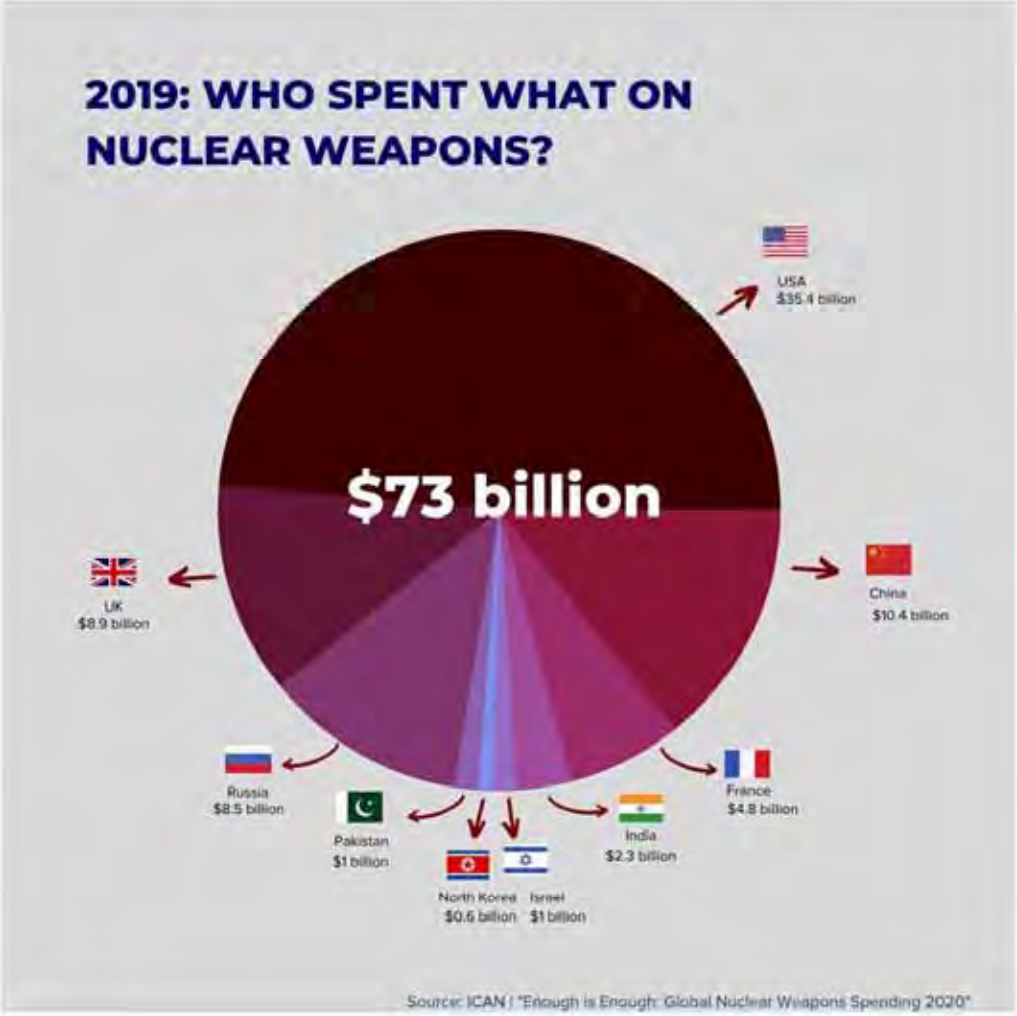

From: Raine Nimmer <raine.nimmer@gmail.com>
Sent: Friday, May 29, 2020 5:34 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL]

Dear Ms. Nelson:

I am writing to oppose plutonium pit production at the Savannah River Site in South Carolina—the No Action Alternative in the Draft EIS. In addition, I believe the NNSA must complete a new Programmatic EIS before it can prepare a site-specific Environmental Impact Statement. The PEIS must fully analyze the reuse of the 15,000+ plutonium pits in storage at Pantex before it embarks on a dangerous, multi-billion dollar plan to build an unnecessary new bomb plant.

1/5-a
2/4-f
3/1-b

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-----Original Message-----
From: Lewis Patrie <patrie.wncpsr@main.nc.us>
Sent: Monday, June 1, 2020 7:28 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Cc: L & J Patrie <patrie.wncpsr@main.nc.us>
Subject: [EXTERNAL] Proposed Pu Pits at SRS

TO:
Ms. Jennifer Nelson
NEPA Document Manager
National Nuclear Security Administation
Savannah River Field Office
P.O. Box A
Aiken, SC 29802

Dear Ms. Nelson,

I write you in opposition to the proposed Plutonium Pit Production Factory at the Savannah River Site (SRS, as the U. S. is awash in is existing nuclear weapons. Should a small fraction of them detonate it would likely end human life due to a nuclear winter. Creating more nuclear weapons adds to the danger. The Cold War ended long ago. Both then and now, plutonium is a dangerous substance that wreaks havoc in its production, storage, disposal and ownership. The U.S. has ample history of horrors from radioactive waste problems. We don't need more! Considering the effects of current coronavirus pandemic, we must work globally to control the dangers of which we are aware, we must not add to our existing woes. not add to ones already existent. May we join together for a positive future together with no nuclear weapons, and not add to radioactive pollution and waste, and reduce threat of war. 1/5-a

The National Environmental Policy Act (NEPA) requires analysis of ALL IMPACTS of a proposed action in an Environmental Impact Statement (EIS) but the EIS for Plutonium Pit Production at Savannah River Site (SRS) fails to analyze the impact of its end product, a nuclear weapon, the impact of which is wholesale environmental destruction. The EIS is also deficient in its failure to analyze the impacts on national security from starting a new nuclear arms race or from insider sabotage and malevolent acts which a volatile plutonium facility would attract. 1/4-g 2/2-g 3/6-l.1

It has been almost 30 years since the Cold War's nuclear arms race ended, with the U.S. the most heavily armed of all nations. The International C ourt of Justice has outlawed nuclear weapons, and a U.N. Treaty to Abo! lish Nuclear Weapons is in the process of being ratified having already garnered 37 of 50 signatures required. The U.S. is out of step with world trends and should be showing leadership in nuclear dismantlement and disarmament, instead of starting a new nuclear arms race. 4/2-g

On the heels of failure to complete a MOX plutonium fuel factory at SRS, a Department of Energy (DOE) project which wasted 17 years and billions of taxpayer dollars, DOE is illegally pursuing its intent to convert the unfinished MOX factory to make plutonium pits for nuclear weapons with publication of this EIS. It amounts to a theft of public trust and 5/2-h

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funding to switch tracks from a nuclear security and environmental management progra! m to a nuclear weapons manufacturing program.

The idea of converting SRS from a plutonium clean-up site into manufacturing nuclear warhead triggers has been proposed, studied, and rejected three times. Plutonium pit production at SRS was proposed in 1989 in the "Complex 21" proposal, in 2003 as the "Modern Pit Facility" and again in 2007 as "Complex 2030." In each instance, the pit production facility failed to garner public acceptance and was abandoned. Los Alamos has been unable to produce pits, and for the 4th time in 30 years, plutonium pit production at SRS is proposed, this time to convert the failed MOX plutonium fuel factory at SRS to plutonium pit production. The time is ripe for a new strategy - - Plutonium immobilization utilizing 35,000,000 gallons of highly radi! oactive liquid waste stored at SRS, a concept which was considered in the Programmatic Plutonium EIS which accompanied the MOX program and which should be considered as the Preferred Alternative in the current EIS.

Up to 13 tons of plutonium are stored at SRS, the leftovers from operations at Rocky Flats, Los Alamos, Hanford, and Lawrence Livermore. The plutonium at SRS, called "junk plutonium" by critics, is in the form of plutonium oxide "dust," metal scraps, and contaminated objects, and is stored in thousands of small canisters at SRS. The junk plutonium at SRS was not suitable for M! OX fuel and is not suitable for pits. To convert the abandoned MOX factory to pit production would require importing more plutonium to SRS and would block the option to repurpose the MOX factory to responsible management of the plutonium already stranded in South Carolina by converting it to plutonium immobilization. This is a problem which is not contemplated in the EIS. 6/4-e

National security will be best served with a plutonium immobilization program to place the plutonium already at SRS into the glassification process at SRS's Defense Waste Processing Facility (DWPF). This immobilization process utilizes the intense, long-lived radioactivity of the tank waste as a security barr ier for the junk weapons-grade plutonium, thus satisfying both waste r! emediation and non-proliferation goals.

Plutonium immobilization is the best option for national security and for SRS. Plutonium immobilization is the most efficient and cost-conscious way to solve both the radioactive waste problem and the plutonium security problem. Plutonium immobilization is the preferred use for the partially complete MOX plutonium fuel factory. A plutonium immobilization program will be a long-term federally funded program, bringing millions of dollars into the economy, employing South Carolinians and Georgians, and ultimately protecting the low country environment while aiding global security. We urge NNSA/DOE to provide the necessary leadership to get the p! lutonium immobilization option restored and funded by including it in the EIS.

Please send me a copy of the final EIS and include me in future public hearings about plutonium disposition at SRS.

Sincerely

Lewis E. Patrie, M. D.
26 Wesley Drive, Apt H
Asheville, N. C. 28803
828 285-2599
patrie.wncpsr@main.nc.us

From: John Pope <john@rethinkmedia.org>
Sent: Tuesday, June 2, 2020 4:53 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] SRS Pit Production EIS Comment

Dear Ms. Nelson:

I'm joining in what is already no doubt a chorus of voices calling for an environmental impact statement for the proposed pit production at the Savannah River Site in South Carolina

I, like many others, am concerned about using SRS in this way. The facility has never held this role before and failure of both the MOX project at SRS and past pit production at Rock Flats makes it seem far too dangerous and costly for the potential benefit. But I know that the Department of Energy disagrees so if pit production must go forward I believe further study and preparation is needed. 1/1-h

We must be assured that:

- no chemical or nuclear waste would flow into the surrounding watershed.

- that workers and the surrounding community will be protected and compensated in case of contamination or accident. This is particularly important because of the historically bad track record in acknowledging damage to and subsequently compensating nuclear frontline communities. 2/6-c-2 3/8-f 4/1-b

- this pits are necessary to begin with, considering 15,000 pits are already held in Pantex.

A broad Programmatic Environmental Impact Statement (PEIS) examining the need for expanded pit production and the role in program support, pit design, pit production and waste handling at DOE sites across the country, including SRS, Los Alamos, Pantex, Y-12, the Waste Isolation Pilot Plant, Sandia, the Nevada Nuclear Security Site, and the Kansas City National Security Campus (which supplies non-nuclear components for all nuclear warheads) would answer many of these questions. The PEIS must be completed before the final EIS on SRS pit production or the Supplement Analysis on 5/4-f

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pit production at Los Alamos are finalized. NNSA's plans for SRS and Los Alamos are inextricably linked and those plans should be reviewed in a single document, a PEIS.

John Pope

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John Pope (he/him/his)
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Ms. Jennifer Nelson, NEPA Document Manager
National Nuclear Security Administration, Savannah River Field Office
P.O. Box A
Aiken, SC 29802

Email: NEPA-SRS@srs.gov

The South Carolina Department of Health and Environmental Control, Office of Environmental Affairs submits the following comments for the DOE/EIS-0541: Plutonium Pit Production at Savannah River Site; Aiken, South Carolina. Any comments or questions should be sent to Henry Porter at porterhj@dhec.sc.gov.

Section 2.1.4 – This section identifies commercial disposal facilities that could be used for disposal of LLW. These do not include the Energy Solutions commercial LLW facility located in Barnwell, South Carolina. Please confirm that DOE will not use the Barnwell, South Carolina Energy Solutions facility for disposal of any waste from the SRPPF. Space at this facility is limited and is reserved for waste generated by the Atlantic Compact States. 1/6-j.15

Section 2.1.6 – This section discusses the Wrought Production Process as an alternative manufacturing process. Is this the process that was used at the Rocky Flats Plant? 2/3-g

Section 2.5 - PLANNING ASSUMPTIONS AND BASIS FOR ANALYSIS, 5. This section identifies that most waste operations would occur on the night shift and weekends. Does this include the activities associated with the management of waste in the waste storage areas and the preparation of waste shipments, or only the waste activities within the 226 F building? 3/6-p.11

Section 2.5 - PLANNING ASSUMPTIONS AND BASIS FOR ANALYSIS, 9. This section identifies that liquid TRU waste will be solidified as part of the SRPPF operations. Will any of the liquid TRU waste streams be mixed TRU waste?

Section 3.9.2 - Transuranic Waste – This section identifies that the "production of TRU waste at SRS is now estimated at approximately 460 cubic yards (350 cubic meters) per year (SRNS 2020). These projections include TRU wastes from surplus plutonium disposition from SRS and reflect a time frame when the proposed SRPPF would become operational (e.g., estimated 2026)." With the addition of the TRU waste from the Pit Production at 820 cubic yards (626 cubic meters) annually this would be over 1,000 cubic meters of TRU waste generation annually at SRS. Will WIPP be able to receive this volume of waste annually? This should not result in long-term storage of TRU waste at SRS. 4/6-j.16

Section 3.9.2 - Transuranic Waste This section identifies that "WIPP was originally planned for an operational life of 25 years, followed by closure and post closure phases. In August 2019, DOE released, for stakeholder review and comment, a draft Carlsbad Field Office Strategic Plan based on maintaining WIPP TRU waste disposal operations active through 2050 as needed to support identified TRU waste inventory (CBFO 2019b, p. 5)." The planned 50 year life of SRPPF would be 30 years past this date or 2080. DOE should identify plans to manage the TRU waste generated by SRPPF after 2050. 5/6-j.5

Section 3.9.3 - Low-Level Radioactive Waste - The management of the additional LLW generated by SRPPF must not jeopardize the onsite disposal capacity for waste generated by the closure activities or impact closure schedules in the SRS FFA. 6/6-j.6

Section 4.9.2 - Sensitivity Analyses discusses the Wrought Process – Would the waste produced from the wrought process be different from that produced by the casting process? Specifically would more lubricants and solvents be used for this process which would increase the volume of mixed TRU and mixed LLRW waste? 7/6-j.10

Section 4.9.1.2 - Operations Low-Level Radioactive Waste—Liquid - This section identifies that the aqueous recovery process will result in a liquid waste stream that will be sent to the SRS Effluent Treatment Facility (ETF). The ETF is used to treat low-level radioactive waste from a variety of sources at SRS and includes a waste stream from the high-level waste (HLW) tanks at SRS. Completion of processing the HLW will occur prior to the 50 year operating life of the SRPPF. Will ETF continue to operate to manage the SRPPF aqueous liquid waste stream, or will there be another treatment system used for this waste stream? 8/6-j.17

Several sections of Volume I of the EIS, including Table 2-4 on page 57, contain the statement "minimal "high and adverse" impacts from construction and operations are expected; to the extent that any impacts may be high and adverse, NNSA expects the impacts to affect all populations in the area equally." These statements, particularly the portion that says impacts will affect all populations equally, assume that all populations enjoy the same social and environmental benefits, endure the same social and environmental stressors, and therefore will have the same social and environmental outcomes. EJ populations typically are disproportionally impacted by environmental pollution, poor access to healthcare, chronic diseases, food insecurity, housing insecurity, and other problems. Therefore, this statement is technically true, but not practically true. Section 4.13.8 of the EIS appears to acknowledge the disproportionate impacts and offers to take "measures that would minimize impacts to human health, [including] emergency preparedness and response plans and public outreach and training..." The measures that will be taken to minimize impacts to human health especially those to EJ populations should be specifically outlined in the EIS. These should address impacts though air, water and land. 9/6-i.2

From: Priscilla Preston <priscilla.preston@alumni.unc.edu>
Sent: Friday, May 29, 2020 3:19 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] Draft SRS Pit Production EIS Comment

Ms. Jennifer Nelson, NEPA Compliance Officer
National Nuclear Security Administration
Savannah River Field Office
P.O. Box A
Aiken, SC 29802

Re: Draft SRS Pit Production EIS Comment

Emailed to *NEPA-SRS@srs.gov*

Dear Ms. Nelson:

Thank you for giving me the opportunity to comment on the draft Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina. The following comments have been expressed by many others so I will begin with the comments that I have not heard expressed previously.

First of all, there is no mention of the **impact of climate change on the construction and operation of the proposed facility**. Table S-6 mentions the cumulative impact analysis of global climate change but fails to mention the environmental impact of a series of severe weather events in the area. The words "tornado" and "hurricane" are not mentioned in the summary document. The collapse of the infrastructure in the area surrounding SRS due to the inability to maintain the electrical grid or clear roads after multiple storms such as tornados is the most serious environmental impact due to the amount of plutonium and other hazardous waste being proposed for the site. Please note the number of extreme tornados in the area in 2020 alone. SRS was also threatened by Hurricane Dorian in 2019. There is no discussion of the shut down procedures for on-going operations in severe weather. The process for switching to generators and how long the plant could run on generator power is not discussed. The question of the criticality risk of plutonium getting caught in a dangerous configuration or process line is not mentioned. Earthquakes are mentioned but only to say "Extremely Unlikely earthquake with subsequent fire." There is no mention of how long generator power would last in the case of a severe seismic event. Table S-1 mentions "Need to include a robust analysis about the effects of climate change on the Southeast" as one of the scoping comments. I concur with that comment.

1/6-d.1
2/6-1.4
3/6-l.5
4/6-l.6
1/6-d.1 (Cont'd)

Another understated aspect of the proposal is the detrimental Environmental Justice impact. The "Environmental Justice" discussion, section 3.8.2, does not take into account down-wind communities or communities that live at the fence line. The communities that come to mind are in Barnwell, South Carolina, downwind from prevailing winds, and the Shell Bluff community directly across the river in Georgia. The

5/6-i.2

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report does not mention any attempt to notify those residents of the plans to build nuclear weapons cores close to their neighborhoods. The discussion was generic in nature and did not review specific communities that could be impacted in case of a nuclear criticality, plutonium fire or other accident. The report simply states "To the extent that any impacts may be adverse, NNSA expects the impacts to affect all populations in the area equally and cumulative environmental justice impacts are not expected." The report fails to acknowledge that the site is surrounded by low-income populations with limited access to information. They are the ones that would be most affected by the "maximum cumulative offsite population dose" of radiation as mentioned in the report. Although the amount of radiation exposure may be comparatively low, the residents in the area are less likely to have the resources to protect themselves from the health effects of the exposure or any accidents. Also the summary does not mention the health consequences of accidents or seepage into the groundwater. This level of insensitivity to the effects on the fence line and downwind populations is one of the most egregious failings in the environmental impact statement. It is well known that polluting industries are sited in disadvantaged neighborhoods and SRS is no exception.

5/6-i.2
(Cont'd)

The plutonium pit stockpile is too large, additional pits are not justified and threaten our security : Multiple studies by government agencies have found that pits last for at least 100 years. The average pit age in the active stockpile is less than 40 years old. More than 15,000 existing pits are already stored at the Pantex Plant near Amarillo, TX. It appears that DOE intends to maintain 4000 nuclear weapons through this century even though studies have shown that firing more than 100 nuclear weapons would likely cause nuclear winter and thereby destroy all human food sources. Such a large stockpile undermines our security, violates the disarmament provisions of the Nuclear Non-Proliferation Treaty, risks a new nuclear arms race and would cost over $1 trillion over the next 30 years. Exact replicas of existing pits will NOT be built. Since pits cannot be full-scale tested under the current international testing moratorium, heavily modified pit designs could actually endanger national security by undermining confidence in nuclear weapons reliability. Or it could pressure the United States to resume nuclear weapons testing, which would have severe international proliferation consequences.

6/1-b
7/1-c
8/2-a
9/2-d

The effort to produce plutonium pits at SRS involves too much risk to South Carolina . Significant safety lapses in the plutonium-processing operations at the HB-Line at the Savannah River Site have been documented in recent reports over the last few years to the SRS Citizens Advisory Board. That process, producing plutonium oxide, has been terminated but admitted problems with it underscore the significant lack of experience and skill at SRS in plutonium handling. Production of plutonium and casting into buttons that were shipped to the contaminated Rocky Flats site last happened over 30 years ago and since then wide-scale plutonium experience by staff has atrophied. It will take a monumental effort to essentially start from point zero to educate staff about plutonium handling and processing necessary for pit production and fabrication

10/6-k.1
11/6-h.2

South Carolinians do not want more nuclear material stored or dumped in our state. Pit production would yield a large amount of low-level nuclear waste that would be dumped into unlined trenches at SRS. DOE's National Nuclear Security Administration estimates pit production would produce a minimum of 7,800 cubic yards per year of LLW. In 2007, SRS was designated as the site to store surplus non-pit plutonium and currently stores about 12 metric tons of plutonium in the old K-Reactor. We do not want more plutonium which has a half-life of 24,000 years. Moreover, the Department of Energy is legally required to remove plutonium from South Carolina, not add plutonium because of pit production.

12/6-j.6
13/6-j.2

The MOX building cannot be easily converted to pit production. No engineering basis has been presented to convert the MOX building safely to pit production. SRS would be on a steep learning curve, which could set up the pit project for failure, leaving plutonium stranded at SRS.

14/3-j

NNSA has so far refused to prepare the legally mandated Programmatic Environmental Impact Statement (PEIS) to address the need and impacts of expanded pit production DOE system-wide. NNSA has argued in both cases (SRS and Los Alamos) that it can rely on outdated 2008 versions. The

15/4-f

1997 Stockpile Stewardship and Management programmatic environmental impact statement only sanctioned 20 pits per year, while the current proposal calls for 80 or more pits per year. The current proposal calls for redundant plutonium pit production at the Savannah River Site inherently making it a nation-wide proposal and therefore requiring programmatic study. The legal standard under NEPA for requiring new environmental impact statements is substantial new information and changed circumstances, both of which clearly apply here. I am requesting that NNSA comply with the law and prepare a PEIS for plutonium pit production at SRS and Los Alamos. 15/4-f (Cont'd)

Clean-up of waste, which provides SRS about $1.4 billion per year, is the best way to provide jobs and funding at SRS. Clean up is a better use of the SRS site than generating more waste and threatening all humanity with a nuclear war. Spending $1 billion per year at SRS and Los Alamos on pit production - an amount likely to escalate based on past DOE performance - would place a severe strain on the DOE budget and damage funding for clean-up and better-justified projects. Currently we need funding to help our nation survive the COVID-19 crisis and other expected future disasters resulting from climate change. 16/6-j.8

The MOX project was mismanaged by NNSA and they should not be given another opportunity for mismanagement. The $5 billion wasted on MOX plant construction and the mismanagement of the MOX project by NNSA and contractors is an indicator of how another large, costly project at SRS will be managed. Successful or not, an attempt to produce plutonium pits could increase the risk of a nuclear arms race. 17/8-d 18/2-g

In 2020 in the middle of the COVID-19 crisis, we urge Congress, especially House Armed Services and House Appropriations Committees, to halt and defund unjustified plans for pit production. The request of $440 million for the SRS Plutonium Bomb Plant must be rejected by the Appropriations committees and the Armed Services committees must reject the current requirement that 80 pits per year be produced by 2030.

Further, with all the mounting federal debt, we need to rebuild our national economy in a just and equitable manner that devotes resources toward protecting our fragile planet and provides greater economic and health benefits for the people instead of military spending that benefits the already privileged few. In any event, relying on NNSA for community economic growth is a bad bet given its track record of project failures and lack of broadly spread benefits to diverse populations. 19/5-a

Nuclear weapons and climate change are the two existential threats to our country. America should demonstrate global leadership towards the ultimate abolition of nuclear weapons, as it pledged to do in the 1970 NonProliferation Treaty, instead of embarking upon a $1.7 trillion "modernization" program of nuclear weapons forever. 20/2-c

In conclusion, I support the "no action" alternative to maintain the security of all human life on earth. The EIS makes a unjustified claim that " Under the No-Action Alternative, NNSA would not proceed with the SRPPF, which might limit the ability to maintain, long-term, the nuclear deterrent that is a cornerstone of U.S. national security policy." If the planned plutonium pits were used as functionally intended, most of humanity in addition to many other life forms would be killed within a short period of time. To build such devices is irrational and contrary to all that is good. 19/5-a (Cont'd)

Sincerely,

Priscilla Preston
2803 Wheat Street

Columbia SC 29205

From: Beth Ann Rocheleau <bethann.rocheleau@gmail.com>
Sent: Friday, May 29, 2020 1:02 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] Draft SRS Pit Production EIS Comment

Ms. Jennifer Nelson

NEPA Compliance Officer

National Nuclear Security Administration

Savannah River Field Office, P.O. Box A

Aiken, South Carolina 29802

NEPA-SRS@srs.gov

Dear Ms. Nelson:

I hereby submit the following comments on the *Draft Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina*, and ask that they be made part of the official record.

I support the "no action alternative" whereby the poorly constructed Mixed Oxide Fuel Fabrication Facility (MOX) is not converted to plutonium pit production. 1/5-a

I am concerned about the proposal to expand the role of the Savannah River Site (SRS) into the production of plutonium pits. It is imperative that pit reuse and refurbishment be thoroughly analyzed (and results made public) before new pit production is considered. 2/3-a

Before considering "repurposing" the MOX plant, investigations into waste, fraud, abuse and mismanagement with the MOX debacle are necessary. Please provide evidence that such investigations are taking place. Please publically identify and specify the many MOX plant construction problems. 3/8-d

I support preparation of an over-arching Programmatic Environmental Impact Statement (PEIS) which will examine the need for expanded pit production at both SRS and Los Alamos as the two are inextricably linked. 4/4-f

Pit production will produce chemical and nuclear waste streams in unlined SRS trenches – affecting the environment and workers in an area largely comprised of minority populations. Pit production will be vulnerable to the effects of climate change – an increase in number and severity of weather events in the area. Please identify the technology to be used to purify plutonium at SRS, and address the environmental effect of the technology. 5/6-j.6 6/6-i.2 7/6-d.1 8/6-l.4 9/6-p.1

Pit production will distract from the main mission of the site -- cleaning up tens of millions of gallons of high-level nuclear waste left over from production of plutonium and nuclear weapons materials. Pit production is another step toward a costly 10/6-j.8

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new nuclear arms race. Pit production is at cross-purposes to the legal requirement specified in the Nuclear Non-Proliferation Treaty to pursue cessation of the nuclear arms race. 11/2-a 12/2-g

Thank you for considering my comments, and for responding to them. Please confirm receipt of these comments.

Beth Ann Rocheleau

350 River Club Road

Lexington SC 29072

From: gss or gfv <garyfromvermont@yahoo.com>
Sent: Saturday, May 30, 2020 6:04 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] no more pit production please

may 30,2020

The United States has no need to continue the dangerous production of plutonium pit triggers. The process produces multiple Cancerous by products and the US already has so many more weapons than any other country. 1/1-b

thank you for reading my concerns

Gary Sachs
Box 186four
Brattleboro Vt 05302

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From: Alice Slater <alicejslater@gmail.com>
Sent: Sunday, May 31, 2020 7:20 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] Oppose Plutonium Pit Production at Savannah River Site in South Carolina

Dear Ms. Nelson:

I am writing to oppose plutonium pit production at the Savannah River Site in South Carolina—the No Action Alternative in the Draft EIS. In addition, I believe the NNSA must complete a new Programmatic EIS before it can prepare a site-specific Environmental Impact Statement. The PEIS must fully analyze the reuse of the 15,000+ plutonium pits in storage at Pantex before it embarks on a dangerous, multi-billion dollar plan to build an unnecessary new bomb plant. 1/5-a 2/4-f 3/3-a

At a time when our nation is undergoing the most horrendous pandemic, we should be not improving or expanding the nuclear arsenal--we should be negotiating for nuclear abolition and huge cuts in military spending so we can take care of our real problems in this country and in the world. 4/5-a

Sincerely
Alice Slater

Alice Slater
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www.wagingpeace.org
www.worldbeyondwar.org

We may now care for each Earthian individual at a sustainable billionaire's level of affluence while living exclusively on less than 1 percent of our planet's daily energy income from our cosmically designed nuclear reactor, the Sun, optimally located 92 million safe miles away from us. Buckminster Fuller

From: Steven Sondheim <stevensondheim@yahoo.com>
Sent: Monday, June 1, 2020 11:28 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] No

No

1/5-a

StevenSondheim

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From: Brent Spence <brntspnc@gmail.com>
Sent: Tuesday, June 2, 2020 4:30 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] Fwd: Comment in Opposition to Plutonium Pit Production Proposed for SRS in the Draft EIS

June 2, 2020

TO:
Ms. Jennifer Nelson
NEPA Document Manager
National Nuclear Security Administation
Savannah River Field Office
P.O. Box A
Aiken, SC 29802

Dear Ms. Nelson,

As I'm sure you are aware, the proposed Plutonium Pit Production Factory planned for the Savannah River Site (SRS) is dangerous and unnecessary. Plutonium is dangerous. Its production, storage, disposal and ownership all wreak havoc. The Cold War ended long ago yet the horrors from radioactive waste continue to grow. 1/5-a

Let's work cooperatively as a global community for a positive future with NO nuclear weapons, NO more radioactive pollution and waste. We need to jdevelop viable mediation options to prevent escalation of disagreements into the threat of war.

Others have pointed out that the National Environmental Policy Act (NEPA) requires analysis of ALL IMPACTS of a proposed action in an Environmental Impact Statement (EIS). That includes:

- analyzing the impacts on the world of the end product, a nuclear weapon (which is wholesale environmental destruction); 2/4-g

- analyzing the impacts, including costs, on national security of a nuclear arms race; 3/2-g

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- analyzing the impacts of trying to prevent insider sabotage and malevolent acts. 4/6-l.1

The idea of converting SRS from a plutonium clean-up site into manufacturing nuclear warhead triggers has been rejected three times. It is long past time for a new strategy. I leave it to others to detail what that should be - it should employ local people and protect the low country environment while aiding global security. I urge NNSA/DOE to provide the necessary leadership to get this type of option funded by including it in the EIS. 5/4-e

Respectfully submitted,

Brent Spence
Arlington, Virginia

From: [redacted]
Sent: Tuesday, June 2, 2020 7:35 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] Abolish Nuclear Weapons Forever!

To whom this may concern:

I would like my comments to be published as anonymous!!!

[redacted]

There are far too many nuclear weapons already that nine countries possess. There have already been several near miss, nuclear wars already!!!! We are all living on borrowed time! The Doomsday Clock is now 100 seconds to midnight, the closest ever since it began by the Bulletin of the Atomic Scientists in 1947. Dr. Albert Einstein promoted peace and was an activist to rid the world of nuclear weapons. Why can't his scientific w

We are all facing a global pandemic, massive extinctions plus the proven threat of climate change. All government money needs to divested from the military industrial complex to humanitarian needs of the citizens of our planet. This money could be used for universal health care, hospital PPE needs, scientific advancements to mitigate climate change, pandemic mitigation, covid-19 testing for all and research for a viable cure or vaccine. 1/5-a

Our government needs to employ the unemployed due to the covid-19 with jobs to rebuild our roads, airports, PPE jobs, sustainable agriculture, education via laptops and internet access for all. There is so much that nuke bomb and military industrial complex money could be used for the loving care of our planet and all its inhabitants.

The USA and the other eight nuke bomb countries have enough nuke weapons to exterminate us all many times over. I pray for peace. Please listen to Pope Francis and all the other spiritual leaders which are calling for economies based on peace and goodwill to all.

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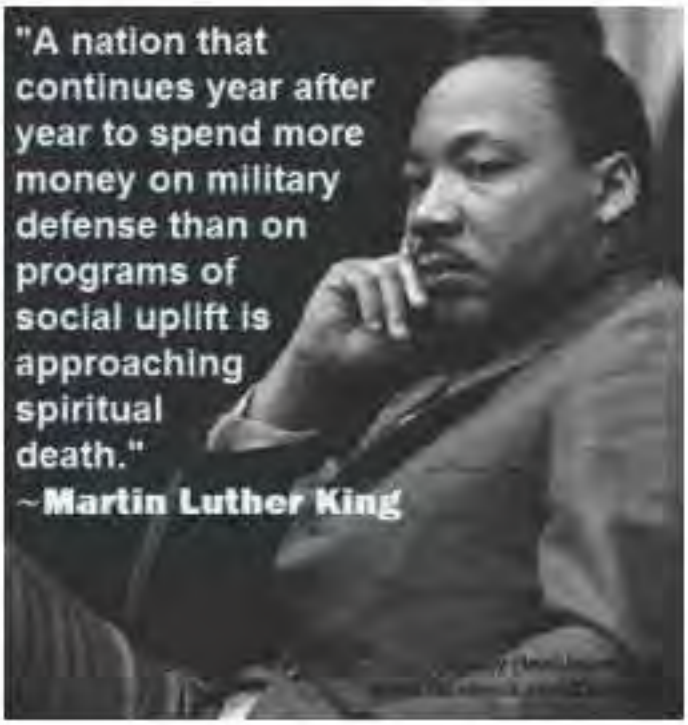
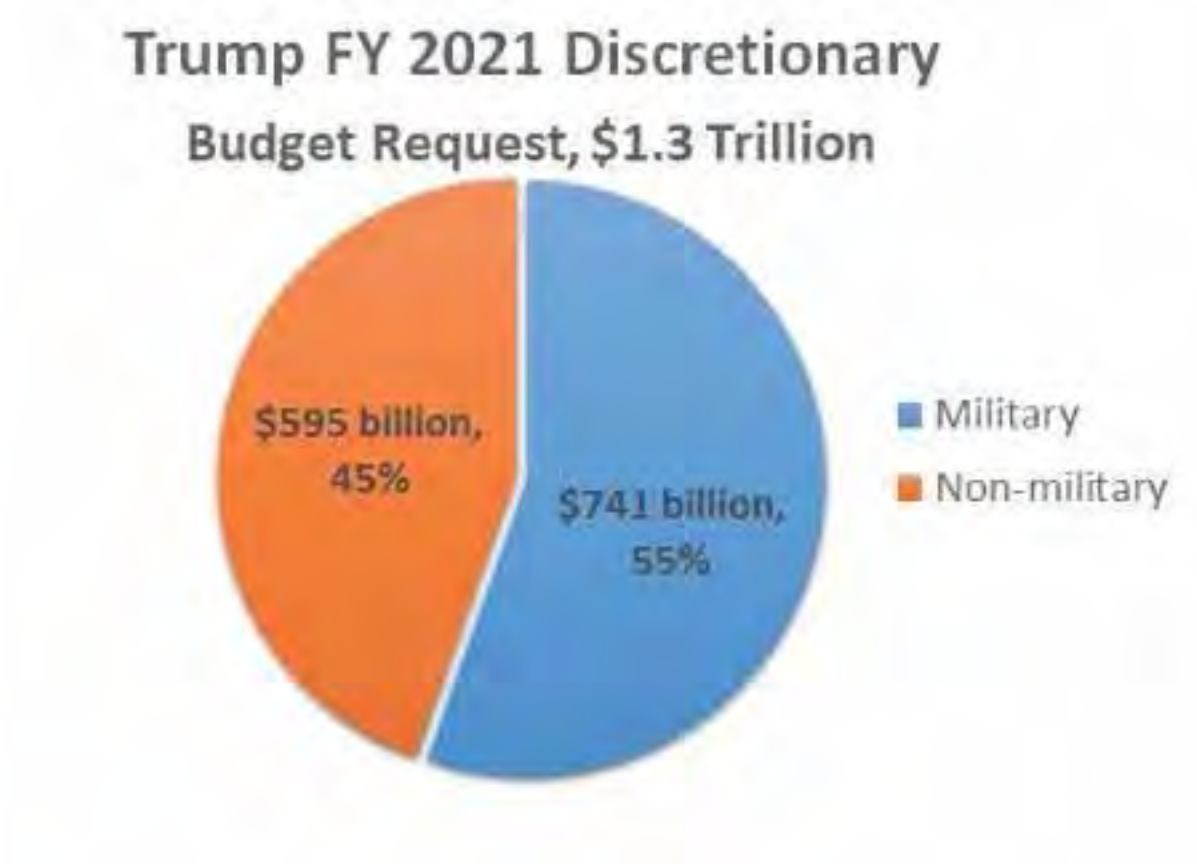
Finally, we must remember the famed World War 2 General and USA President Dwight Eisenhower's famous words, "Every gun that is made, every warship launched, every rocket fired signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and are not clothed. This world in arms is not **spending** money alone."

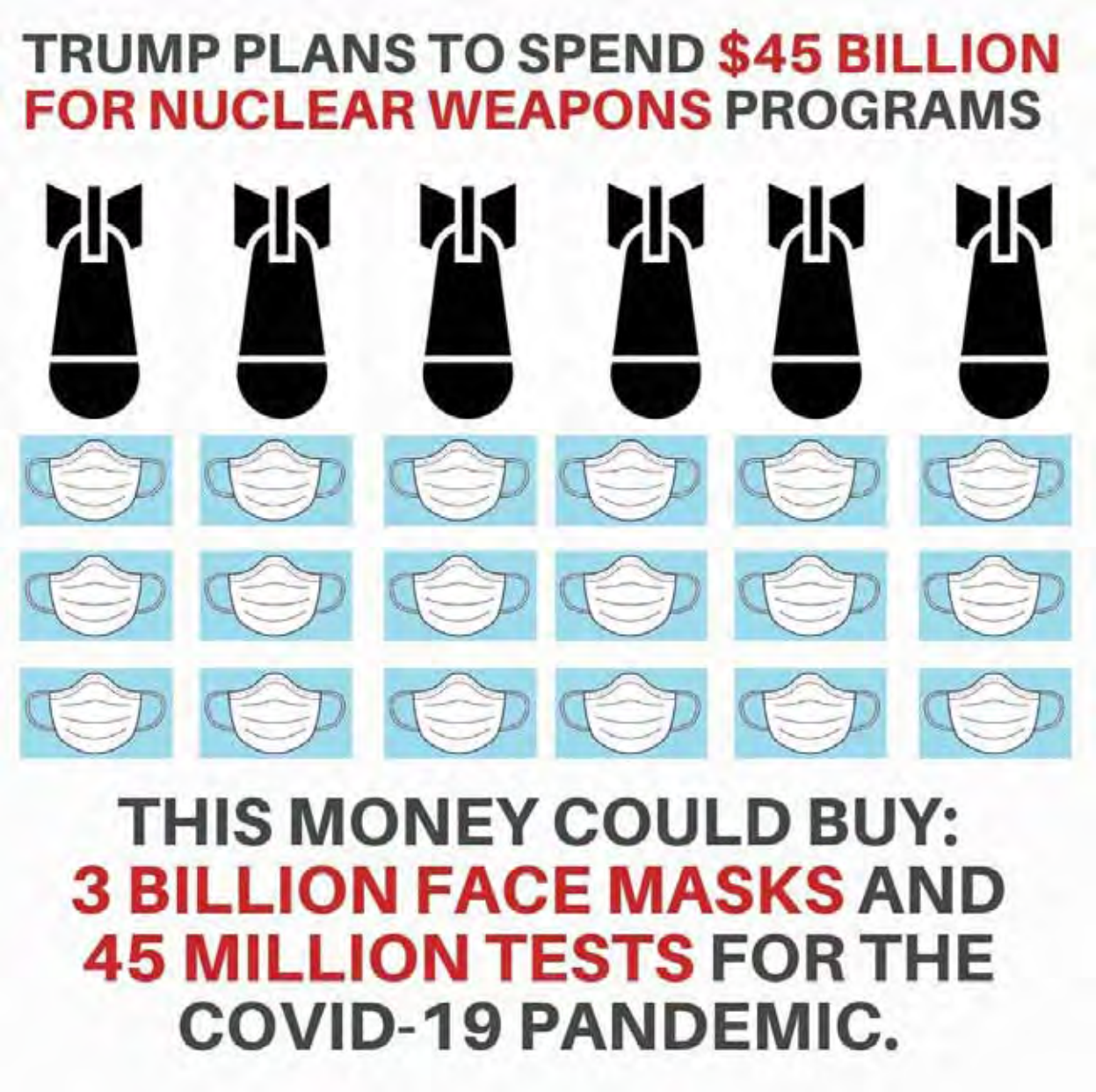
1/5-a

[redacted]


"A nation that continues year after year to spend more money on military defense than on programs of social uplift is approaching spiritual death."
~Martin Luther King


Majority of millennials support banning nuclear weapons


Trump FY 2021 Discretionary
Budget Request, $1.3 Trillion
$595 billion, 45%
$741 billion, 55%
Military
Non-military


TRUMP PLANS TO SPEND $45 BILLION FOR NUCLEAR WEAPONS PROGRAMS
THIS MONEY COULD BUY:
3 BILLION FACE MASKS AND
45 MILLION TESTS FOR THE
COVID-19 PANDEMIC.

From: Mary Swain <maryswain@lorettocommunity.org>
Sent: Saturday, May 30, 2020 8:13 AM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL]

Dear Ms. Nelson,
I am writing to oppose plutonium pit production at the Savannah River Site in South Carolina—the No Action Alternative in the Draft EIS. In addition, I believe the NNSA must complete a new Programmatic EIS before it can prepare a site-specific Environmental Impact Statement. The PEIS must fully analyze the reuse of the 15,000+ plutonium pits in storage at Pantex before it embarks on a dangerous, multi-billion dollar plan to build an unnecessary new bomb plant.
I was alive for Hiroshima and Nagasaki. We cannot head in that direction again.
Mary Swain
Loretto Motherhouse
Nerinx KY 40049

1/5-a
2/4-f
3/1-b

1

From: Mary Swain <maryswain@lorettocommunity.org>
Sent: Sunday, May 31, 2020 4:39 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] plutonium pits

Dear Ms. Nelson,
Stop, stop. We cannot be building all these parts for nuclear bombs. This is insanity acting. Stop the actions. 1/5-a
Mary Swain
Loretto Motherhouse
Nerinx KY 40049

From: Lucy J Swanson <janeslo@icloud.com>
Sent: Saturday, May 30, 2020 5:08 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Cc: Swanson Lucy Jane <janeslo@icloud.com>
Subject: [EXTERNAL] Draft SRS Pit Production EIS Comment

Ms. Jennifer Nelson
NEPA Compliance Officer
National Nuclear Security Administration
Savannah River Field Office, P.O. Box A
Aiken, South Carolina 29802
NEPA-SRS@srs.gov

Dear Ms. Nelson

I am writing to oppose plutonium pit production at the Savannah River Site in South Carolina—the No Action Alternative in the Draft EIS. In addition, I believe the NNSA must complete a new Programmatic EIS before it can prepare a site-specific Environmental Impact Statement. The PEIS must fully analyze the reuse of the 15,000+ plutonium pits in storage at Pantex before it embarks on a dangerous, multi-billion dollar plan to build an unnecessary new bomb plant. 1/5-a 2/4-f 3/1-b

The US has more than 4,000 nuclear warheads in the stockpile right now. They are all certified reliable, and will be for at least 50 more years. There is no need to replace plutonium pits—so there is no need to make more.

Lucy Jane Swanson
janeslo@icloud.com

313 Presidio Place
San Luis Obispo, CA 93401

1

-----Original Message-----
From: info@scchamber.net <info@scchamber.net> On Behalf Of South Carolina Chamber of Commerce
Sent: Tuesday, June 2, 2020 4:25 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] Form submission from: Plutonium Pit Production Comments

Submitted on Tuesday, June 2, 2020 - 16:24 Submitted by anonymous user: 12.13.49.4 Submitted values are:

Name: Joe Tate
Company Name: Singh Investment Group - Holiday Inn Augusta West Job Title: General Manager Mailing Address: 441 Park west drive Phone Number: 7063964600 Email Address: joe.tate@singhinvestment.com Use suggested comments? No
Your Comments: Myself Joe Tate, and Singh Investment Group believe that Savannah River Site is the right location for this Pit Production mission will compliment other projects at the site. Savannah River Site has over 70 years of experience safely managing nuclear materials and is more than capable of handling important new national security missions. The many employees who work at SRS are our neighbors, actually over 1400 employees live in Columbia County, and we believe SRS employees are experts in this industry. By creating new jobs and maintaining current jobs at the site, this will keep our region growing and thriving. The economic impact of the site is tremendous for our two-state, multiple-county region.

1/5-b

The results of this submission may be viewed at:
https://www.scchamber.net/node/1572/submission/6641

1

From: moses todd <iloveaug93@gmail.com>
Sent: Friday, May 29, 2020 10:37 AM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] With purpose MOX FFF to PIT project

Yes I support repurposing MOX to the PIT project! 1/5-b

1

-----Original Message-----
From: Jim Ullrich <jamesrullrich@gmail.com>
Sent: Tuesday, June 2, 2020 5:22 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] Plutonium Pit bomb plant.

Why are we going to build a plutonium pits bomb plant at Savannah River. The US has more than 15,000 pits from retired warheads in storage at the Pantex plant in Texas. These can be reused saving the taxpayer billions of dollars.The US has more than 4,000 nuclear warheads in stockpile right now. They are all certified reliable and will be for at least the next 50 years.There is no reason to need more so why make more? These pits and nuclear weapons are worthless against the pandemic of a little organism so small we can't even see. Talk about bringing a tank to a turkey shoot. WAKE UP PEOPLE !!

1/1-b
2/1-c

Jim Ullrich
541 English Village Way
Apt 817
Knoxville, TN 37919

1

From: Meira Warshauer <meira.warshauer@gmail.com>
Sent: Tuesday, June 2, 2020 5:41 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] Draft SRS Pit Production EIS Comment

Dr. Meira Warshauer
3526 Boundbrook Lane
Columbia, SC 29206

June 2, 2020

Ms. Jennifer Nelson
NEPA Compliance Officer
National Nuclear Security Administration
Savannah River Field Office, P.O. Box A
Aiken, South Carolina 29802
NEPA-SRS@srs.gov

Subject line: Draft SRS Pit Production EIS Comment

Dear Ms. Nelson:

I hereby submit the following comments on the *Draft Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina* and ask that they be made part of the official record.

I support the "**No Action Alternative.**"

While the DEIS introduction states a NEPA "requirement" to produce 50 pits per year, this is not a legal requirement but rather a policy requirement. It could be reversed with a new administration. Then the SRS could be left dangling with a plant in process that does not get completed. 1/1-b

Even if the policy does not get reversed immediately, it could later be reversed, after more plutonium has been shipped to SRS. As a South Carolinian, I oppose bringing more plutonium to my state. I favor vitrification (immobilization in glass) of the plutonium currently on site instead. 2/5-a 3/4-e

The MOX plant construction was mismanaged and way over budget. Before any new plans for construction or re-furbishing that building for a new project, a thorough investigation needs to take place as to what were the causes of the cost overruns in the previous project. 4/8-d

The SRS has plenty of work to do with clean up, and could develop new models and techniques for cleanup of radioactive materials that could be used elsewhere as we continue the stated goals of the Nuclear Non-proliferation 5/6-j.8 6/2-a 7/6-l.1

Treaty (NPT). I advocate an expansion of the cleanup mission at SRS using and developing new technology for this purpose.

A Pit Production facility would take us in the opposite direction—away from non-proliferation and towards a new nuclear arms race. It would also put my life and home in jeopardy from radiation releases in the event of targeted attack at SRS.

5/6-j.8
6/2-a
7/6-l.1
(Cont'd)

Further harm to my health, home and property could come from contamination of the aquifer under the SRS property. Already, cesium has been found in the Savannah River tributaries coming from the SRS plant. Introducing larger waste streams of chemical and low level nuclear waste from a Plutonium Pit Production Facility would bring more risk, not less. The plan to discharge large volumes of this waste into unlined trenches is particularly troubling.

8/6-j.6

To make matters worse, there has been no demonstrated need for this pit production. I understand there are already 15,000 pits in storage at DOE's Pantex site in Texas. Why is this not addressed in the DEIS? Why has the DOE decided not to re-use or refurbish any of these pits? I request a detailed investigation into this issue before considering any new construction and the problems and risks that the new project brings.

9/3-a
1/1-b
(Cont'd)

For these reasons, I support preparation of an over-arching, legally mandated **Programmatic Environmental Impact Statement (PEIS)**which would examine the need for expanded pit production and the role in program support, pit design, pit production and waste handling at DOE sites across the country, including SRS, Los Alamos, Pantex, Y-12, the Waste Isolation Pilot Plant, Sandia, the Nevada Nuclear Security Site, and the Kansas City National Security Campus (which supplies non-nuclear components for all nuclear warheads). The PEIS must be completed before the final EIS on SRS pit production or the Supplement Analysis on pit production at Los Alamos are finalized. NNSA's plans for SRS and Los Alamos are inextricably linked and those plans must should be reviewed in a single document, the legally required PEIS.

10/4-f

Thank you for considering my comments and for responding to them. Please confirm receipt of these comments.

Sincerely,
Meira Warshauer

Meira.warshauer@gmail.com
Columbia, South Carolina

Meira Warshauer
http://meirawarshauer.com/

https://www.facebook.com/MeiraWarshauerComposer/
https://www.instagram.com/meirawarshauercomposer/

803-546-9359

June 2, 2020

Ms. Jennifer Nelson
NEPA Compliance Officer
National Nuclear Security Administration
Savannah River Field Office, P.O. Box A
Aiken, South Carolina 29802
NEPA-SRS@srs.gov

Subject: Draft EIS-0541 for SRS Plutonium Pit Production at the Savannah River Site in South Carolina

Dear Ms. Nelson:

I hereby submit the following comments on the *Draft Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina* and ask that they be made part of the official record. Please acknowledge receipt of my comments.

I have outlined several major concerns about the National Nuclear Security Administration (NNSA) proposal to repurpose the Savannah River Site mixed oxide fuel facility for the production of plutonium pits. The new mission poses serious environmental, health and safety challenges.

1. A Programmatic Review of Expanded Pit Production is Necessary

The National Nuclear Security Administration's (NNSA) plan to expand U.S. plutonium pit production to 80 or more new bomb cores per year is based on two production facilities, the Savannah River Site in SC and the Los Alamos National Lab in NM.

NNSA, however, has listed seven additional sites that are integral to its plan to expand pit production. They are: the Waste Isolation Pilot Plant in NM, the Lawrence Livermore National Lab in CA, the Nevada Nuclear Security Site, the Kansas City National Security Campus, the Y-12 National Security Complex in TN, the Pantex Plant in TX, and the Sandia National Labs in NM and CA, for a total of nine facilities scattered across the United States.

Rather than taking a hard look at the full picture as required by the National Environmental Protection Act, the NNSA has inappropriately fragmented its environmental review. This DEIS, which focuses solely on the Savannah River Site, is the *only* Environmental Impact Statement that NNSA is presently undertaking on this project.

1/4-f

This situation must be remedied. Prior to issuing a final DEIS on the Savannah River Site or a Supplemental Analysis on expanded pit production at Los Alamos lab, a comprehensive nationwide assessment of all of the interlocking environmental risks posed by new plutonium pit production, from pit design, program support, transportation of nuclear material, and waste disposal, must be prepared.

Therefore, I add my voice to that of Tri-Valley CAREs and other public interest groups to call for the preparation of an overarching Programmatic Environmental Impact Statement (PEIS) that would comprehensively examine the "purpose and need" for expanded pit production at a myriad of sites throughout the nation, and the cumulative environmental impacts of expanded production on all affected communities. Our national security must prioritize first and foremost, the protection of our homeland and all its inhabitants.

2. A "Hard Look" at Additional Alternatives is Required

NNSA's plan to expand pit production is being driven by a new warhead under development at the Lawrence Livermore National Lab, the W87-1.

2/1-g

According to public documents from NNSA, the Government Accountability Office and other federal agencies, this completely new weapon design requires a novel plutonium pit, unlike anything in the current stockpile or in storage. The agency cannot artificially separate the development of new weapons from its need for new pits. 2/1-g (Cont'd)

The DEIS does not adequately analyze a reasonable alternative for the "reuse" of existing pits unattached to a new warhead for their remaining useful life, possibly another 50-100 years. There are some 15,000 to 20,000 plutonium pits in storage at the Pantex Plant, with lesser quantities stored elsewhere. Pit reuse, unlike a novel warhead design, is a proven technology. New weapons coupled with new plutonium pits, on the other hand, will require new testing. 3/3-a 4/2-d

The final DEIS must fully consider the role pit reuse could play before rushing full speed ahead with a new pit production at the Savannah River Site or the expansion of pit production at Los Alamos. This would give NNSA time to develop and implement enhanced safety features to meet NNSA and DoD requirements that do not require the production of new pits.

The DEIS cites costly changes in the weapons delivery systems that use uranium instead of plutonium, but fails to address similar changes in connection with the production of new plutonium pits. 5/6-p.13

A comparative analysis of the environmental, health, and security risks, along with the corresponding monetary costs of producing new pits, as opposed to the reuse of existing pits in the nation's stockpile should be conducted in a PEIS, as well as the final EIS for Pit Production at the Savannah River Site. 1/4-f 3/3-a (Cont'd)

The DEIS also highlights the need for more information on the aging of existing plutonium pits, which should become the focal point of a new programmatic review. Until it is known how long existing plutonium pits will remain effective, a perceived need for the production of new pits is transitory and premature. 6/1-c

Adding unproven plutonium pit production capability to the SRS mission will only multiply the environmental risks of maintaining a much larger and variable nuclear stockpile, posing greater national and global safety and security threats. 7/1-h

3. Hazards to Workers and the Public Must Be Disclosed

Industrial scale plutonium pit production last took place at the Rocky Flats Plant in CO. It was shut down in 1989 following a raid by the FBI environmental crimes unit and the EPA. Pit production at Los Alamos was also forced to stop due to safety and security considerations. 8/2-i

A full analysis of how the safety lapses at these facilities will be remedied should have been covered in the DEIS and should be included in a PEIS, prior to issuance of the final EIS for this project.

Plutonium fires at Rocky Flats created airborne pollution for miles around the site, reaching nearby towns and the City of Denver. An analysis of impacts from a plutonium fire at the Savannah River Site should be detailed in the final EIS. 9/6-l.2

The analysis must include site workers, first responders, and downwind communities near the Savannah River Site, including Barnwell, SC and Shell Bluff, GA. The residents of these communities are primarily low-income and historically disadvantaged people of color. What is the plan to safeguard these vulnerable populations? What about cumulative impacts to plant workers that reside in nearby communities? 10/6-i.2

The potential impacts of a nuclear accident at the Savannah River Site, including plutonium fires, on nearby commercial nuclear reactors at Plant Vogtle, across the river in Georgia also requires analysis.

In short, historical accidents at other pit production sites and the potential for similar accidents at SRS point to the need for specific precautionary measures. 11/6-l.3

The DEIS also lacks other information needed to appropriately assess risks. The processes for producing new plutonium pits at the Savannah River Site facility should be defined in more detail in the final EIS. Similarly, a thorough discussion of the specific technology to be used to purify plutonium for new pit production must be included in the final EIS, along with a comparative analysis of the potential health and safety impacts from each process. 12/6-p.1

4. National Security Risks Require Further Analysis

Producing untested new-design nuclear weapons while gradually replacing plutonium pits in the stockpile, could compound the problem of pit aging in both existing nuclear stockpiles and in new design warheads. 2/1-g

Contrary to NNSA's unjustified conclusion that it is appropriate to produce new plutonium pits at a minimum of 80 per year without reliable information on the life expectancy of existing plutonium pits, a decision to produce more plutonium pits must be deferred until the necessary information is obtained. Resources should be redirected to obtain the necessary information by 2030. 4/2-d (Cont'd)

In the interim, the cleanup up of hazardous material at both production sites can be initiated. This will enable baseline environmental assessments to be conducted at both sites prior to the introduction of new hazardous material waste streams. The capacity and legal authority for the storage of hazardous material at various disposal sites throughout the nation can also be addressed in a PEIS. 1/4-f (Cont'd) 13/6-j.8

New design warheads in combination with new pit production could stimulate a costly new global nuclear arms race and nuclear tests in violation of our Nuclear Non-Proliferation Treaty obligations "to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control." 14/2-g 15/2-a

5. Environmental Hazards Must be Fully Analyzed

Pit production at the Savannah River Site would produce a host of chemical and nuclear waste streams. The DEIS analysis of those risks is inadequate. Is dumping of low-level nuclear waste in unlined trenches being considered? Waste containment and management at the Savannah River Site have been problematic; the site was placed on the EPA "Superfund" list in 1989. The final EIS must analyze the cumulative impacts of new production in conjunction with the leaking uncontained wastes that have leaked into the environment. 16/6-j.6

New pit production could distract from the main mission of the Savannah River Site (and its largest source of federal funding) to cleanup tens of millions of gallons of high-level nuclear waste left over from the past production of plutonium and nuclear weapons materials at the site. 13/6-j.8 (Cont'd)

A cleanup budget for past waste production at the SRS, a waste strategy for new pit production, and an evaluation of waste and feedstock transportation impacts to and from other facilities should all be discussed in a PEIS and the final EIS for plutonium pit production at the SRS. 1/4-f (Cont'd) 17/6-m

Climate change impacts to the SRS support infrastructure stemming from localized increases in tornadoes, hurricanes and other extreme weather events should also be analyzed in A PEIS and the final EIS for SRS pit production. 18/6-d.1

Investigations into potential waste, fraud, abuse, and mismanagement at the former the MOX facility should be made public so that the budget and information for new pit production at SRS is not conflated with information stemming from the facility's previous mission. 19/8-d

No waste from past operations or new pit production should ever be placed in unlined trenches. 16/6-j.6 (Cont'd)

Conclusion

In conclusion, I support the "No Action Alternative", eliminating the repurposing of the defective Mixed Oxide Fuel Facility to a plutonium pit production facility in conjunction with pit production at Los Alamos 20/5-a

National Laboratory. While the No Action Alternative would result in sole reliance on LANL for pit production, it would also eliminate duplication of costs, risks and waste. S-17 If this alternative is selected, a PEIS covering the full panoply of sites connected to expanded plutonium pit production should still be conducted.

20/5-a (Cont'd)

Thank you for considering my concerns and for responding to them in the final EIS.

Laura Watchempino
P.O. 407
Pueblo of Acoma, NM 87034

From: Aiken Naacp-President <naacpaikencountypresident@gmail.com>
Sent: Tuesday, June 2, 2020 4:17 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] Comments on the Draft Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina

Dear Ms Nelson:

On behalf of the Aiken County Branch of the NAACP, I am writing to express my support for Plutonium Pit Production at the Savannah River Site in South Carolina. The project offers numerous benefits, as the draft environmental impact statement describes, and offers the very capable team at the Savannah River Site the opportunity to accept and overcome a very unique technical challenge in the Department of Energy complex. We are confident that the team at the Savannah River Site will exceed expectations in this very important national security endeavor. 1/5-b

Of note, our expectation is that the US Department and the Savannah River Site will comply with the conclusions related to Water Resources, Air Quality, Ecological Resources, Socioeconomics, Environmental Justice, Waste Management, Human Health, and Facility Accidents outlined in the following sections:

- Table S-5—Summary Comparison of Direct and Indirect Environmental Impacts
- Table S-6—Summary Comparison of Cumulative Environmental Impacts
- Volume 1 Section 2.6, Comparison of Alternatives
- Volume 1 Section 3.3, Water Resources
- Volume 1, Section 3.4.2, Air Quality
- Volume 1, Section 3.5, Ecological Resources
- Volume 1 Section 3.8, Socioeconomics and Environmental Justice
- Volume 1 Section 3.9, Waste Management
- Volume 1 Section 3.10, Human Health
- Volume 1 Section 3.11, Accident

2/i-2

If there arises a future need for deviations or changes to the information presented in the above sections, we would expect the community to be notified through the appropriate channels.

Of note, the following statement, related to socioeconomics, appears in the tables noted above: "Minimal 'high and adverse' impacts from construction and operations are expected; to the extent that any impacts may be high and adverse, NNSA expects the impacts to affect all populations in the area equally." The sentence reads somewhat ambiguously. A revision would be appreciated for the purpose of clarity to community stakeholders.

We are particularly interested in the environmental justice impacts. Environmental injustice, including the proliferation of climate change, has a disproportionate impact on communities of color and low income communities in the United States and around the world. Decades of studies have proven that environmental racism is a threat to the health and

overall safety of communities across the country. It is our hope that this project can serve a model of how to address environmental justice considerations while successfully completing a project supporting important national security initiatives.

2/i-2
(Cont'd)

Additionally, as the project recognizes the identified socioeconomic benefits related to job creation and economic development, we expect that the US Department of Energy and the Savannah River Site will be intentional in its forming a diverse and inclusive team to ensure that the very best group is assembled to ensure success on this project.

We look forward to serving as a community partner on this vital project, and we wish the US Department of Energy and the Savannah River all the very best in the successful execution of this project.

Sincerely,
Eugene White
Aiken County NAACP President

From: Judith Wouk <bt708@ncf.ca>
Sent: Tuesday, June 2, 2020 10:14 AM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] Comment in Opposition to Plutonium Pit Production Proposed for SRS in the Draft EIS

June 1, 2020

TO:
Ms. Jennifer Nelson
NEPA Document Manager
National Nuclear Security Administation
Savannah River Field Office
P.O. Box A
Aiken, SC 29802

Dear Ms. Nelson,

Plutonium is dangerous; its production, storage, disposal and ownership all wreak havoc. The proposed Plutonium Pit Production Factory planned for the Savannah River Site (SRS) is dangerous and unnecessary. The Cold War ended long ago; we don't need further horrors from radioactive waste. Rather, let's work together as a global community for a positive future with no nuclear weapons, no radioactive pollution and waste, and no threat of war. 1/5-a

Others have pointed out that the National Environmental Policy Act (NEPA) requires analysis of all impacts of a proposed action in an Environmental Impact Statement (EIS). That includes analyzing the impact of its end product, a nuclear weapon, which is wholesale environmental destruction. It also includes analyzing the impacts on national security of a nuclear arms race or from insider sabotage and malevolent acts. The U.S. is out of step with world trends and should be showing leadership in nuclear dismantlement and disarmament, instead of starting a new nuclear arms race. 2/4-g 3/2-g

The idea of converting SRS from a plutonium clean-up site into manufacturing nuclear warhead triggers has been rejected three times. It is timee for a new strategy. I leave it to others to detail what that should be. It must employ local people and protect the low country environment while aiding global security. I urge NNSA/DOE to provide the necessary leadership to get this type of option funded by including it in the EIS. 1/5-a (Cont'd)

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Respectfully submitted,

Judith Wouk
Arlington, Virginia

June 2, 2020

Ms. Jennifer Nelson
NEPA Compliance Officer
National Nuclear Security Administration
NEPA-SRS@srs.gov

Subject line: Draft SRS Pit Production EIS Comment

Dear Ms. Nelson:

The organizations listed below endorse and submit the following comments on the *Draft Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina* and ask that these comments be made part of the official record.

We are concerned about the proposal to expand the role of the Savannah River Site (SRS) into the production of plutonium pits. SRS has no experience producing plutonium pits and this new mission will pose serious environmental, health and safety challenges. Pit production at the Rocky Flats Plant facility in Colorado was shut down in 1989 by a raid of the FBI and the Environmental Protection Agency. Pit production at Los Alamos was also forced to stop due to safety and security considerations. 1/1-h

With that in mind, we raise the following issues that need to be addressed in any final EIS:

- Pit production would produce a host of chemical and nuclear waste streams. Would any low-level nuclear waste be placed in unlined trenches at SRS? Do the waste figures in the draft EIS rely on information from earlier documents not related to pit production at SRS? If so, please provide new calculations based on pit production in the abandoned mixed oxide (MOX) plant. 2/6-j.6 3/4-h

- What impacts would a plutonium fire have on the environment, front-line workers and downwind communities? As you know such a plutonium fire happened in the course of pit production at Rocky Flats. The people of Barnwell, SC and Shell Bluff, GA near SRS are primarily low income, disadvantaged, and people of color. What would happen to them in the event of a fire or accident? 4/6-l.2 5/2-i 6/6-i.2

- The United States has 15,000 or more pits in storage at DOE's Pantex site in TX. In addition, the Department of Energy does not have up-to-date, scientifically grounded information on the expected lifetime of plutonium pits. The most recent data from a 2007 JASON report showed pits would last a minimum of 100 years with appropriate care. The primary justification for pit production seems to be to produce new-design nuclear weapons, at great cost and considerable risk. Please discuss the comparative environmental, health, security and monetary risks and costs of producing new pits versus relying on the pits the United States already has. 7/1-b 8/1-c 9/3-a

- The SRS plan would repurpose the MOX plant, on which at least $5 billion was spent, and which was cancelled due to rising cost estimates and amid allegations of high levels of required re-work due to poor quality construction. Please include a reliable, independently verified cost estimate for this project, and levels of confidence in that estimate. 10/8-d

We support preparation of an over-arching Programmatic Environmental Impact Statement (PEIS) which would examine the need for expanded pit production and the role in program support, pit design, pit production and waste handling at DOE sites across the country, including SRS, Los Alamos, Pantex, Y-12, 11/4-f

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the Waste Isolation Pilot Plant, Sandia, the Nevada Nuclear Security Site, and the Kansas City National Security Campus (which supplies non-nuclear components for all nuclear warheads). The PEIS must be completed before the final EIS on SRS pit production or the Supplement Analysis on pit production at Los Alamos are finalized. NNSA's plans for SRS and Los Alamos are inextricably linked and those plans should be reviewed in a single document, a PEIS.

11/4-f
(Cont'd)

Finally, we support the "no action alternative" whereby the poorly constructed MOX facility would not be converted to plutonium pit production and that this alternative not be linked to pit production at Los Alamos.

Please confirm receipt of these comments to Stephen Young, Washington Representative, Union of Concerned Scientists at syoung@ucsusa.org.

Sincerely,

Arms Control Association
Washington DC

Association of Roman Catholic Women Priests
Sarasota, FL

Baltimore Nonviolence Center
Baltimore, MD

Carolina Peace Resource Center
Columbia, SC

Chesapeake Physicians for Social Responsibility
Baltimore, MD

Citizens for Alternatives to Radioactive Dumping
Dixon, NM

Citizen Power, Inc.
Pittsburgh, PA

Citizens' Resistance at Fermi Two (CRAFT)
Redford, MI

Columbia Friends Meeting (Quakers)
Columbia, SC

Columbia Resilience
Columbia, SC

Don't Waste Arizona
Phoenix, AZ

Green State Solutions
Iowa City, IA

2

Michigan Stop the Nuclear Bombs Campaign
Detroit, MI

Midlands Group of the South Carolina Sierra Club
Columbia, SC

Multicultural Alliance for a Safe Environment
Albuquerque, NM

Mutual Aid Midlands
Columbia, SC

National Nuclear Workers Nuclear Workers for Justice (NNWJ)
Portsmouth, OH

North American Water Office
Lake Elmo, MN

Nuclear Age Peace Foundation
Santa Barbara, CA

Nuclear Watch New Mexico
Santa Fe, NM

Nuclear Watch South
Atlanta, GA

Nukewatch
Luck, WI

On Behalf of Planet Earth
Watertown, MA

Peace Action
Silver Spring, MD

Physicians for Social Responsibility
Arizona Chapter
Tucson, AZ

Physicians for Social Responsibility
Florida
Tampa, FL

Physicians for Social Responsibility
Kansas City
Kansas City, MO

Physicians for Social Responsibility
San Francisco Bay Area Chapter
San Francisco, CA

Physicians for Social Responsibility
National Headquarters
Washington, DC

Physicians for Social Responsibility
Western North Carolina Chapter
Asheville, NC

Portsmouth/Piketon Residents for Environmental Safety and Security (PRESS)
Portsmouth, OH

Prevent Nuclear War Maryland
Baltimore, MD

Rachel Carson Council
Bethesda, MD

Safe Energy Rights Group (SEnRG)
Peekskill, NY

Savannah River Site Watch
Columbia, SC

Stimson Center
Washington, DC

San Luis Obispo Mothers for Peace
San Luis Obispo, CA

Southwest Research and Information Center
Albuquerque, NM

Toledo Coalition for Safe Energy
Toledo, OH

Tri-Valley CAREs
Livermore, CA

Union of Concerned Scientists
Cambridge, MA

Vermont Yankee Decommissioning Alliance
Montpelier, VT

June 2, 2020

Ms. Jennifer Nelson
NEPA Compliance Officer
National Nuclear Security Administration
NEPA-SRS@srs.gov

Subject line: Draft SRS Pit Production EIS Comment

Dear Ms. Nelson:

I submit the following comments on the Draft Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina and ask that these comments be made part of the official record.

These comments are being submitted by Stephen Young, Washington Representative, Global Security Program, the Union of Concerned Scientists, a non-profit, public-interest organization headquartered in Cambridge, Massachusetts. The Union of Concerned Scientists has more than 500,000 supporters and activists across the United States, including thousands in South Carolina and Georgia.

Opening statement: The Union of Concerned Scientists concludes that the United States should develop and retain the ability to produce sufficient quantities of plutonium pits to ensure that it can maintain the knowledge required for such production. It is a priority issue.

However, the current plan to rush to establish pit production will lead to an inevitable failure that will do more to undermine confidence in the stockpile than sustain it. 1/3-e 2/5-c

For that reason, I recommend that the Draft Environmental Impact Assessment be set aside, and a basic reassessment of stockpile requirements be undertaken.

Two fundamental points must be made.

First, the NNSA is required by law to produce a minimum of 80 pits per year by 2030, but that requirement is based on expectations for the lifetime of plutonium pits from now dated information. The source was JASON's 2007 report which concluded "the primaries of most weapons system types in the stockpile have credible minimum lifetimes in excess of 100 years and that the intrinsic lifetime of Pu in the pits is greater than a century." That minimum age would also apply to the remaining types once straightforward adjustments were made. 3/1-c

However, that information is now 14 years old, and has not been independently verified since 2006. Congress sought to correct that information deficit by requiring JASON to update its earlier work. Unfortunately, JASON's very brief "letter report" was unable to provide a new estimate for pit lifetimes.

Why? Because the NNSA was not able to provide new data that *should* be available. JASON lays the blame for this failure squarely on the NNSA, declaring that "in general, studies on Pu aging and its impacts on the performance of nuclear-weapon primaries have not been sufficiently prioritized over the past decade."

Based on accelerated aging studies, there should be sufficient information to update the data from 2006. And indeed, we know that some new data is available: as far back as 2012, Livermore National Laboratory reported that plutonium would not age significantly for at least 150 years. Following publication of that report, Los Alamos National Laboratory quickly weighed in to say that plutonium aging is not the same at pit aging. While that is true, the labs should have also been conducting studies that would allow revised estimates on pit lifetime. Clearly, the JASON report indicates that has not been the case.

3/1-c (Cont'd)

Instead of studying pit lifetimes, the NNSA has focused on major upgrades for three existing nuclear weapons, a new uranium processing facility and, notably, one weapon that will require a new plutonium pit – the W87-1, and one all-new nuclear weapon, the W93—the first since the end of the Cold War—that will require production of new plutonium pits.

That brings us to the second fundamental point: the NNSA has not demonstrated it can reliably produce *any* plutonium pits, nor that is has the ability to complete major projects on time or on budget.

The NNSA and Los Alamos National Laboratory have had continued, multi-year problems seeking to achieve limited production of plutonium pits. As widely noted, after producing a relatively small number of pits between 2007 and 2012, the NNSA was forced to shut down production at Los Alamos in 2013, and only began to produce one or two demonstration pits per year again three years later.

In that context, a May 2019 independent study mandated by Congress found that the current timeline and cost estimate for pit production are not realistic. The study by the Institute for Defense Analyses (IDA) concluded that the 80 pits per year goal was "*potentially* achievable given sufficient time, resources, and management focus, *although not on the schedules or budgets currently forecasted*…. Put more sharply, eventual success of the strategy to reconstitute plutonium pit production is *far from certain*." (Emphasis added.)

2/5-c (Cont'd)

In other words, producing 80 pits per year *may* be possible, but it will not happen by 2030 and it will cost more than current projections.

Notably, the IDA also reported that, in looking at the NNSA's history, they "could find no successful historical major project" – one costing more than $700 million - that was completed in less than 16 years. Yet NNSA is planning to increase pit production capacity from zero to a total of 80 pits per year by completing two *different* major projects, all in just 10 years. That is simply not a realistic or achievable objective.

As a result of these two fundamental points, it is clear that what is required is not a rushed effort, almost certainly doomed to failure, to produce 80 pits per year by 2030.

Instead, what is needed is a ground-up assessment of the necessity of pit production based on:

1. a detailed analysis of pit lifetimes;
2. increased consideration of the feasibility of pit reuse;
3. a demonstrated, sustained capability by Los Alamos to produce a small number of pits over multiple years; and
4. a comprehensive effort to explain to Congress and to the Department of Defense that setting arbitrary, near-term deadlines and excessive production numbers will not magically lead to the achievement of those goals.

1/3-e
(Cont'd)

Once that assessment has been done and an achievable, sustainable and affordable plan for maintaining the U.S. nuclear stockpile been established, then and only then should Congress, the Pentagon, the White House and the NNSA determine a suitable and sensible schedule for pit production.

Based on that analysis, this Draft Environmental Impact Study should be set aside until an assessment from the ground-up has been completed.

Sincerely,

Stephen Young

Stephen Young, Washington Representative
Global Security Program
Union of Concerned Scientists

Blue Ridge Environmental Defense League

www.BREDL.org PO Box 88 Glendale Springs, North Carolina 28629 BREDL@skybest.com (336) 982-2691

June 2, 2020

Jennifer Nelson, NEPA Document Manager
National Nuclear Security Administration
Savannah River Field Office
PO Box A
Aiken, SC 29802
NEPA-SRS@srs.gov

RE: DOE/EIS-0541: Draft EIS for Plutonium Pit Production at Savannah River Site

Dear Ms. Nelson:

On behalf of the Blue Ridge Environmental Defense League and its supporters, I submit the following comments. Recently, we have gathered national and international support from organizations and individuals who also oppose nuclear weapon warhead manufacture at the Savannah River Site. Indeed, we are convinced that such manufacture would violate treaties and international law no matter the location. This letter incorporates and supplements our comments made orally at the virtual public hearing held on April 30, 2020, and in writing on May 18, 2020. As set forth then and now, we advocate the No Action Alternative; i.e., no plutonium pit warhead production.

Background

Pursuant to the National Nuclear Security Administration's Notice of Intent signed on May 31, 2019 and noticed in the Federal Register published on April 3, 2020 (85 FRN 18947), the US Department of Energy National Nuclear Security Administration has prepared a draft environmental impact statement (EIS) that evaluates the potential environmental impacts of "producing a minimum of 50 war reserve pits per year at SRS and developing the ability to implement a short-term surge capacity to enable NNSA to meet the requirements of producing pits at a rate of not less than 80 war reserve pits per year beginning during 2030 for the nuclear weapons stockpile." The April 3rd notice references the United States 2018 Nuclear Posture Review.

Organizations and Individuals Opposing Nuclear Weapons

The following list of organizations and/or individuals responded to our request for support of our May 18, 2020 comments opposing plutonium weapons manufacture.

The Hawai'i Institute for Human Rights is dedicated to promoting Human Rights principles and creating a culture of Peace through education by implementing civil, political, social, economic, cultural and environmental rights and fostering international public law instruments. Joshua Cooper joshuacooperhawaii@gmail.com 5/26/20

Esse quam videri

The Treaty Compliance Campaign: raising awareness and building a national movement in the US to support international treaties and agreements needed to save this planet. The campaign aims to put financial and public relations pressure on the companies that continue to profit from nuclear weapons, fossil fuels and the widening gap between rich and poor.
David Grant, david67grant@gmail.com Baltimore, Maryland, 5/26/20

Oregon PeaceWorks: supports your May 18 comments on the Draft EIS for Plutonium Pit Production at the Savannah River Site in South Carolina. Oregon PeaceWorks Educating and Activating People to Work for Peace, Justice and Environmental Protection, Peter Bergel pbergel@igc.org Salem, Oregon, 5/26/20

Pax Christi Metro New York: provides a community for Catholic New Yorkers where peacemaking is paramount within the context of their faith. It offers support, instruction, and inspiration. Please add Pax Christi Metro New York to the signers of this letter.
Rosemarie Pace, Director info@nypaxchristi.org 5/27/20

Proposition One Campaign for a Nuclear Free Future: founded in 1990 to bring a voter initiative for global nuclear weapons abolition and conversion of the war machines to provide for human needs to the people of Washington DC.
Ellen Thomas, etprop1@me.com 5/27, 20

Parlement des jeunes Leaders de la Société Civile Guinéenne: Défendre l'idéal citoyen qui est le libre exercice des droits de l'Homme, l'accès à des conditions de vie décentes et équitables pour tous, l'éducation, la justice et la sécurité
Thierno abdoul Bah, thiernoabdoulb@gmail.com Conakry, Guinea 5/27/20

Western North Carolina Chapter of Physicians for Social Responsibility: medical and public health voice working to prevent the use or spread of nuclear weapons.
Lewis Patrie, patrie.wncpsr@main.nc.us Asheville, North Carolina, 5/27/20

NuclearBan.US: committed to the total elimination of nuclear weapons and the use of all those wasted human, financial and political resources to finally and seriously address the climate crisis and global inequality.
David Grant, david67grant@gmail.com Baltimore, Maryland 5/26/20

Pax Christi San Antonio: works with all organizations in the city that promote peace and justice for all peoples. Please sign on Pax Christi San Antonio.
Karen Ball, bluebonnetkaren@gmail.com San Antonio, Texas

Esse quam videri

The Manufacture of New Atomic Weapons is Illegal and Counterproductive

International treaty obligations and U.S. law prohibit further development of atomic weapons. The Nuclear Non-proliferation Treaty (NPT) compels the United States to end nuclear weapons development. The preamble to the treaty is unequivocal in its purpose:

> Declaring their intention to achieve at the earliest possible date the cessation of the nuclear arms race and to undertake effective measures in the direction of nuclear disarmament…to seek to achieve the discontinuance of all test explosions of nuclear weapons…the establishment and maintenance of international peace and security are to be promoted with the least diversion for armaments of the world's human and economic resources.

The Nuclear Non-proliferation Treaty specifically requires that:

> Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.[1]

1/2-a

Plutonium pit production would take us in the opposite direction, making good faith negotiations impossible. In 2006 the Defense Science Board issued a report which sought to justify an expanded nuclear weapons production complex:

> Nuclear capabilities remain an essential element of U.S. national security strategy and defense posture. The knowledge needed to create the power and destructive potential of nuclear weapons is widespread and is a continuing fact of life. Global abolition of these capabilities is a naïve hope. Consequently, the effective implementation of U.S. national security strategy in the 21st century requires nuclear capabilities adequate to the task of continuing deterrence in a dynamic world where the emergence of new and diverse threats makes the deterrence task more complex and less certain.[2]

In the 2018 Nuclear Posture Review, the policy argument turns up again, this time with a commitment to reignite the Cold War:

> We must look reality in the eye and see the world as it is, not as we wish it to be.… To this end, this review confirms the findings of previous NPRs that the nuclear triad…is the most cost-effective and strategically sound means of ensuring nuclear deterrence….To remain effective, however, we must recapitalize our Cold War legacy nuclear forces.[3]

2/2-e

[1] Article VI, Treaty on the Non-Proliferation of Nuclear Weapons
[2] Report of the Defense Science Board Task Force on Nuclear Capabilities Report Summary, Office of the Under Secretary of Defense For Acquisition, Technology, and Logistics, Washington, DC, December 2006
[3] 2018 Nuclear Posture Review, Secretary's Preface, page II

The NPT does not seek to abolish "knowledge needed to create the power and destructive potential of nuclear weapons," and world leaders are no more naïve today than they were in 1969. Moreover, a posture review does not alter the facts or supersede the law. The 180 nations who have signed the treaty understand it and are watching what we do. Perilous and uncertain times call for leadership, not an arms race. The United States of America cannot hold the high moral standard in one hand while keeping the other hand behind its back with fingers crossed.

The National Nuclear Security Administration has been given a dangerous new mission based not on need but on hubris.

> "Let it be an arms race," the president in waiting was reported to have told Mika Brzezinski, co-host of MSNBC's Morning Joe programme, in an early phone call on Friday. According to Brzezinski he went on to say: "We will outmatch them at every pass and outlast them all." The incendiary comment followed a tweet on Thursday in which Trump threatened to preside over a major ramping up of the US nuclear arsenal. "The United States must greatly strengthen and expand its nuclear capability until such time as the world comes to its senses regarding nukes," he wrote. The volley of remarks had Trump aides scrambling into damage limitation mode, but their efforts were powerless to neutralise the shock waves of alarm and bewilderment provoked by the president-elect's remarks. They appeared to fly in the face of 35 years of bipartisan US policy geared towards reducing the number of nuclear weapons around the world. Nuclear arms specialists were quick to cry foul. "It is irresponsible and reckless for the president elect to be articulating future US nuclear policy in a tweet and on a morning news show," said Daryl Kimball, executive director of the independent Arms Control Association.[4]

2/2-e
(Cont'd)

One month after this statement, on January 27, 2017, the President directed the Department of Defense to conduct a Nuclear Posture Review. The 2018 NPR parroted the president, calling for a new arms race with the manufacture of no fewer than 80 plutonium warhead pits per year by 2030 at SRS. The basis for the Review is suspect because it was prompted by a decision made in the first few days of the new Administration, not on new information.

Conclusion

Pursuant to the National Environmental Policy Act—Section 102 42 U.S.C. 4332—DOE/NNSA must take a systematic, interdisciplinary approach to environmental impact on the human environment. The draft EIS posits two alternatives: 1) Proposed Action to repurpose the mixed oxide fuel fabrication facility into the Savannah River Plutonium Processing Facility to produce a minimum of 50 pits per year; and 2) No Action Alternative. Alternative number two is the only acceptable option. The April 3rd Federal

3/5-a

[4] "'Let it be an arms race' Donald Trump appears to double down on nuclear expansion." *The Guardian*, published December 24, 2016 and accessed 7/23/2019 at https://www.theguardian.com/us-news/2016/dec/23/donald-trump-nuclear-weapons-arms-race

Register states: "Plutonium pits are critical components of every nuclear weapon, with nearly all current stockpile pits having been produced from 1978-1989. Today, the United States' capability to produce plutonium pits is limited." Good. This condition is in accord with the Nuclear Non-proliferation Treaty. It is a logical, humane end of the 20th Century's nuclear arms race.

3/5-a
(Cont'd)

Respectfully submitted,

Louis Zeller, Executive Director
Blue Ridge Environmental Defense League
PO Box 88 Glendale Springs, NC 28629
(336) 982-2691
BREDL@skybest.com

Esse quam videri

From: Kathleen Kempe <kempeka@yahoo.com>
Sent: Sunday, May 31, 2020 2:08 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] opposition to plutonium pits at SRS

Ms. Jennifer Nelson, NEPA Document Manager May 31, 2020

NNSA, Savannah River Field Office

P.O. Box A

Aiken, SC 29802

NEPA-SRS@srs.gov

Dear Ms. Nelson:

I support "A No Action Alternative" regarding the construction of plutonium pits at SRS. 1/5-a

If DOE continues to pursue this mission, I urge a comprehensive Programmatic Environmental Impact Study (PEIS) of this proposed new pit mission at SRS. 2/4-f

I oppose this proposal to build plutonium pits at the Savannah River Site (SRS) for the following policy reasons:

(1) I support the "No Action Alternative." The goal of the Nuclear Non-proliferation Treaty (NPT) is to end nuclear weapons development. I actively supported the NPT in the 1960s, and continue to do so: "Declaring their intention to achieve at the earliest possible date the cessation of the nuclear arms race and to undertake effective measures in the direction of nuclear disarmament." For more than three decades the NPT has demonstrated the 3/2-a

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world's possibility to control much proliferation. There is no new information to support this proposal. To the contrary, this nation's interest in "refreshing" weapons systems has stimulated nuclear arms activities in the international community. 3/2-a (Cont'd)

(2) I have been monitoring the very slow progress in cleanup of legacy wastes at SRS for almost 40 years. These wastes are in 43 old ~Olympic-pool-sized underground tanks. The most recent closure was last December, and the next tank closure seems to be scheduled for 2024. Decades will be required to clean what can be cleaned from these troublesome tanks, and to close what can be closed. This EIS fails to address costs, processes, and schedules for treating the additional wastes to be generated by this competing proposal – which triples some of the existing volumes of untreated legacy wastes currently at SRS. Post-pit cleanup management is not fully addressed. 4/6-j.8

The EIS is insufficient. If DOE persists, a PEIS for the pit proposal at SRS should address:

(1) On-site and off-site contamination at other DOE sites charged with this mission, and analyses to avoid such releases at SRS or elsewhere in the future. 2/4-f (Cont'd)

(2) Effects on staffing and scheduling of the proposed new mission on current SRS cleanup schedule programs and responsibilities, especially legacy underground tank closures. 4/6-j.8 (Cont'd)

(3) A candid assessment of stockpiles of plutonium at all DOE sites and their lifetimes, as judged by independent professionals. 5/1-b

(4) Detailed description, cost, and schedule of safe management and treatment of pits wastes for indefinite storage at SRS until such time as shipment to a suitable federal repository becomes a possibility. 6/6-j.9

(5) If WIPP disposal is part of the PEIS, how many and which federal facility wastes will be "bumped" to enable both the current planned SRS shipments as well as this proposed new volume of SRS TRU storage at WIPP. 7/6-o.1

(6) The plan for the future of the newly imported 'pits' plutonium if the billions of appropriations necessary to produce pits does not receive sufficient and steady funding by Congress. 8/6-h.3

(7) Given the difficulty of hiring skilled professional staff and obtaining specialized materials, as demonstrated during the construction of the MOX shell, what is the plan for workforce adequacy over the next 30 years - in a less-than-resilient industrial environment. 9/6-h.2

(8) Having experienced serious MOX financial and scheduling problems with the similar huge and hurried "design/build/redesign/rebuild…" project, why should 11/3-j

2

DOE not expect similar financial and scheduling problems with this new proposal? Why does DOE assume the MOX shell is in fact suitable for this purpose? Why another hurried project?

11/3-j
(Cont'd)

Sincerely,

Kathleen Kempe
8 Juneberry Ct.
Greer, SC 29651
kempeka@yahoo.com

From: sobczakr@yahoo.com <sobczakr@yahoo.com>
Sent: Sunday, May 31, 2020 2:11 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>
Subject: [EXTERNAL] opposition to plutonium pits at SRS

Ms. Jennifer Nelson, NEPA Document Manager May 31, 2020

NNSA, Savannah River Field Office

P.O. Box A

Aiken, SC 29802

NEPA-SRS@srs.gov

Dear Ms. Nelson:

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support this proposal. To the contrary, this nation's interest in "refreshing" weapons systems has stimulated nuclear arms activities in the international community. 3/2-a (Cont'd)

(2) I have been monitoring the very slow progress in cleanup of legacy wastes at SRS for almost 40 years. These wastes are in 43 old ~Olympic-pool-sized underground tanks. The most recent closure was last December, and the next tank closure seems to be scheduled for 2024. Decades will be required to clean what can be cleaned from these troublesome tanks, and to close what can be closed. This EIS fails to address costs, processes, and schedules for treating the additional wastes to be generated by this competing proposal – which triples some of the existing volumes of untreated legacy wastes currently at SRS. Post-pit cleanup management is not fully addressed. 4/6-j.8

The EIS is insufficient. If DOE persists, a PEIS for the pit proposal at SRS should address:

(1) On-site and off-site contamination at other DOE sites charged with this mission, and analyses to avoid such releases at SRS or elsewhere in the future. 5/4-f

(2) Effects on staffing and scheduling of the proposed new mission on current SRS cleanup schedule programs and responsibilities, especially legacy underground tank closures. 6/6-j.8

(3) A candid assessment of stockpiles of plutonium at all DOE sites and their lifetimes, as judged by independent professionals. 7/1-b

(4) Detailed description, cost, and schedule of safe management and treatment of pits wastes for indefinite storage at SRS until such time as shipment to a suitable federal repository becomes a possibility. 8/6-j.9

(5) If WIPP disposal is part of the PEIS, how many and which federal facility wastes will be "bumped" to enable both the current planned SRS shipments as well as this proposed new volume of SRS TRU storage at WIPP. 9/6-o.1

(6) The plan for the future of the newly imported 'pits' plutonium if the billions of appropriations necessary to produce pits does not receive sufficient and steady funding by Congress. 10/6-h.3

(7) Given the difficulty of hiring skilled professional staff and obtaining specialized materials, as demonstrated during the construction of the MOX shell, what is the plan for workforce adequacy over the next 30 years - in a less-than-resilient industrial environment. 11/6-h.2

(8) Having experienced serious MOX financial and scheduling problems with the similar huge and hurried "design/build/redesign/rebuild…" project, why should DOE not expect similar financial and scheduling problems with this new 12/3-j

2

proposal? Why does DOE assume the MOX shell is in fact suitable for this purpose? Why another hurried project?

12/3-j
(Cont'd)

Sincerely,

Ronald Sobczak
8 Juneberry Ct.
Greer, SC 29651
sobczakr@yahoo.com

SRS WATCH

Savannah River Site Watch

June 1, 2020

Mailed, with attachments & emailed:

Ms. Jennifer Nelson
NEPA Compliance Officer
National Nuclear Security Administration
Savannah River Field Office
P.O. Box A
Aiken, SC 29802
NEPA-SRS@srs.gov

Re: Draft SRS Pit Production EIS – on Proposed SRS Plutonium Bomb Plant (PBP)

Comments on DOE's National Nuclear Security Administration's *Draft Environmental Impact Statement on Plutonium Pit Production at Savannah River Site; Aiken, South Carolina*

In Bizarre, Dangerous Twist, Facility at SRS Once Endlessly Touted as Pinnacle of Nuclear Non-Proliferation – MOX - Is Transformed into Factory for Proliferation & New Nuclear Arms Race

By Tom Clements, Director, Savannah River Site Watch, Columbia, SC, https://srswatch.org/

Draft EIS on Proposed SRS Plutonium Bomb Plant (SRS PBP) is posted here on NNSA's website: https://www.energy.gov/nepa/downloads/doeeis-0541-draft-environmental-impact-statement

Federal Register notice, April 3, 2020 *Notice of Availability of Draft Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina and Announcement of Public Hearing*: https://www.govinfo.gov/content/pkg/FR-2020-04-03/pdf/2020-06557.pdf

DOE Ignores COVID-19 Threat, Diverts Resources to Planning for Nuclear War by Releasing Draft Environmental Study on SRS Plutonium Bomb Plant, April 3, 2020, news release by SRS Watch, Nuclear Watch New Mexico and Tri-Valley CARES, member groups of the Alliance for Nuclear Accountability: https://nukewatch.org/newsite/wp-content/uploads/2020/04/SRS-EIS-PR-4-3-20.pdf

These comments on the proposed SRS Plutonium Bomb Plant (PBP) and attachments are being submitted by Tom Clements, director of Savannah River Site Watch (SRS Watch), a non-profit, public-interest organization located in Columbia, South Carolina. I request that every comment and observation contained herein and information in the attachments be responded to in any

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final EIS, if such a document were to be issued. If any lawsuit under the National Environmental Policy Act (NEPA) were to develop on the pit issue, meticulous, detailed responses to these comments and attachments, especially regarding the legally required PEIS, are anticipated.

I formally repeat my request for this draft EIS record, as submitted in the *Draft Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory for Plutonium Operations,* DOE/EIS-0380-SA-06**.** A response is urgently needed:

> **NOTE: A FORMAL REQUEST is hereby being made for a supplement to the Supplement Analysis or a revised draft SA to be prepared on the issues of 1) reuse of plutonium pits in new and refurbished nuclear warheads and 2) production of purified plutonium for production of new pits. Both issues can be discussed in a single supplement document or a revised or edited supplement to the draft SA released for public comment. These matters are too important and the discussion about them is of such legal significance for them to simply be somehow included in any final SA without opportunity for public comment. See details in comments which follow. A discussion of these matters could also be contained in the required Programmatic Environmental Impact Statement (PEIS). A formal response from NNSA to this request is expected in the short term.**

1/8-e
2/3-a
3/6-p.3
4/4-f
5/4-e

The above requested supplement must be prepared as the issues raised in my comments on the draft SA are inextricably intertwined with this draft EIS: plutonium pit "reuse" and production of purified plutonium for pits, plutonium disposal and a new sodium-cooled nuclear reactor that DOE has proposed. Inexplicably, my request has so far been ignored. Please respond at srswatch@gmail.com.

SRS Watch notes that the highly complex and costly SRS pit project is being rushed, which raises red flags about its fate. The project currently is at the Critical Decsion-0 level and no massive financial resources have yet been prematurely committed. No Critical Decsion-1 has yet been made about going forward with the Plutonium Bomb Plant or not but the NNSA administrator said before the COVID-19 situation that the CD-1 decision could be coming in September 2020.

The DOE's Fermilab, Office of Support Services, has posted these things below as compromising a CD-1 decision - https://opss.fnal.gov/critical-decision-overview/ - which are now lacking and thus the project can be halted before the CD-1 point is reached or halted before the waste of more taxpayer money to implement the CD-1 and subsequent decisions.

> **What is the function of CD-1?**
>
> CD-1 serves as a determination that the selected alternative and approach is optimized to meet the mission need defined at CD-0. Key elements of the

evaluation are the project's conceptual design, cost and schedule range, and general acquisition approach. The cost range allows for uncertainty in the estimates and scope options such as a range of capabilities.

What is a project expected to prepare for CD-1 approval?

- An analysis demonstrating that the proposed alternative is the correct one.
- A complete and independently reviewed conceptual design of a chosen alternative and associated cost and schedule range estimates. Typically the design is described in a Conceptual Design Report (CDR) and cost and schedule are supported by a resource loaded schedule and a collection of supporting information called "Basis of Estimate" (BOE) documents.
- A funding profile (time phased funding plan) that is compatible with the project's expected spending over time.
- Management plans including an Acquisition Strategy, Preliminary Project Execution Plan, Preliminary Hazard Analysis Report, Quality Assurance, Risk Management Plan, and a Risk Assessment.
- National Environmental Policy Act (NEPA) strategy and determination, i.e. whether a formal environmental assessment or impact statement is appropriate.

What impacts does CD-1 approval have on a project?

CD-1 allows for release of Project Engineering and Design (PED) funds, if available, for large projects and may allow for long lead procurements if specifically approved. Projects begin the next phases of design (preliminary design and perhaps final design for some elements) and development of a detailed resource loaded schedule. R&D and prototyping continue.

What is the relationship of the draft EIS to an anticipated CD-1 decision?

We shall see when and if a CD-1 decision is made but even if such a decision is made, we fully recognized that the project can be terminated at any time due to congressional action or a policy change regarding nuclear weapons and a new nuclear arms race.

1. No action is the best action

SRS Watch supports a "No-Action Alternative" that does not support locating a pit plant at SRS in the Mixed Oxide Fuel Facility (MFFF) and that alternative must not be linked to construction of a new pit facilities at the Los Alamos National Laboratory in New Mexico.

6/3-f.1

We believe that the stated No-Action Alternative is misstated in the draft EIS: "Under the No-Action Alternative, the existing MFFF would remain unused and NNSA would utilize the capabilities at LANL to meet the Nation's long-term needs for pit manufacturing. DOE has

evaluated the impacts of the pit production capacity at LANL in the 2019 SPEIS SA (NNSA 2019a) and the 2020 LANL SA (NNSA 2020)."

Thus, the correct No-Action Alternative in the draft EIS should be that the existing MFFF would remain unused and no pit plant would be located at SRS. That's the No-Action Alternative supported by SRS Watch. The No-Action Alternative should not be linked to pit production at the Los Alamos National Lab. 6/3-f.1 (Cont'd)

As the stated schedule is to produce 50 or more pits per year in the Plutonium Bomb Plant (PBP) by 2030, please explain what happens when that schedule is not met, a most likely outcome given that SRS has no pit production experience and support for the PBP is weak. 7/4-m

Additionally, state clearly the expected life-time of the SRS pit facility, if its life could be extended beyond that time and at what point the facility will be decommissioned. 8/6-p.8

2. Programmatic Environmental Impact Statement (PEIS) is needed and legally mandated; see attached documents, already filed with DOE/NNSA, on the legal need to prepare a PEIS.

In 2008, the *Complex Transformation Supplemental Programmatic Environmental Impact Statement* (Complex Transformation SPEIS) was prepared. Since that time much has changed at Los Alamos and DOE complex-wide that mandates preparation of a new PEIS.

The proposal by NNSA to greatly expand plutonium pit production is a system-wide, programmatic proposal that can only be adequately analyzed in a PEIS. Significantly changed circumstances at LANL and across the DOE complex dictate preparation of a new PEIS and associated public meetings and a public comment period before any site-specific documents are prepared. The draft EIS in question is being prepared out of order and must not be finalized until the PEIS process has concluded. Likewise, issuance of a Record of Decision (ROD) based on any final EIS will be legally and procedurally out of order. 4/4-f (Cont'd)

NNSA has made a preliminary decision to pursue pit production at two sites, a matter that has not been adequately analyzed from a complex-wide perspective. A host of things have significantly changed since the last PEIS and must be taken into account in the new PEIS. Indeed, there have been many significant changes at LANL and SRS and other DOE sites since 2008 relevant to current environmental concerns and policy decisions. Amongst others, the points below must be taken into account in a new PEIS and in the EIS, if such goes forward.

- Closure of the PF-4 plutonium operations at Los Alamos from 2013-2016, a shocking development which was not earlier foreseen. Significant questions linger if plutonium operations and existing pit production at LANL can ever be renewed and carried out safely.

- Failure of the so-called "Plutonium Center of Excellence" (Los Alamos) to produce up to 20 pits per year as required. The failure of LANL to meet claimed national

security needs can't be overlooked. Just how many pits are being produced per year at LANL and if production goals are being met or not must be clarified.

- Failure to explain how a jump from the unmet goal of production of 20 pits per year to 80-125 pits per year is possible or needed.

- New seismic information by the USGS pertinent to LANL and SRS must be taken into account, including in a new NNSA seismic analysis at LANL and SRS.

- The expanding role of Pantex in pit storage, and possibly in reuse of pits and production of plutonium oxide for pits. The PEIS must examine the role of the Special Nuclear Material Component Requalification Facility at Pantex.

- Possible and previously unrevealed plans for refurbishment of pits at any DOE site, especially Los Alamos and Sandia and Pantex, for reuse in warheads. (To be covered in the supplement requested by SRS Watch to the LANL draft SA or in the mandated PEIS.)

- Plans for production of purified plutonium at DOE sites for pits, including LANL, SRS, Pantex and perhaps other sites. Production of purified plutonium for pits overlaps with production of purified plutonium for plutonium disposal (via dilute & dispose) at SRS and for the proposed Versatile Test Reactor (VTR). What would happen to plutonium taken to LANL or SRS for pit production if pit production were halted? Would the plutonium be taken to other DOE sites?

- The role of Lawrence Livermore Livermore National Lab (LLNL) and LANL in design of new and refurbished nuclear warheads, for which NNSA claims there is a need, has changed.

- The role of the National Nuclear Security Site (NNSS) in Nevada in the pit production process, primarily via waste disposal, has emerged.

- In detail, what is the role of Y-12 at Oak Ridge, TN in pit production? See penultimate bullet below.

- Status and justification of pursuit of any new nuclear warheads, including the W87-1-like and W93, not planned for a decade ago.

- Apparent plans to "refurbish" all nuclear weapons in the stockpile with new pits, not anticipated when LANL was designated as the site to produce 20 pits per year.

- Failure to reveal plans to replace all the pits in all new and older warheads in the stockpile, a planning basis that has not heretofore been the planning basis. Does

4/4-f
(Cont'd)

NNSA aim to maintain ~4000 new and refurbished active and reserve weapons in spite of disarmament requirements of the New START treaty and the Nuclear Non-Proliferation Treaty (NPT)? Or not?

- Plans for new-design weapons and replacement of all pits in all weapons, reveals that the concept of "deterrence" has evidently been abandoned and the policy is based on fighting a nuclear war, which has not been analyzed from an overarching perspective. NEPA documents - both the draft EIS and PEIS - must discuss this.

- Accidents at the Waste Isolation Pilot Plant (WIPP) in 2014, which resulted in site closure, has impacted placement of TRU waste. Impacts to pit production of the 2014 events and possibly similarly debilitating accidents in the future at WIPP must be analyzed.

- TRU waste shipped from LANL to WIPP, which resulted in explosion of a waste cask resulting in WIPP contamination. There remain unresolved questions about instability of some TRU containers at LANL or stored at other sites. What happens if new pit production is halted and TRU has no place to go if WIPP is closed?

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(Cont'd)

- Capacity of WIPP is under growing pressure, in part due to existing TRU waste awaiting disposal, TRU waste from pit production and disposal of surplus plutonium. Plans to dispose of 48 MT of surplus plutonium in WIPP must be reviewed as far as it impacts competition from TRU volume generated from pit production. The demands on WIPP have changed dramatically since 2008.

- Changes in population since 2008 near DOE sites that may have a role in pit production or support activities.

- Cost of pit production by dollar amounts sought by a host of DOE sites, as revealed in the DOE budget request for Fiscal Year 2021. The role of each site named as having a role in pit production must be analyzed in the PEIS. (See details below.)

- Any new lessons learned from the history of pit production at the contaminated Rocky Flats site in Colorado must be reviewed, including information from former employees who may currently be advising development of new pit production.

- What is the role of DOE's Kansas City National Security Campus (KCNSC) in providing non-nuclear components for pit production? The Kansas City Plant is one of the involved sites in pit production and warhead production at the Y-12 plant. Footnote 3 on page 3 of the draft SA gives a nod to the KCP but there is no further information about it in the document. Note the footnote refers to the KCP and other DOE sites involved in pit production: "Refers to the NNSA Nuclear Complex that support plutonium pit production: SRS, Pantex, Kansas City National

Security Campus (KCNSC), Los Alamos National Laboratory (LANL), Nevada National Security Site (NNSS), Y-12 Plant, Sandia National Laboratories, and Lawrence Livermore National Laboratory (LLNL)." More extensive review of the roles of all these sites in pit production is needed, initially in the PEIS and then the EIS on the proposed SRS Plutonium Bomb Plant, if the project somehow endures.

- Impacts of the coronavirus (or other future epidemic or pandemic), which was not anticipated until recently. DOE sites have been greatly impacted by COVID-19, with DOE workers becoming ill and some sites have gone to "mission critical operations." The public must be allowed to comment in a PEIS and draft EIS on the assessed impact of the current pandemic or future epidemics or pandemics to proposed pit production.

The above are but examples of substantial changes from actions analyzed previously. These points document that there are significant new circumstances or information relevant to environmental concern and that a new PEIS is fully and legally warranted.

The expansion of plutonium pit production at LANL and the repurposing of an existing, partially constructed facility for pit production at SRS are clearly "connected," "cumulative," and "similar" actions. Therefore, "their environmental effects must be considered in a single impact statement," and a new PEIS is the legally and practically appropriate way to accomplish this. Both the proposed actions at LANL and SRS are "systematic and connected agency decisions" undertaken to implement the specific "executive directive" in Trump's 2018 *Nuclear Posture Review* to produce at least 80 plutonium pits per year by 2030. Accordingly, DOE's own NEPA regulations mandate the preparation of a nation-wide programmatic environmental impact statement with which the department must fully comply.

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(Cont'd)

When determining whether or not to prepare a PEIS, guidance must be sought in both DOE NEPA regulations and directives such as from the Council on Environmental Quality. The CEQ memo entitled *Effective Use of Programmatic NEPA Reviews*, December 2014, lays out when a PEIS will be prepared. It states that the PEIS must be undertaken from the start of a proposal and for the public to be allowed to provide comments on the programmatic proposal, which is not the case now before us. Sticking with the assessment in a PEIS process of over a decade ago, before many changes now before us (and mentioned above), does not constitute proper application of NEPA. The CEQ memo states:

> Programmatic NEPA reviews address the general environmental issues relating to broad decisions, such as those establishing policies, plans, programs, or suite of projects, and can effectively frame the scope of subsequent site- and project-specific Federal actions. A well-crafted programmatic NEPA review provides the basis for decisions to approve such broad or high-level decisions such as identifying geographically bounded areas within which future proposed activities can be taken or identifying broad mitigation and conservation measures that can be applied to subsequent tiered reviews....The purpose and need for a PEA or a PEIS should be written to avoid eliminating reasonable

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> alternatives and focused enough for the agency to conduct a rational analysis of the impacts and allow for the public to provide meaningful comment on the programmatic proposal....The planning process for the proposed action and the development of a programmatic NEPA review should start as early as practicable. By starting the planning process early, there should be sufficient time for establishing the reasonable scope of actions, alternatives, and impacts in the programmatic review, and identifying the decisions the programmatic review will support so that the level of analysis is clear from the start.

NNSA itself has revealed in the Fiscal Year 2021 budget request to Congress that a host of sites and offices are to be engaged in pit production. This is new and significant information. A PEIS involving review of the roles of each of these entities must be prepared, which would yield new information about the role of each site. See the following list compiled from the FY21 budget request:

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(Cont'd)

NNSA requested FY 2021 funding for expanded plutonium pit production by site

Kansas City Plant	$37,993,000
Los Alamos National Laboratory	884,599,000
Lawrence Livermore National Laboratory	62,361,000
NNSA Albuquerque Office	364,000
Nevada National Security Site	14,500,000
Pantex Plant	30,409,000
Sandia National Laboratories	66,700,000
Savannah River Site	441,896,000
DOE Wash Headquarters	42,962,000
Y-12 Plant	0 ($370,860,000 for Secondary Capability Modernization)
Total	**$1,581,784,000**

Source: DOE FY 2021 "Laboratory Tables" at https://www.energy.gov/cfo/downloads/fy-2021-budget-justification

Given that DOE is planning a fabrication capacity of 80 or more pits per year, a court order in *Natural Res. Def. Council v. Pena*, 20 F. Supp. 2d 45 (D.D.C. 1998) stated that if pit fabrication at LANL were planned to exceed 50 pits per year that preparation of a PEIS was required.

Obviously, DOE is on shaky legal ground by pushing ahead with plans for greatly expanded pit production without following the proper steps under NEPA, which means first preparing the PEIS. Preparation of the PEIS could be the result of a NNSA decision on the mater - a reversal of its current position but the most efficient way to move forward - result of a court ruling or by congressional directive. Likewise, the matter could be ruled moot if Congress changes the present approach to pit production, which could happen in the current session or in the future.

4/4-f
(Cont'd)

And, as things discussed in the draft EIS now before us and in the NNSA's *Draft Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory for Plutonium Operations,* DOE/EIS-0380-SA-06 have overlaps and commonalities, they must be discussed in the same NEPA document. As there are major discrepancies between the documents that must be reconciled - for example, failure to discuss in the draft SA the issue of pit reuse and issue of purified plutonium production. This exposes a major flaw resulting from the preparing two separate and inadequate NEPA site-specific documents for the two sites and not initially preparing the overarching PEIS.

The SRS pit documents must fully explain why the two key issues mentioned above - pit reuse and production of purified plutonium - were not discussed in the draft SA. SRS Watch has requested of NNSA an amended draft SA including the pit reuse and supply of purified plutonium issues and that it be open for public comment. We have not heard back from NNSA in response to our request. When will we receive a response?

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3/6-p.3
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In parallel, on April 30 the National Academies of Sciences, Engineering, and Medicine's Surplus Plutonium Panel on April 30, 2020 released its report entitled *Review of the Department of Energy's Plans for Disposal of Surplus Plutonium in the Waste Isolation Pilot Plant.* Amongst its recommendations, the report called for a PEIS on surplus plutonium disposition:

> RECOMMENDATION 5-5: The Department of Energy should implement a new comprehensive programmatic environmental impact statement (PEIS) to consider fully the environmental impacts of the total diluted surplus plutonium transuranic (DSP-TRU) waste inventory (up to an additional 48.2 MT) targeted for dilution at the Savannah River Site and disposal at the Waste Isolation Pilot Plant (WIPP). Given the scale and character of the diluted surplus plutonium inventory, the effect it has on redefining the character of the WIPP, the involvement of several facilities at several sites to prepare the plutonium for dilution, a schedule of decades requiring sustained support, and the environmental and programmatic significance of the changes therein, a PEIS for the whole of surplus plutonium that considers all affected sites as a system is appropriate to address the intent and direction of the

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National Environmental Policy Act and would better support the need for public acceptance and stakeholder engagement by affording all the opportunity to contemplate the full picture.

The full NAS report is posted here: https://www.nap.edu/catalog/25593/review-of-the-department-of-energys-plans-for-disposal-of-surplus-plutonium-in-the-waste-isolation-pilot-plant.

The report underscores the volume capacity problem at WIPP and that no single TRU waste stream destined for WIPP, such as from pits, can be viewed in isolation: "Emplacing the full amount of DSP-TRU waste in WIPP will test its physical and statutory capacity. WIPP is the nation's only operational deep geologic repository for nuclear waste, and the report says capacity at WIPP should be treated as a valuable and limited resource by DOE. The NNSA administrator, in consultation with the DOE assistant secretary for environmental management, should reserve capacity in WIPP for the full amount of DSP-TRU waste."

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(Cont'd)

Please discuss the relationship between the required PEIS on pit production with any PEIS that might be prepared on surplus plutonium disposition and TRU waste to WIPP.

3. **Please provide the legal basis for the pursuit of dual pit fabrication facilities, including fabrication of 50 pits or more per year at the Savannah River Site.**

National Defense Authorization Acts (NDAAs) back to about 2014 contain language pertaining to expansion of pit production. Passed in 2014, the "CARL LEVIN AND HOWARD P. BUCK" MCKEON NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 2015" contains a "Sense of Congress" on pit production (https://www.congress.gov/113/plaws/publ291/PLAW-113publ291.pdf) but two sites are not designated:

SEC. 3112. PLUTONIUM PIT PRODUCTION CAPACITY.
(a) SENSE OF CONGRESS.—It is the sense of Congress that—
(1) the requirement to create a modern, responsive nuclear infrastructure that includes the capability and capacity to produce, at minimum, 50 to 80 pits per year, is a national security priority;
(2) delaying creation of a modern, responsive nuclear infrastructure until the 2030s is an unacceptable risk to the nuclear deterrent and the national security of the United States; and
(3) timelines for creating certain capacities for production of plutonium pits and other nuclear weapons components must be driven by the requirement to hedge against technical and geopolitical risk and not solely by the needs of life extension programs.
(b) PIT PRODUCTION.—
(1) IN GENERAL.—Subtitle A of title XLII of the Atomic

9/1-d

> Energy Defense Act (50 U.S.C. 2521 et seq.) is amended by
> adding at the end the following new section:
> **"SEC. 4219. PLUTONIUM PIT PRODUCTION CAPACITY.**

In the NDAA for FY 2020 (https://www.govinfo.gov/content/pkg/BILLS-116s1790enr/pdf/BILLS-116s1790enr.pdf), two sites are also not mentioned:

> **SEC. 3116. MODIFICATION TO CERTAIN REQUIREMENTS RELATING TO PLUTONIUM PIT PRODUCTION CAPACITY.**
> (a) SENSE OF CONGRESS.—It is the sense of Congress that—
> (1) rebuilding a robust plutonium pit production infrastructure with a capacity of up to 80 pits per year is critical to maintaining the viability of the nuclear weapons stockpile;
> (2) that effort will require cooperation from experts across the nuclear security enterprise; and
> S. 1790—755
> (3) any further delay to achieving a plutonium sustainment capability to support the planned stockpile life extension programs will result in an unacceptable capability gap to our deterrent posture.
> (b) MODIFICATION TO REQUIREMENTS.—Section 4219 of the Atomic Energy Defense Act (50 U.S.C. 2538a) is amended—
> (1) in subsection (a), by striking paragraph (5) and inserting the following:
> "(5) during 2030, produces not less than 80 war reserve plutonium pits.";
> (2) by striking subsection (b);
> (3) by redesignating subsections (c) and (d) as subsections (b) and (c), respectively;
> (4) in subsection (b), as redesignated by paragraph (2), by striking "2027 (or, if the authority under subsection (b) is exercised, 2029)" and inserting "2030"; and
> (5) in subsection (c), as redesignated by paragraph (2), by striking "subsection (c)" and inserting "subsection (b)".

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The summary of the draft EIS states on page S-1 that federal law is guiding pursuit of 80 pits per year: "Since 2014, Federal law has required the Secretary of Energy to produce no less than 30 war reserve plutonium pits beginning during 2026 and thereafter demonstrate the capability to produce war reserve plutonium pits at a rate sufficient to produce 80 pits per year (Volume 50 of the *United States Code*, Section 2538a [50 U.S.C. § 2538a], as amended by the National Defense Authorization Act for Fiscal Year 2020." But two pit sites are not mentioned.

To state it clearly: a SRS pit plant is not mentioned in the cited NDAAs.

Thus, where in law are two pit-production sites stipulated or required?

The report to the FY 2018 Senate Energy and Water Development Appropriations bill stated:

> The Committee continues to support the Nuclear Weapons Council's program of record for plutonium pit production to meet the Fiscal Year 2015 National Defense Authorization Act requirement of 30 pits per year at Los Alamos National Laboratory by 2026. Within available funds, NNSA is directed to contract with a third-party federally-Funded Research and Development Corporation to conduct an independent assessment of the NNSA's decision to conduct pit production operations at two sites. NNSA shall identify and execute a contract with an independent FFRDC, not directly involved in plutonium pit production, not later than 60 days after enactment of this a act. NNSA shall not proceed with conceptual design activities for the recently announced preferred alternative until an FFRDC is under contract. The assessment shall include an analysis of the four options evaluated in the recent Plutonium Pit Production Engineering Assessment, all identified risks, engineering requirements, workforce development requirements, and other factors considered. The FFRDC shall submit its report to the Committees on Appropriations of both the Houses of Congress not later than 210 days after enactment of this act.

Please discuss the results of the stipulated report, especially regarding "the NNSA's decision to conduct pit production operations at two sites" and enter the report into the NEPA record.

9/1-d
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Additionally, the *Draft Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory for Plutonium Operations,* DOE/EIS-0380-SA-06 states "At a programmatic level, NNSA could adopt a Modified Distributed Centers of Excellence Alternative for plutonium operations from the Complex Transformation SPEIS." (page iii) The word "could" says it all. There is no requirement for two sites despite claims that two pit-production sites are needed. Two sites are being pursued primarily to get taxpayer money to SRS contractors due to the termination of the bungled and mismanaged plutonium fuel (MOX) project, correct?

NNSA admits that shifting to a dual-pronged approach will be costly:

> Using two pit production sites would improve the resiliency, flexibility, and redundancy of the Nuclear Security Enterprise by not relying on a single production site and is considered the best way to manage the cost, schedule, and risk of such a vital undertaking (DoD 2018b). According to NNSA testimony, "Even though this approach will require NNSA to fund activities at two sites, any interruption or delay to pit production in the future due to the lack of resiliency will have huge cost increases across the entire Nuclear Security Enterprise" (DOE 2019). A two-site pit

production strategy, in which each site would have the capability to produce up to 80 pits per year, would enable NNSA to meet national security requirements if one facility became unavailable." (S.1.2.4 Dual Pit Production Sites)

The Exchange Monitor on March 11, 2020 stated: "As part of a requested, and controversial, $20 billion 2021 budget request, the NNSA seeks more than $835 million to upgrade PF-4, more than double-and-a-half the 2020 appropriations of just under $310 million. For the Savannah River Plutonium Processing Facility, the NNSA seeks just over $440 million for 2021, or about 8% more than the 2020 appropriation. The agency expects the entire split-state pit complex to cost around $30 billion to build and operate over several decades." Are these cost increases sustainable in future budgets, especially given the huge debt taken on due to the virus crisis?

NNSA itself has brought the cost issue into the NEPA process and states in the draft EIS on the SRS Plutonium Bomb Plant: "NNSA considered the alternative of building a new Greenfield pit production facility at SRS. The mean acquisition cost of such a new facility was determined to be approximately $1.8 billion more than the cost of repurposing the MFFF (NNSA 2017, Figure 6-2)." (page S-17) In addition, life-cycle costs of the SRS pit project must be discussed.

So, where is a detailed, updated cost analysis of the SRS pit plant, with per year spending needs into the future? NNSA has said a new cost analysis would be out around the time of a CD-1 decision but that analysis is needed before any NEPA document on the SRS pit plant is finalized. Please provide the new cost reports(s). Per DOE practice, cost estimates will climb, correct?

The DOE budget request for Fiscal Year 2021 reveals that the pit facility at SRS could cost almost $5 billion by 2030. But pursuit of a rushed, two-pronged approach, especially at a site that has failed in its pit-production mission - Los Alamos - and a site that has zero pit-production experience – SRS - could magnify risks of two production sites while downplaying pit renovation at Pantex and could hold more risk that having a single functioning site. 10/6-h.3

Please explain how maximizing costs on a fast-track schedule utilizing two sites, one a poorly functioning site and the other a site with no pit experience would "improve the resiliency, flexibility, and redundancy of the Nuclear Security Enterprise" and be the best way to manage costs and risks. The exaggerated claims have been made but have not been substantiated.

Isn't there a real risk of dual-point failure with two rushed facilities that may lack both financial and political support and that will stretch NNSA to the limits?

Thus, if cost is a factor NNSA will not choose the most costly option: two pit-production sites. But, sadly, as we have seen with other complicated and costly projects, isn't the goal here to maximize costs in order to transfer more tax payer money to contractors?

4. The Nuclear Posture Review of February 2018, used for a basis to expand pit production, is not law and does not designate two pit-production sites.

The NPR states that the US will:

> Provide the enduring capability and capacity to produce plutonium pits at a rate of no fewer than 80 pits per year by 2030. A delay in this would result in the need for a higher rate of pit production at higher cost.

11/2-e
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The introduction to the NPR, called the "Secretary's Preface," states that "This NPR reflects the current, pragmatic assessment of the threats we face and the uncertainties regarding the future security environment."

The NPR, which is only a policy document, does not attempt to dictate two pit-production sites.

DOE and the Department of Defense DOD issued a news release on May 10, 2018 stating two pit-production sites would be pursued with "a minimum of 50 pits per year produced at SRS and a minimum of 30 pits per year produced at LANL." This is not law.

Please clarify that the two-pronged pit production approach is policy or opinion and not law, that the NPR is not law and that the DOE-DOD statement mentioned above is not law.

5. In the summary of the draft EIS it is stated that "Today, the United States' capability to produce plutonium pits is limited." (page S-1) Why is this?

As a decision was made to produce 20 pits per year at Los Alamos National Laboratory to meet the need for pits, how is the production "limited" when this level was determined to be adequate after the contaminated Rocky Flats site was raided and ceased production in 1989?

Has the PF-4 facility LANL been able to meet its 20 ppy production goal? If not, why not?

12/3-c

Why was the PF-4 facility closed from 2013-2016 and is it now back at full operation or not?

Given inability to meet the 20 ppy goal, hasn't this failure resulted in a "self-limited" situation? How has the failure to produce 20 pits per year put pressure on plans for new pit production?

Why isn't the 20 ppy target for LANL not being proven before expansion of pit production at both LANL and SRS? Is expansion of pit production when even a "limited" production goal can't be met a prudent approach? Is it a risky approach?

Why isn't the 20 ppy goal being demonstrated before pit-production is being expanded, especially to a site with absolutely no pit production experience and little plutonium-handling experience in the past three decades? Shouldn't the 20 ppy goal be demonstrated first?

6. Section S.1.2.1 discusses plutonium pit aging. Please explain the status of new aging reports by NNSA and the JASON group of experts and provide them for the record.

The draft EIS states on page S-3:

> Considerable research has been dedicated to understanding how long plutonium pits will remain effective. Results thus far show that uncertainty in the performance of older plutonium increases over time resulting in decreasing confidence over time. At some age, the properties will change sufficiently to warrant replacement. NNSA continues to research the life expectancy of plutonium pits. This is scientifically challenging and will require many years to fully understand.

Please explain and provide documents about the "considerable research" that is mentioned.

In 2007, the JASON group of experts produced a report entitled *Pit Lifetime* that concluded: "Most primary types have credible minimum lifetimes in excess of 100 years as regards aging of plutonium; those with assessed minimum lifetimes of 100 years or less have clear mitigation paths that are proposed and/or being implemented."

Based on the mentioned "considerable research," does NNSA agree with that statement? If not, provide documentation.

The *Pit Lifetime* report went on to say that "JASON identified additional work that should be carried out over the next year or longer to gain a better understanding of relevant plutonium properties and aging phenomena that could affect weapons performance on timescales of a century and beyond." Just what "additional work" on plutonium-aging is now being done, by JASON, NNSA or any other entity? 13/1-c

The report to the FY 2018 Senate Energy and Water Development Appropriations bill stated:

> *Science*.—The Committee directs the Administrator to enter into a contract with the group known as JASON for a study to assess the efforts of the NNSA to understand plutonium aging and the lifetime of plutonium pits in nuclear weapons. The Administrator shall make available all information that is necessary to successfully complete a meaningful study on a timely basis. Not later than 18 months after the date of enactment of this act, the Administrator shall submit to Congress a report on the findings of the study. The report shall include recommendations of the stud for improving the knowledge, understanding, and application of the fundamental and applied sciences related to the study of plutonium aging and pit lifetimes, an estimate of minimum and likely lifetimes for pits in current warheads, and the feasibility of reusing pits in modified nuclear weapons. The report shall be submitted in unclassified form but may include a classified annex.

Was the stipulated study conducted and delivered to Congress? If not, why not? What did it say about pit aging and the feasibility of reusing pits in modified nuclear weapons? Have the results of it been included in the draft EIS? If not, why not? Please provide the mentioned report to the public and for the NEPA record.

A November 23, 2019 "Letter Report" by JASON to the NNSA stated that "in general, studies on Pu aging and its impacts on the performance of nuclear-weapon primaries have not been sufficiently prioritized over the past decade. A focused program of experiments, theory, and simulations is required to determine the timescales over which Pu aging may lead to an unacceptable degradation of primary performance."

The Letter Report implies less than full cooperation from NNSA: "The labs briefly presented their program to address Pu aging to JASON. The plan seemed sensible, but a detailed JASON assessment would require additional information about the program as well as technical details" And, it went on to say: "For future work, JASON recommends that LLNL and LANL continue to pursue a sustained program to improve their understanding of Pu aging on pits."

The Letter Report also states that "A Defense Programs Advisory Committee (DPAC) report completed in 2018 also revisited Pu-aging issues." Please discuss the findings of that report and provide it to the public and for the NEPA record.

In an April 6, 2020 letter from NNSA to Congress, NNSA confirmed it has not followed through with the report required in the Senate Energy and Water Development (SEWD) Committee report (S.R. 115-258) accompanying the *Energy and Water Development Appropriations Bill, 2019: "*The provision directed the Department of Energy's National Nuclear Security Administration (DOE/NNSA) to enter into a contract with the JASON Defense Advisory Group to assess NNSA's efforts to understand plutonium aging." That report has not been forthcoming has it? Why not? When it becomes available please provide it to the public and for the NEPA record. 13/1-c

In the letter, NNSA agrees that a JASON review is needed to "Assess the need for the full study, and if deemed necessary and timely, perform a more detailed, multi-year JASON study." And, NNSA concedes that "NNSA recognizes that there is continued uncertainty in assessing performance of older pits due to radioactive decay of the plutonium, and is committed to a variety of risk mitigation options, including placing higher priority on studies of plutonium aging and its effect on performance."

Thus, a full discussion of the status of new pit aging studies and what is contained in them must be included in any NEPA documents.

Why there is a rush to expand pit production without data on pit aging and pit refurbishment must be explained.

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The only prudent thing to do is to put new pit production on hold until essential new data on pit aging and pit reuse is forthcoming. If NNSA disagrees with that approach, please explain why not, both the public, for the NEPA record and to Congress.

7. Pit reuse and refurbishment must be analyzed in detail before new facilities sought

On page S-4 it is stated:

> For the foreseeable future, NNSA will rely on a combination of newly manufactured pits and judicious reuse of existing pits to modernize the U.S. nuclear stockpile. This approach enables NNSA to implement a moderately sized pit manufacturing capability of not less than 80 pits per year beginning during 2030. This capability allows for:
> • Enhanced warhead safety and security to meet DoD and NNSA requirements;
> • Deliberate, methodical replacement of older existing plutonium pits with newly manufactured pits as risk mitigation against plutonium aging; and
> • Response to changes in deterrent requirements driven by renewed great power competition.

On page S-18, NNSA summarily eliminates pit reuse for all new and refurbished weapons: "NNSA currently stages plutonium pits at Pantex. Like the pits in the active stockpile, those pits are aging and would not mitigate plutonium aging risks or enable NNSA to implement enhanced safety features to pits to meet NNSA and DoD requirements. Consequently, only reusing pits was eliminated from detailed analysis." 2/3-a (Cont'd)

The matter of pit reuse and pit refurbishment is short changed in the draft EIS and warrants detail discussion. What does "judicious reuse of existing pits" mean?

NNSA must clarify for which weapons there is the plan for "judicious reuse of existing pits."

Why was "only reusing pits" eliminated from analysis?

Can existing pits be upgraded and refurbished so as to allow reuse?

NNSA must explain exactly what "renewed great power competition" is and what "growing threats from peer competitors" is. Does countering so-called "peer competitors" with new weapons and dual-site pit production capability stimulate in advance a response from those so-called peers? Please explain why pursuit of arms reduction and arms control treaties with "peer competitors," such as keeping the New START Treaty in place, is not a safer and cheaper way to address the global threat from nuclear weapons

NNSA must discuss the role of DOE's Panted site near Amarillo, Texas in pit reuse, refurbishment and requalification and why "all pit reuse" is not possible, as claimed but unsubstantiated. This matter is best first addressed in the required PEIS.

The Special Nuclear Material Component Requalification Facility at Pantex is discussed in a 2015 posting by Pantex entitled *Day in the Life of a Pit* (https://pantex.energy.gov/news/blog/day-life-pit)

> Requalification allows a pit to stay in the stockpile; surveillance involves obtaining information on a pit, then sharing it with the national laboratories to help certify to the President that the nuclear weapons stockpile is at an extremely high level of quality...Our most important work involves the surveillance and reprocessing of nuclear material for nuclear weapons," David Cole, Weapons Operations director, said. "It has to be very high quality given the lack of underground testing. We can't build new, so we've got to take components that were not designed to remain in the stockpile this long and make them last longer...A second requalification process, to be designed in house, is expected to be installed at the end of fiscal 2016.

What is the status of the Special Nuclear Material Component Requalification Facility and the pit requalification or reuse or refurbishment program at Pantex? In the past, has that facility refurbished and requalified pits for reuse? Is it being used for that role now? Will it be used in the future? If so, in what way? Can the pit-reuse role of Pantex of other sites be expanded?

A document cited in the draft EIS, *National Security and Nuclear Weapons in the 21st Century*, states on page 21 that "depending on warhead type, the best estimate of minimum pit life is 85-100 years," It does not appear that this is based on information from the 2007 JASON report (as the time frame doesn't match), or is it? It is unknown what data supports the 85-year figure statement. In any event, it means that even according to this *National Security and Nuclear Weapons in the 21st Century* assessment that pits manufactured at the contaminated Rocky Flats Plant in the 1980s still have decades of life left. Please discuss.

2/3-a (Cont'd)

Please discuss new-design weapons such as the W87-1 and W93 and the "need" for new or reused pits for them.

Please discuss refurbishment of existing weapons and the "need" for new pits or if reused pits can be used. In the draft EIS, no case was made that pits can't be reused in refurbished weapons or that pit reuse can be adopted for newly deployed warheads. Please make the case.

Please discuss if pit safety and reliability can be enhanced via refurbishment and requalification, or not. Please discuss if pit reuse and refurbishment research is taking place=.

Why isn't there coordination between the draft EIS on the Plutonium Bomb Plant and the draft Supplemental Analysis on Los Alamos pit production concerning pit reuse issues? Pit reuse is not even mentioned in the draft SA, a serious and grave oversight that needs to be remediated via an amended NEPA document, along with an associated public hearing and public comment period, as requested by SRS Watch. (We have had no response from NNSA yet to our request, which I reiterate here.)

8. How many warheads will be kept? Does this comply with NPT?

Of highest importance, discuss what the plans are concerning replacing ALL pits in ALL new and active and reserve weapons. The NNSA plan appears to be to replace all pits in the stockpile - is this the case? From a security perspective, why is this necessary? What is the policy basis for this? Would replacement of all pits in all weapons thus mean that the stockpile of around 4000 weapons would be kept through this century? Isn't this actually a war-fighting force and not what's needed under any definition of "deterrence?"

An Aiken Standard article of February 15, 2020, assuming a 50 year lifetime of new pit facilities, confirms what the goal is - replacement of all pits:

> Want to know where 80 pits per year came from? It's math. Alright? It's really simple math," Peter Fanta, the deputy assistant secretary of defense for nuclear matters, said in December. "Divide 80 per year by the number of active warheads we have, last time it was unclassified it was just under 4,000, and you get a timeframe.

Please comment on Mr. Fanta's statement as it pertains to total production of pits at the SRS pit plant over its lifetime. Is the goal to produce at least a round 2500 pits at the SRS Plutonium Bomb Plant?

11/2-e (Cont'd)

How does keeping the number of weapons in the deployed and reserve stockpile comply with provisions of the Nuclear Non-Proliferation Treaty (NPT), which states: "Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control."

14/2-a
15/2-c

The NPT is clear - that the cessation to the nuclear arms race must be at an "early date" and that a disarmament treaty must be negotiated. Keeping 4000 nuclear weapons is in complete defiance of those legal requirements of the NPT and affirms that the alarming goal is a new nuclear arms race. Please respond.

On page S-17, the draft EIS confuses the policy of "deterrence" with the proposal before us - replacing pits in all new and refurbished nuclear weapons, for a stockpile of around 4000 active and deployed weapons: "Under the No-Action Alternative, NNSA would not proceed with the SRPPF, which might limit the ability to maintain, long-term, the nuclear deterrent that is a cornerstone of U.S. national security policy. Under the No-Action Alternative, the existing MFFF would remain unused and NNSA would utilize the capabilities at LANL to meet the Nation's long-term needs for pit manufacturing. DOE has evaluated the impacts of the pit production capacity at LANL in the 2019 SPEIS SA (NNSA 2019a) and the 2020 LANL SA (NNSA 2020)."

Please explain the definition of "nuclear deterrent" as used in the draft EIS and show where it came from. Please explain how replacing all pits in the existing stockpile constitutes

"deterrence." Deterrence in the arms control community is generally defined as something like a few hundred weapons or less.

Will keeping a large nuclear weapons stockpile, say around 4000 weapons, and pit-production capacity for that stockpile encourage or discourage global proliferation of nuclear materials and nuclear weapons technology, and a response from other countries?

Likewise, please discuss the risks to nuclear non-proliferation if the US were to withdraw from the New Start Treaty. Would more pits be "needed" if the US withdraws from the treaty?

11/2-e
14/2-a
15/2-c
(Cont'd)

9. Plutonium from old pits not reusable without purification; draft EIS mentions SRS purification options but does not choose an option and doesn't thoroughly analyze impacts of purification. MOX non-proliferation project becomes Dr. Jekyll proliferation project.

The draft EIS clarifies that plutonium from old pits would have to be purified before fabrication into new pits:

> In general, the pit-derived plutonium would not be suitable for new manufacturing—it would contain plutonium radioactive decay products (uranium, americium-241, and neptunium-237) and other undesirable characteristics. Therefore, the plutonium would be purified using pyrochemical (nonaqueous) recovery techniques, which would generate plutonium-bearing residues that must be recovered using aqueous techniques or disposed of as TRU waste. The proposed purification techniques are well known and have been successfully used at DOE sites for many years (NNSA 2019c). (pages 2-8, 2-9)

16/6-p.1

The document briefly states what type of plutonium purification could be deployed:

> Nonaqueous plutonium metal purification operations could include three primary processes: (1) direct oxide reduction, which uses calcium metal to reduce plutonium oxide to plutonium metal; (2) molten salt extraction, which uses chloride salts to remove americium-241 from the plutonium; and (3) electrorefining, which uses sodium, potassium, and calcium chloride salts to remove other key impurities from the plutonium metal (NNSA 2019c). In aqueous recovery, plutonium-bearing residues would be recovered using techniques in which nitric acid and hydrochloric acid are used to chemically dissolve feed material. Use of the aqueous process to recover plutonium would reduce the overall quantities of TRU wastes needing disposal at WIPP (NNSA 2019c). Pit production could continue without aqueous recovery; however, TRU waste generation would increase. (page 2-9)

Please clarify what "could" means in the above paragraph.

Please clarify exactly what type of purification technology will be deployed at SRS - aqueous or nonaqueous? Or a combination of both? And, give details of the technology for both. Describe

the equipment to do both methods and potential worker does and criticality risks. Where might this take place inside the pit plant, in relation to casting?

How is beryllium removed from stored pits and what happens to removed beryllium?

Will there be enough purified plutonium for pits, dilute & dispose (to WIPP) and the Versatile Test Reactor (VTR)? I've seen no explanation of where all that plutonium would come from for those real or speculative projects, which are intertwined concerning DOE's need for purified plutonium. Please explain.

To go into more detail, there are currently or might be intense demands for purified plutonium for various DOE projects involving plutonium and those demands are interrelated. The sources of the purified plutonium for these projects has not been fully explained or stipulated by DOE and must be explained. The largest known demands for purified plutonium, perhaps in the oxide form, are for these three NNSA/EM/NE projects:

16/6-p.1
(Cont'd)

- Pits - how purified plutonium will be obtained for all pit production must be specified;
- Plutonium disposition via "dilute & dispose" (or other method) in WIPP - 48 MT or more;
- Versatile Test Reactor (VTR) fuel - approx. 1500 kg/year of plutonium over many years for fuel for a single reactor.

While the ARIES technique at PF-4 at Los Alamos is being used at a very low level of plutonium oxide production, this material is slated is for dilute & dispose only. Currently, the production rate of oxide via ARIES is about 150 kg/year and 1 MT of oxide has been accumulated. DOE claims production will ramp up to 1500 kg/year, which will be a huge challenge based on past performance.

Might ARIES at LANL be used to provide any purified plutonium for pit production at LANL or SRS?

It is of great significance that a parallel and competing program for purified plutonium that the National Academies of Sciences' Committee on Disposal of Surplus Plutonium at the Waste Isolation Pilot Plant stated in its April 2020 report entitled *Review of the Department of Energy's Plans for Disposal of Surplus Plutonium in the Waste Isolation Pilot Plant* that a PEIS was needed concerning the matter of the downblending of surplus plutonium (via "dilute & dispose") for disposal in WIPP as waste. On page 9 it is stated:

5/4-e
(Cont'd)

> RECOMMENDATION 5-5: The Department of Energy should implement a new comprehensive programmatic environmental impact statement (PEIS) to consider fully the environmental impacts of the total diluted surplus plutonium transuranic (DSP-TRU) waste inventory (up to an additional 48.2 MT) targeted for dilution at the

> Savannah River Site and disposal at the Waste Isolation Pilot Plant (WIPP). Given the scale and character of the diluted surplus plutonium inventory, the effect it has on redefining the character of the WIPP, the involvement of several facilities at several sites to prepare the plutonium for dilution, a schedule of decades requiring sustained support, and the environmental and programmatic significance of the changes therein, a PEIS for the whole of surplus plutonium that considers all affected sites as a system is appropriate to address the intent and direction of the National Environmental Policy Act and would better support the need for public acceptance and stakeholder engagement by affording all the opportunity to contemplate the full picture.

This call by the NAS committee for a PEIS on plutonium downblending directly overlaps with the issue of the source purified plutonium for pits (and the VTR), for which there may well be competition with both technologies and such things as floor space in PF-4 or at SRS. The relationship of the plutonium-supply issue and any plutonium downblending PEIS and the draft EIS and a pit PEIS must be discussed.

The document is lacking a full explanation of the flow chart for amounts of plutonium coming in for pit production at SRS, and leaving as pits or waste. A full accounting of plutonium sources and amounts (and associated waste streams), such as this chart in the *Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement (SPD Supplemental EIS)* (DOE/EIS-0283-S2), April 2015, page S-9 (https://www.srs.gov/general/pubs/envbul/documents/EIS-0283-S2_SPD_Summary.pdf) is needed:

5/4-e
(Cont'd)

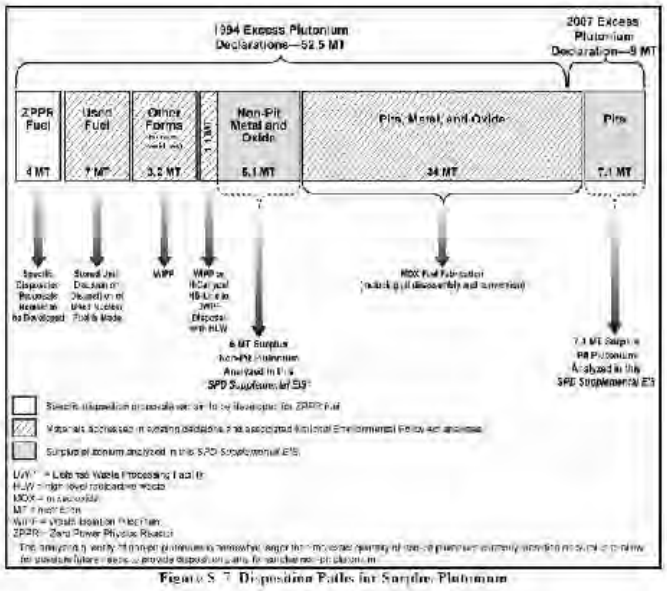

Figure S-7 Disposition Paths for Surplus Plutonium

SRS currently stores about 12 metric tons of plutonium in the old K-Reactor. Only about 6 MT of that have been designated for disposition, via dilute & dispose. It is unclear what will happen with the remaining material, which has been stranded at SRS due to the failure of the mismanaged MOX project. What will happen to plutonium not yet designated for disposition?

In a Federal Register notice of April 5, 2016, NNSA issued a Record of Decision (ROD) on "Surplus Plutonium Disposition" - https://www.govinfo.gov/content/pkg/FR-2016-04-05/pdf/2016-07738.pdf - on about 6 MT of plutonium stored at SRS: "DOE/NNSA is announcing a decision to implement its Preferred Alternative for the disposition of 6 MT of surplus non-pit plutonium, as described in DOE/NNSA's *Preferred Alternative for Certain Quantities of Plutonium Evaluated in the Final Surplus Plutonium Disposition Supplemental EIS*. Shipments of this surplus non-pit plutonium to WIPP, after it is operational, will be placed in the queue of waste to be shipped to WIPP. This plutonium will be prepared and packaged to meet the WIPP waste acceptance criteria for contact-handled TRU waste and other applicable regulatory requirements." This ROD is inexplicably not listed as a reference in this draft EIS and I hereby enter it into the record.

The decision to dispose of 6 MT of surplus plutonium is intricately linked to what happens to the rest of the plutonium stored by DOE, including plutonium bound for pits. Will a ROD be issued on the additional plutonium at SRS and not covered by a ROD? Will that plutonium be used for pits or planned to be disposed of in WIPP? Will any ROD that might be issued detail when all plutonium now at SRS will be removed?

5/4-e
(Cont'd)

Ironically, SRS had earlier been designated a plutonium disposition site with a project - MOX - that was loudly and continuously claimed to permanently dispose of plutonium and strengthen nuclear non-proliferation. It was clear from the start that these were overblown claims and as the project fell apart the non-proliferation claims by boosters evaporated. Subsequently, NNSA claimed in the ROD mentioned above that the D&D method would "reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner, ensuring that it can never again be readily used in nuclear weapons."

Now, NNSA has taken the exact opposite track from claimed nuclear non-proliferation goals with the MFFF and aims to turn SRS into a nuclear bomb plant that would stimulate nuclear proliferation and help set off nuclear arms race. Thus, the "MOX non-proliferation plant" is now being transformed into the SRS Nuclear Proliferation Plant (SNUPP). As this dramatic shift in NNSA's intended role of SRS appears schizophrenic please explain the reasons for it. Please provide documentation from psychologists, psychiatrists or mental health professionals if it helps explains this bizarre behavior. Is the underlying reason for proposing the SNUPP to fill the funding hole created by MOX, making it simply a parochial fiduciary decision void of moral considerations and supported by such self-serving politicians as Senator Lindsey Graham and Representative Joe Wilson, who are out to gouge the U.S. taxpayer for this unjustified project?

Can NNSA assure the public in a NEPA document that not a single gram of additional plutonium will be brought to the site until all plutonium has been removed from the K-Reactor and taken out of South Carolina, for disposition or storage elsewhere?

How much plutonium would come to SRS for pit production over the life of the project? How much plutonium bound for purification would be at SRS at any one time? Will the State of South Carolina be informed about incoming plutonium shipments any outgoing plutonium and waste shipments and on-site pit waste disposal? How long would pit production take place? 5/4-e (Cont'd)

It must be pointed out not only is there a lack of pit-production experience at SRS but also a woeful lack of plutonium handling experience. Production of plutonium in the on-site reactors was halted by the late 1980s. Thus, production of plutonium buttons shipped to Rocky Flats for pit production ended at that time. SRS is currently downblending (via dilute & dispose) a small amount of plutonium in a glovebox in the K-Area and this is with but a small team. Ramping that process up to larger output will be a challenge and require more congressional appropriations and still the team would not be large. A few 3013 plutonium storage cans undergo destructive examination every year, but that work may have been done by the D&D team. Plutonium oxide was produced in the HB-Line recent years with a very small crew but that project was halted after processing problems and mission reorientation. Likewise, some plutonium was dumped through the H-Canyon into the tank farm for eventual vitrification in the Defense Waste Processing Facility but that amount of material was on the order of 100 kg and that effort was halted in favor of sending surplus plutonium to WIPP. There may also be some research at Savannah River National Lab with a small amounts of plutonium or surrogate material. The largest interaction with plutonium by SRS staff is simply its storage in drums in K-Area. Only a sample of those drums and the inner 3013 can are opened for destructive examination. SRS does not even have the capability to properly repackage that plutonium in 3013 cans. Claims by boosters of pit production have been incorrect about the vast experience of SRS in handling plutonium. Such experience does not currently exist. Thus, the skills in handling, purifying and handling plutonium at SRS and casting it into pits are essentially a notch above point zero. And, if D&D continues and expands, those crew members can't be shifted to pits without harming D&D. So, SRS is left with a potential pit workforce with almost no plutonium-handling experience. Please explain how this daunting obstacle will be overcome. 17/6-h.2

10. Why more TRU created per pit at SRS vs LANL? Does WIPP capacity exist?

Based on analysis of the draft SA on Los Alamos pit production and the draft EIS on the SRS Plutonium Bomb Plant, it can be seen that NNSA asserts that there is significantly more TRU waste created per pit via production at SRS. The EIS must discuss the reasons for less TRU per pit produced at LANL vs SRS. 18/6-j.1

A pertinent document to plutonium processing at LANL was originally not publicly accessible, as it should have been. It was listed in the reference section of the draft EIS on the SRS Plutonium Bomb Plant and was requested and obtained by SRS Watch. It is unknown why the document was not made public at the time the draft EIS was published. It must be made public now. That

document, *Data Call Response Supporting the SRS Pit Production EIS* - dated February 2020 - states the reason for more TRU at SRS per pit produced can "primarily" be attributed to americium-241 removal from LANL plutonium. (See page 20 pdf in that document posted on the SRS Watch website on May 8, 2020 as a public service as we can't determine if NNSA has posted it: https://srswatch.org/wp-content/uploads/2020/05/SRNS-2020-Data-Call-Responses-002-rcvd-April-28-2020.pdf.)

The presented amount of TRU waste generated from operations of the SRPPF is a bounding value that assumes that aqueous recovery is not operating to recover plutonium. SRNS estimates that the implementation of aqueous recovery would result in a reduction of approximately 25 percent of the projected TRU waste volume. The primary reason that TRU waste generation rates are higher at SRPPF (on a per pit basis) than at LANL is that SRPPF sends Americium 241 to waste while LANL recovers Am-241 as a byproduct.

Is it accurate to state that americium-241 is removed from pit plutonium at LANL and not at SRS? How is this done? Is this part of the ARIES process (which is so far only designated for dilute & dispose and not for pits) or not? How much americium is removed? What is done with the americium? Would americium removal be applied to any plutonium purification for pit fabrication at SRS? (Please provide documentation of that.) If so, via what process would be used and where would it be located? Why is no americium removal planned for SRS? 18/6-j.1 (Cont'd)

I note that a 2011 Idaho National Lab document entitled *High Purity Americium-241 for Fuel Cycle R&D Program* refers to an Americium-241 shortage and says: "DOE-NE currently has need for high purity Am-241 metal and oxide to fabricate fuel pellets for reactor testing in the Fuel Cycle R&D program. All the available high purity americium has been gathered from within the DOE system of laboratories. However, this is only a fraction of the projected needs of FCRD over the next 10 years. Therefore, FCR&D has proposed extraction and purification concepts to extract Am-241 from a mixed AmO2-PuO2 feedstock stored at the Savannah River Site." Does this "shortage" still exist and will it impact Am-241 removal at SRS from pit plutonium?

Why would a site generating more TRU waste per pit, SRS, be chosen over one supposedly producing less (LANL)? Please explain.

The draft EIS states that a huge amount of TRU waste storage is planned, which could be vulnerable to drum degradation, accident and attack: "The storage facilities would be capable of staging approximately 5,000 to 6,000, 55-gallon drums of TRU waste within the PIDAS." [Perimeter Intrusion Detection and Assessment System] Why is such a large amount of storage planned? Is this in the event that WIPP can't receive it?

10/6-j.16

How would TRU wastes be packaged, stored and removed from the PBP site? How would storage be secured? Where would wastes be stored before shipment for disposal?

Would any pit waste be transferred to EM or be handled and/or disposed by EM, or by NNSA? How long would waste be stationed at other SRS non-pit facilities? Would NNSA pay for all

waste management operations and disposal or not? Would waste management costs, whether by NNSA or EM, be included in the yearly operational costs for the pit facility? 10/6-j.16 (Cont'd)

The draft EIS assumes WIPP capacity for pit TRU waste and states that "approximately 5,350 cubic meters of TRU waste could be generated over the life of the project (i.e., 50 years) at LANL, assuming a production rate of 30 pits per year. The available capacity of WIPP would accommodate the conservatively estimated TRU waste that could be generated over the next 50 years." So, the SRS pit plant life is 50 years and WIPP would be expected to operate at least until 2080? (Pit start date in 2030 + 50 years.)

There are many distinct amounts of TRU waste from different DOE projects at different sites all competing for the capped volume at WIPP. Please explain how all these TRU waste streams were taken into account for calculating disposal of TRU waste from SRS and LANL pit production. By itself, there may be volume in WIPP for the pit TRU waste but only when this is viewed as but one "bucket" of TRU waste. When all TRU waste streams are looked at in totality they will stress the capacity of WIPP. Please explain how all the waste stream from all DOE and NNSA projects and sites will be simultaneously accommodated per the volume cap in the Land Withdrawal Act. Pit TRU waste going to WIPP can't be analyzed alone. And, please discuss that production of fewer pits than the goal of 80 or more per year at LANL and/or SRS would result in less TRU waste and less demand on WIPP volume. 20/6-j.3

11. Casting vs wrought process?

The draft EIS on the SRS Plutonium Bomb Plant (PBP, also known as SNUPP) states that a wrought process is also being looked at for pit production (versus a cast process with plutonium liquid): "Wrought Production Process (Sensitivity Analysis #2). The wrought process is a potential manufacturing alternative to casting that could be used in the SRPPF. If implemented, some gloveboxes would be modified to support the wrought process to supplement, not replace, the casting process. In the wrought process, plutonium metal is annealed in a furnace and fed to a rolling mill to produce a flat sheet. Because the wrought process could be used in the SRPPF, this EIS includes a sensitivity analysis of that process. That sensitivity analysis, which is included in Chapter 4 of this EIS, identifies and characterizes any notable changes in the potential environmental impacts between the casting (see Chapter 2, Section 2.1.2.3 of the EIS) and wrought processes." (page S-15) 21/3-g

Why is the wrought process being reviewed at SRS in addition to a cast process? Does this imply weaknesses with the cast process or doubts about it? How will adding a second process impact project costs and staff training and operational staffing?

As SRS has zero pit fabrication experience, please outline risks related to an inexperienced work force using the cast or wrought process. Will risks of accident and worker exposure increase given an inexperienced work force, especially under schedule and budget pressures?

12. Investigations into possible fraud, waste, abuse and mismanagement at MOX debacle needed before pit production pursued by NNSA

Besides skipping over the legally mandated step of preparing a PEIS on pit production before site-specific NEPA documents are prepared, NNSA is also skipping over investigating what happened with the plutonium fuel (MOX) boondoggle at the Savannah River Site.

Given the waste of $8 billion in tax money on planning and construction of the failed MOX project, it will remain urgent and essential that investigations by NNSA, Congress and oversight agencies be conducted. Lacking accountability and "lessons learned" from the MOX debacle will all but guarantee that highly complex, costly projects such as plutonium pit production will also face management problems, cost overruns and significant schedule delays. Red flags for possible pit-production failure are already flying high.

To underscore that information about possible MOX fraud must be investigated, SRS Watch is aware of a former MOX project supervisor who has information about how suspect activities involving receipt and storage of MOX components and equipment. He has relayed information to the government but he has not been contacted to be interviewed. An investigator with the Government Accountability Office knows of this individual, who is willing to speak and give details, but GAO is inexplicably dragging its feet in speaking with him. SRS Watch will help facilitate his interaction with NNSA or the DOE's Inspector General's office or other investigative offices. I am awaiting a contact from NNSA: srswatch@gmail.com. As readers will realize, this offer is a test of NNSA's interest in investigating the MOX debacle before jumping into yet another costly, complicated project that already faces the risk of going belly up. 22/8-d

Given that NNSA is rushing into the misguided two-pronged pit project without taking proper and deliberate steps already echoes the disaster that the MOX project became. It is fully predictable that cost overruns and schedule delays are in the offing - as warned by the Institute for Defense Analysis - and that eventual failure to meet stated project goals may be the outcome. Hiding the MOX ogre in a dark closet is only harming NNSA's ability to pursue pit production.

The draft EIS must discuss the faults with NNSA's MOX project and how they will be addressed in the similarly large, costly and complex pit project. The EIS and PEIS must include documentation concerning any lessons that have been learned from the failed MOX project and discuss what construction problems and inspection irregularities existed at time of project termination in 2018, including mistakes in through-wall penetrations, wall placement, piping, hangers, cable trays and HVAC, inadequate inspector by contractors and how they will be corrected. Are some problems not correctable?

Will NNSA pledge that investigations into the MOX debacle will begin and be made public?

13. Nuclear Regulatory Commission has no role in pit production, so why even mention NRC?

The draft EIS states on page S-7: "The MFFF was designed to safety and security standards (including seismic performance category 3+ to meet U.S. Nuclear Regulatory Commission [NRC] requirements), with walls of reinforced concrete (NNSA 2017, p. A-29). The facility is being verified to meet all relevant DOE requirements for the pit production mission."

Why is the role of the NRC in the MOX debacle even mentioned? The NRC issued a permit for construction and no final inspections had taken place to assure the public that NRC construction requirements had been met. In fact, it appears that a final NRC inspection on all work and installations may not have been able to be passed given MOX construction problems. No license for MOX plant operation had been issued by the NRC.

Even without any knowledge if final NRC standards were met when the MOX construction was terminated, how is anything the NRC did now relevant to the pit plant? Does the NNSA intended to enlist the NRC to document the status of construction and if it complied with NRC regulations and NRC license conditions at the time the painful MOX travesty was terminated? Will the NRC be enlisted to describe all the construction problems that were faced and that remained at the time of MOX project termination? 23/6-p.9

A host of construction problems were left when the MOX plant construction was terminated. NNSA offers no assurances that those construction problems can be corrected in areas of the plant that would be used for pit production, plutonium storage and processing or other activities. Problems with HVAC installation, through-wall penetrations, pipe hangers, cable trays, faulty and old equipment (if reused from MOX debacle), wiring, walls in wrong place and faulty rebar were some of the problems reported by DOE and MOX workers. Some of these could impact the status of the "repurposing" of the MOX plant into a bomb plant. Please list construction problems that were left when MOX was terminated, how they will be validated, how they will addressed and corrected and how the status of them will be certified to meet relevant DOE standards.

14. A key NEPA document on pit production in the "Modern Pit Facility" is not mentioned in the draft EIS. Why not?

EIS-0236-S2 on the *Supplemental Programmatic Environmental Impact Statement on Stockpile Stewardship and Management for a Modern Pit Facility* was begin 2003 but quietly canceled in 2006. The document, on locating a single pit plant, was flawed in its assessment of the need and impacts of expanded pit production. 24/6-p.10

Why is the MPF NEPA document and its status, which affirms that a NEPA process to locate a pit plant can be terminated, not mentioned? What lessons does the failed pursuit of the MPF hold?

(I well remember a hearing around 2004 in N. Augusta, SC on the draft PEIS, in which I predicted in my testimony that the MPF would never be built as the document did not justify the pit mission or adequately examine its impacts. That prescient testimony should be made a part of this record.)

24/6-p.10 (Cont'd)

15. NNSA will look at 125 ppy for SRS pit plant, far beyond 50 pits per year – why?

The draft EIS states is section "S.2.1.4 Sensitivity Analyses":

> Because there could be variations in the Proposed Action, this EIS also includes three sensitivity analyses: (1) producing up to 125 pits per year; (2) producing pits using the wrought process; and (3) retaining the existing administration building. These are described below . Production of 125 Pits per Year (Sensitivity Analysis #1). If national security requirements ever demand, pit production capacity increases could be supported using multiple shifts and/or expansion into available space within the SRPPF. In order to produce up to 125 pits per year at SRS, this EIS analyzes expansion into available space with multiple-shift production. Although no additional facilities would be required to support production of up to 125 pits per year, additional equipment (e.g., pyrochemical furnaces, lathes, and heat treat equipment) would need to be installed in available space within the SRPPF. The higher value of 125 pits per year was chosen to be consistent with the value used in the previous analysis contained in the Complex Transformation SPEIS (available online: https://www.energy.gov/nepa/downloads/eis-0236-s4-final-supplemental-programmatic-environmental-impact-statement).

25/3-i

A footnote on page 2-10 states: "This EIS also includes a sensitivity analysis of producing up to 125 pits per year at SRS (see Section 2.1.5) to be consistent with the value used in the previous analysis in the Complex Transformation SPEIS (NNSA 2008a)."

So, why is this 125 ppy figure now chosen as it's clear that it's a relic of more than a decade ago? Why was this 125 ppy figure chosen if the currently claimed production goal is 50+ ppy at SRS and 80+ ppy overall (at SRS and LANL)? Why would a production rate of 125 ppy be needed? Does a 125 ppy rate imply more rapid rebuilding of the nuclear stockpile to pour more fuel on a new and dangerous nuclear arms race? Or the insanity of nuclear war?

On page 2-11, in "Table 2-2—Key Annual Operational Parameters and Wastes for the SRPPF Complex," waste amounts from production at 50 ppy, 80 ppy and 125 ppy are included. Does this imply that the 50 ppy stated goal could be superseded by the new and much higher goals of 80 ppy or 125 ppy? So, NNSA is actually planning for a production rate of 125 ppy, over double the 50 ppy capacity? Please clarify what the actual pit production per year goal is and if that will be abided by. How are costs impacted by 50 vs 80 vs 125 (or more?) pits produced per year?

16. Impact of new pit production for new-design weapons or refurbished weapons on the U.S. moratorium on nuclear testing?

The United States has a formal, Executive Branch, policy against nuclear weapons testing going back more than 25 years. To quote another NGO:

"In 1991, Soviet leader Mikhail Gorbachev announced a unilateral nuclear test moratorium. Later that year, legislation was introduced in the U.S. Congress for a reciprocal test moratorium. The legislation, became law in 1992 and mandated a 9-month moratorium on nuclear weapon test explosions. After it expired, in July 1993, President Bill Clinton decided to extend the U.S. test moratorium, as has every president since. In the 2018 Nuclear Posture Review published by the U.S. Department of Defense, the Trump Administration stated:

> The United States will not seek Senate ratification of the Comprehensive Nuclear Test Ban Treaty, but will continue to observe a nuclear test moratorium that began in 1992. This posture was adopted with the understanding that the United States must remain ready to resume nuclear testing if necessary to meet severe technological or geopolitical challenges.
>
> The United States will not resume nuclear explosive testing unless necessary to ensure the safety and effectiveness of the U.S. nuclear arsenal, and calls on all states possessing nuclear weapons to declare or maintain a moratorium on nuclear testing. U.S. Department of Defense, "Nuclear Posture Review (2018)" at pp. 63 and xvii3 (Nuclear Posture Review).

26/2-b

"Related to this is the fact that the U.S. became the first nation to sign the Comprehensive Test Ban Treaty (CTBT) in 1996, which prohibits all nuclear test explosions and is intended to help curb the spread of nuclear weapons and impede nuclear arms competition. While the U.S. Senate rejected ratification in 1999 and the treaty has yet to enter into force, the U.S. sign-on formally states an official intention of the U.S.' being bound by the CTBT. While an unratified treaty does not pose an obstacle to commencement of the plutonium pit project, the U.S. has contingently ratified the CTBT and the legal effect of the U.S. signature will change to make the treaty binding on the U.S. when a minimum 44 nations have become signatories to it."

"Because the ratification picture could change importantly during the periods of construction and operation of the plutonium pit plant, and the Executive Branch has self-imposed a continued moratorium for a quarter-century, the implications of this policy history must be listed under 40 C.F.R. §1502.25(b) and analyzed within the NEPA documents. What is proposed is a technologically new generation of pit "triggers." Questions of the necessity of producing them, what type of testing would be needed, and the legality both of testing nuclear weapons as (https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF) well as of continuing to produce new weapons components, must be encompassed within NEPA analysis of this project."

News articles in May 2020 raise concerns about any secret, provocative plans of NNSA and the Department of Defense to return to nuclear weapons testing, such as:

- *DoE Could be Ready to Go With Minimal Nuke Test in Nevada in 'Months, Pentagon Official Says*, Defense News, May 26, 2020, https://www.defensedaily.com/doe-ready-go-minimal-nuke-test-nevada-months-pentagon-official-says/nuclear-modernization/

- *US security officials 'considered return to nuclear testing' after 28-year hiatus*, The Guardian, May 23, 2020, https://www.theguardian.com/world/2020/may/23/us-security-officials-considered-return-to-nuclear-testing-after-28-year-hiatus

- *Trump administration discussed conducting first U.S. nuclear test in decades,* Washington Post, May 22, 2020, https://www.washingtonpost.com/national-security/trump-administration-discussed-conducting-first-us-nuclear-test-in-decades/2020/05/22/a805c904-9c5b-11ea-b60c-3be060a4f8e1_story.html

26/2-b
(Cont'd)

Given the proliferation risks it poses, a host of politicians and public interest group have rightly decried any return to nuclear weapons testing.

New-design pits for new-design weapons may be used as a basis by NNSA and DOD to test. Please clarify if there might be a claimed "need" to conduct underground nuclear testing of new pits or refurbished pits in new-design or old-design weapons. If so, please discuss the proliferation impacts and environmental impacts of a return to nuclear weapons testing (issues that must be discussed in the required PEIS).

Other points

Climate change impacts at pit plant considered but not analyzed

The draft EIS says little about climate change:

> Emissions of greenhouse gases (carbon dioxide equivalents) in 2018 at SRS were estimated to be 0.559 million metric tons per year, which is less than 0.009 percent of the total U.S. emissions of 6.457 billion metric tons of carbon dioxide equivalent per year (EPA 2019, p. ES-4). Under the Proposed Action, the estimated total combined greenhouse gas emissions would be approximately 0.00044 percent of the total U.S. greenhouse gas emissions (6.457 billion metric tons of carbon dioxide equivalent in 2017). Therefore, the potential cumulative impacts to global climate change from the Proposed Action would be negligible." (page S-24)
>
> As part of this EIS, NNSA also considered the potential impacts to the SRPPF complex from the potential future climate change. Because of its location outside of existing floodplains and its construction to protect against external events

27/6-d.1

> (including weather-related events) to maintain confinement, it is highly unlikely that future climate change would have a significant impact on the proposed SRPPF. (page 5-7)

The first text extract above addresses "global climate change" and not localized impacts of climate change to the pit site and SRS in general. Global climate change impacts are not the main thing that needs analyzing or the main issue at hand that must be reviewed.

The second extract confirms no climate-change analysis was done and waves away potential impacts without such analysis. Extreme events including tornadoes and hurricanes are possible at the pit plant site and SRS and these could have significant impacts. Impacts at the wider SRS, such as to power supply, transportation, communication and site security could also impact the pit site itself and these impacts must be analyzed. The pit plant will not be an island unto itself at SRS.

27/6-d.1
(Cont'd)

Environmental justice analysis inadequate

The draft document states this on page S-21 about the "Proposed Action: "Minimal "high and adverse" impacts from construction and operations are expected; to the extent that any impacts may be high and adverse, NNSA expects the impacts to affect all populations in the area equally." And this on page S-24: "Based on the analysis of impacts for the resource areas in this EIS, few adverse impacts from construction and operational activities at SRS are expected under the Proposed Action. To the extent that any impacts may be adverse, NNSA expects the impacts to affect all populations in the area equally and cumulative environmental justice impacts are not expected."

And this about the "No-Action Alternative:" "Current and planned activities at SRS would continue as required to support various missions. There would be no disproportionately high and adverse impacts on minority or low-income populations."

28/6-i.2

The sections above and the "Environmental Justice" discussion, section 3.8.2, do not take into account down-wind communities or communities that live at the fence line. The communities that come to mind are in the Barnwell, South Carolina, downwind from prevailing winds, and the Shell Bluff community directly across the Savannah River in Georgia. Were these communities surveyed as to potential impacts in case of accident? The discussion in the draft EIS is superficial and generic in nature and did not review specific, nearby minority communities that could be impacted in case of a nuclear criticality, plutonium fire or other accident.

As we saw with the plutonium fires at Rocky Flats, communities that live downwind and closest to the facility are at greatest risk of exposure.

There needs to be a much better analysis of impacts to minority communities that may live close to SRS or downwind.

What has been the impact of COVID-19 on planning for the Plutonium Bomb Plant, including environmental-impact analysis and how would epidemic impact future operation?

SRS operations moved to "mission critical operations" due to the impact of the coronavirus. As there is nothing essential about planning for the repurposing of the MOX building into a bomb plant, I assume that planning activities were curtailed. Or not? How have reduced staffing on the bomb plant impacted the environmental-impact assessment of the facility? As the project was already under a tremendous rush, always a danger sign for such costly, complex projects, can assurances be offered that the SRS response to the coronavirus will not cause yet more pressure on the planning schedule for the proposed bomb plant and the preparation of mandated NEPA documents (i.e. PEIS followed by site-specific EIS)?

In a May 28, 2020 initial response to my Freedom of Information Act (FOIA) request of March 31, 2020, a SRS lawyer provided me "a list of most of the functions identified as mission essential by DOE-SR." Note that planning for the pit plant is not on the list, implying growing schedule pressure on the already rushed pit project:

> The Department of Energy has identified 14 complex wide mission essential functions that were to be during a continuity event. At Savannah River Site, the following essential supporting activities are the critical functions we are performing to support the continuation of the site based on the mission essential functions identified by Headquarters.

29/8-g

1. Continue Cyber Security program to ensure the integrity and availability of SRS information systems.
2. Ensure the availability of IT maintained applications and systems.
3. Support nuclear chemical separations to recover fissile material from site nuclear reactors and other domestic and foreign research reactors.
4. Support waste management and disposition of solid waste.
5. Maintain Nuclear Material Control & Accountability Program to deter, detect, and respond to theft, loss, or diversion of nuclear materials.
6. Maintain Emergency Services capabilities to monitor and respond to DOE operational emergencies.
7. Support Facility(s) Technical Safety Requirements and Structure, System and Component Design Features.
8. Provide base utilities and maintain SRS infrastructure.
9. Maintain Physical Security systems in nuclear facilities.
10. Maintain Atmospheric Technologies Center meteorological monitoring program.
11. Maintain limited lab functionality for SRNL Research & Development support of site environmental monitoring and regulatory compliance requirements.

12. Ensure the availability of Internal and External Dosimetry and Radiological Instruments.
13. Continue Environmental Monitoring for SRS facilities and operations.
14. Ensure adequate procurement, contracting, and delivery support is available for essential SRS activities.
15. Maintain command, control and direction during COOP emergencies.
16. Continue SRS Medical Operations (Medical and Pro Force Surveillances, HRP).
17. Maintain minimum facility required activities necessary for the safety of human life and the protection of property.
18. Provide essential financial management functions and services.
19. Maintain Personnel Security functions.
20. Operate and maintain biomass-fueled boiler facilities to generate electricity and steam.
21. Safely store and monitor waste storage tanks.
22. Safely temporarily store, process, and monitor highly radioactive waste.

28/8-g (Cont'd)

The list implies that on-site weapons activities could be determined to be non-essential. This raises the spectre that under certain circumstances that pit operations could close for an unknown length of time, or permanently, leaving plutonium stranded at SRS. That is just what people in South Carolina fear - more plutonium and more nuclear waste at SRS with no planned exit route. With this pit plan we now see there will be more nuclear waste at SRS and as MOX has proven, a big federal project that goes bust can leave behind plutonium and other waste with no exit path. Can NNSA off a binding guarantee that plutonium coming in and waste generated at the pit plant will not be stranded in South Carolina?

30/6-j.2

Cut & paste of data on various things and not based on new analysis, including on low-level radioactive waste and mixed low-level radioactive waste

Concerning the *Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement (SPD Supplemental EIS)* (DOE/EIS-0283-S2), the draft EIS on pits says "In this SRS Pit Production EIS, NNSA includes data from the SPD SEIS (NNSA 2015) to address cumulative impacts. The SPD SEIS incorporates and updates data from the SPD SEIS on impacts at SRS and impacts of transportation of materials."

It is not clear why old data from the 2015 SPD SEIS document not related to plutonium processing into pits, via liquid plutonium casting, is being used. Please explain why this document is cited, why it is relevant and why no new and pertinent data on the health impacts and waste generation of the pit plant is not included. Lacking new information directly relevant to pit-production impacts is a significant flaw with the draft EIS and this must be corrected.

31/6-o.2

Additionally, the draft EIS on page S-14 confirms that an estimate (or, actually, a guess – correct?) of "7,800–10,500" cubic yards of low-level nuclear waste per year could be created at the 50 pits-per-year level and that the disposal would be "Onsite disposal at SRS, or SRS ⇒ commercial facility, or SRS ⇒ NNSS (classified LLW)." The documents states that existing waste

32/6-j.6

management facilities at SRS would be used to support SRPPF operations." In section 3.9, various LLW management systems are mentioned in Table 3-18—Types of LLW Disposal Units Used at SRS": Engineered trench, Slit trench, Component-In-Grout trench, Low-activity waste vault and Intermediate level vault. There is no mention of which disposal methods will be utilized for LLW from pit fabrication. It is assumed that pit LLW will end up in unlined trenches or surface vaults which will degrade over time. Such LLW could contain the long-lived plutonium-239 isotope and could radiates more or less 200 millirem per hour at about two inches from container surface.

32/6-j.6 (Cont'd)

Please discuss how much LLW will end up in various of the SRS LLW disposal facilities, including the various unlined trenches. During active operation, are the tranches covered, such as with a movable tent or roof-like structure that prevents rainwater intrusion? Discuss perception in South Carolina of yet more nuclear waste being dumped into trenches or staying on the site forever. (We note that about a mile from the eastern boundary is located the Barnwell LLW dump, a facility utilizing unlined tranches that are not covered to stop rain intrusion that has caused environmental problems and public concerned as it is leaking.)

The draft EIS states that another NEPA document was relied on for WIPP disposal data.

The draft EIS states "For purposes of the cumulative impacts analysis in Chapter 5 of this SRS Pit Production EIS, NNSA assumes the WIPP Disposal Alternative data from the SPD SEIS represents impacts at least as great as those that could result from installing and operating the necessary equipment in the SRPPF. That equipment would include pit disassembly, furnaces for conversion of plutonium metal to oxide, gloveboxes for dilution operations, and associated systems and equipment." (page 2-19)

31/6-o.2 (Cont'd)

Why is the assumption made that data from the *Surplus Plutonium Disposition Supplemental EIS* is relevant to draft EIS on pit production? Provide relevant data from operation of the pit plant to make the case that the SPD SEIS "represents impacts at least as great as those that could result from installing and operating the necessary equipment in the SRPPF." Provide data from recent pit production at LANL, or better said, from attempts at pit production.

The Waste Solidification Building (WSB) was constructed as part of the failed MOX project; will it be involved in the pit project?

The Waste Solidification Building, an essential facility built to handle MOX waste, was mothballed in 2015 long before the MOX project was terminated. The WSB, whose design and construction costs and on-going maintenance costs are charted up to the MOX boondoggle, would be located outside the PIDAS. Will there be any use of this building in handling TRU or other nuclear or chemical wastes from the PBP? Is so, please explain.

33/6-j.18

And, in general, discuss how the various waste streams will be transferred over the PIDAS boundary from the pit plant onto SRS property outside the PIDAS.

Impacts to the pit site of accidents and release from the F-Canyon decontamination and demolition and 235-F are ignored in the draft EIS.

The shuttered F-Canyon and closed 235-F facility, like the partially constructed MOX plant, are located near to the pit plant in F-Area. In case of accidental or uncontrolled release of radioactive materials during decontamination and decommissioning at those facilities, activities at them could negatively impact Plutonium Bomb Plant staff and operations. Please discuss. 34/6-l.8

What is the document relied on for PBP employment calculations?

In *Table S-2—Key Construction Parameters and Wastes for the SRPPF Complex* (page S-12) a documents called "SRNS 2020" is cited for a "peak construction workforce" of 1800 in 2023 and 2024. What documents is "SRNS 2020" and how were worker number calculated? Please provide the document to the public and for the NEPA record. 35/6-h.6

It must be pointed out that a relatively small number of jobs are now involved in planning for the pit plant. If a larger number of jobs for construction and operation do not materialize there will be little impact to SRS employment as the pit jobs are speculative.

Where did determination and calculation of risks and fatalities come from?

On page S-22, we see certain risks listed: "extremely unlikely earthquake with subsequent fire, fire in a single fire zone, explosion in a furnace, nuclear criticality and radioactive material spill." How was this list determined and where did documentation about the risks they pose come from? As no citation is given, please provide it. 36/6-1

Is the data displayed based on pit production, limited as it has been, at the nation's only pit-production site - Los Alamos? Or, from operations at the only other large-scale pit production facility, Rocky Flats? Or, is it speculative?

SRS Watch embraces the comments entered into this record submitted by Dr. Frank N. von Hippel, Senior Research Physicist and, Professor of Public and International Affairs emeritus, Program on Science and Global Security at Princeton University and former Assistant Director for National Security in the White House Office of Science and Technology Policy. Dr. von Hippel supported the No-Action Alternative and deeper examination of pit reuse. In his comments, Dr. von Hippel advocated a decade's delay in making a decision about a second pit site and summarized the key points of his comments:

1. Make it possible to see whether the production line at LANL – presumably the model for the production line at SRS – works or needs to be redesigned.
2. Provide an opportunity for pit experts at LANL and Livermore National Laboratory (LLNL), peer-reviewed by the JASON group, to determine a new lower bound on the functional life of the remarkably durable pits in the current stockpile. 37/1-e

3. Make it possible to settle the national policy debate over scrapping US intercontinental ballistic missiles (ICBMs), which would make it unnecessary to replace the W78 ICBM warhead
4. Provide time for a decision on whether to replace the W76 and W88 submarine-launched ballistic missile (SLBM) warheads and, if so, determine whether the new warheads could be made with refurbished stored pits or require the manufacture of new pits.
5. Allow a broader-scope and deeper review in a Programmatic Environmental Impact Statement of the tradeoffs associated with pit production and reuse before finalizing the site-specific NEPA documents.

37/1-e (Cont'd)

4/4-f (Cont'd)

Dr. von Hippel has submitted an article on pit production to the Bulletin of Atomic Scientists, tentatively titled *Why a decision on a second US plutonium-pit-production factory should be delayed*. When it comes out that article should be included in the EIS record.

Conclusion: The focus at SRS must remain on cleaning up Cold War nuclear and chemical waste - the king of jobs and the budget at SRS - and not on a questionable, ill-conceived pit mission that could stimulate a new nuclear arms race while yielding yet more waste, complicate and delay clean-up and potentially siphon money from clean-up activities by the Office of Environmental Management at SRS and other DOE sites. Due to cost pressure, technical complexities, a rushed schedule and lack of SRS experience with pits, the proposed Plutonium Bomb Plant could end up with the same fate as the MOX disaster.

38/5-a

NNSA must on its own or by court order or congressional directive prepare the complex-wide Programmatic EIS (PEIS) for pit production and postpone finalization of the draft EIS now before us and start the NEPA process anew. Selecting SRS as a pit-production site must be placed on hold and Congress must further assess the wisdom of such a project and new, required plutonium aging data must be gathered and analyzed before things move further with the SRS Plutonium Bomb Plant.

4/4-f (Cont'd)

To reiterate, SRS Watch supports the No-Action Alternative of not locating a pit plant at SRS and not locating those activities at Los Alamos.

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<u>Comments and attachments formally submitted for the NEPA record – please confirm receipt of mailed comments and attachments:</u>

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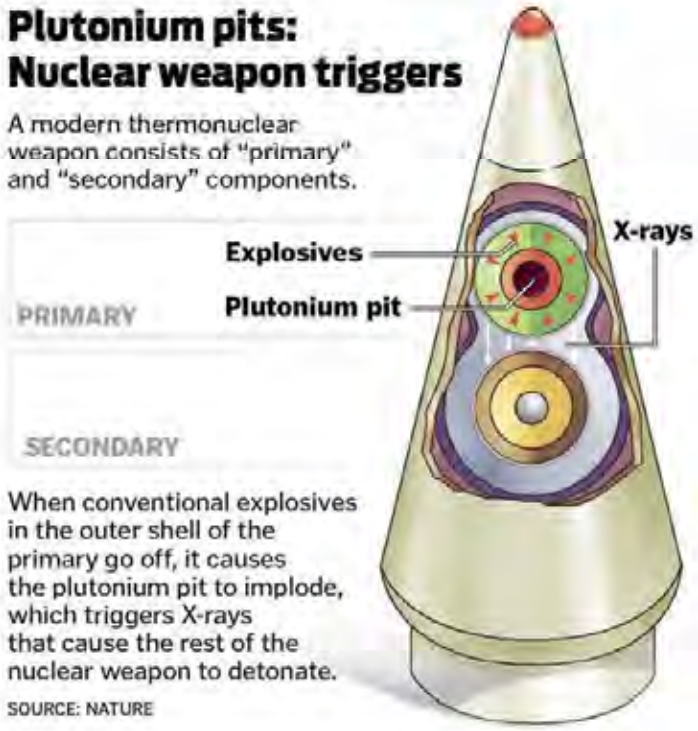
Note: The attachments to these comments – list of them on the following 3 pages – will be mailed, post marked June 1, 2020, along with original of the comments. The comments themselves will be emailed on June 1, without the attachments. Please confirm receipt of mailed comments and attachments.



38

MOX photo submitted for the record. Scene of the crime: Terminated Mixed Oxide Fuel Fabrication Facility (MFFF) at the Savannah River Site, near Aiken, South Carolina, September 16, 2019, (c) High Flyer, 2019, used with permission to SRS Watch. Investigations are needed into fraud, waste, abuse and mismanagement by NNSA and contractors at the MOX debacle. More aerial photos legally taken of the MOX disaster, along with copyright terms, are posted here, by High Flyer: https://drive.google.com/drive/folders/1Fv2S_NWEbu3q568SIFs2RJyubQqCcO9P

39

Attachments to Comments on DOE's National Nuclear Security Administration's *Draft Environmental Impact Statement on Plutonium Pit Production at Savannah River Site; Aiken, South Carolina*

By Tom Clements, Director, Savannah River Site Watch, Columbia, SC, https://srswatch.org/

The following documents are submitted for the formal NEPA record. I expect them to be taken into account in any final EIS that might be issued, as well as in the required Programmatic EIS. These are attached to the printed comments of SRS Watch, mailed in and emailed in on June 1.

Documents form Nongovernmental Organizations and lawyers

1. SRS Watch news release, May 10, 2018, *Initial DOE Decision Expected on New Nuclear Bomb Plant; "Pit" Production Plant at Savannah River Site would Lead to More Plutonium and Nuclear, Toxic Waste at SRS & Magnify Risks of Arms Race*.

2. Nuclear Watch New Mexico, November 16, 2018, factsheet on "Expanded Plutonium Pit Production for U.S. Nuclear Weapons" and problems with that proposal.

3. Nuclear Watch New Mexico, Project on Government Oversight (POGO), SRS Watch, May 21, 2018, Letter to Congress questioning the need for 80 pits per year.

4. Nuclear Watch New Mexico, Tri-Valley CAREs, SRS Watch, October 31, 2018, Letter to NNSA on "Requirement for preparation of a Programmatic Environmental Impact Statement for expanded plutonium pit production."

5. Alliance for Nuclear Accountability, December 7, 2018, Letter to NNSA expressing support for preparation of a PEIS on expanded pit production.

6. Meyer Glitzenstein & Eubanks LLP, lawyers for Nuclear Watch New Mexico, SRS Watch, Natural Resources Defense Council and Tri-Valley CAREs, May 17, 2019, "The need to prepare a Programmatic Environmental Impact Statement in connection with plans to expand plutonium pit production at the Los Alamos National Laboratory in New Mexico and the Savannah River Site in South Carolina."

7. Nuclear Watch New Mexico, SRS Watch, Tri-Valley CAREs news release, June 4, 2019, *Noted Environmental Lawyers Warn Government Not to Expand Production of Plutonium Bomb Cores in Violation of National Environmental Policy Act and Public Review*.

8. Nuclear Watch New Mexico, SRS Watch, Tri-Valley CAREs news release, June 10, 2019, *Federal Government Meets Watchdogs' Demand for Environmental Review of Expanded Plutonium Pit Production.*

9. Eubanks & Associates, LLC, lawyers for Natural Resources Defense Council, Nuclear Watch New Mexico, SRS Watch and Tri-Valley CAREs, September 17, 2019, letter to DOE and NNSA entitled "The abiding need to prepare a new or supplemental Programmatic Environmental Impact Statement for expanded plutonium pit production at the Los Alamos National Laboratory in New Mexico and the Savannah River Site in South Carolina."

10. Nuclear Watch New Mexico, SRS Watch, Tri-Valley CAREs news release, September 17, 2019, *Watchdogs Issue Second Demand for Nation-Wide Review of Expanded Plutonium Pit Production.*

11. SRS Watch, January 2020, factsheet on *Obstacles and Concerns Related to Department of Energy's "Repurposing" of the Abandoned Mixed Oxide Fuel Fabrication Facility (MOX) at the Savannah River Site (SRS) into a Plutonium Bomb Plant to Fabricate Plutonium "Pits" (Triggers) for Nuclear Weapons.*

12. Natural Resources Defense Council, Nuclear Watch New Mexico, SRS Watch, Tri-Valley CAREs news release, January 9, 2020, *Watchdog Groups Claim Nuclear Agency is Moving Forward to Manufacture New Plutonium Bomb Cores in Violation of National Environmental Law and an Existing Court Order.*

13. Natural Resources Defense Council, August 9, 2019, *Comment on NNSA's Draft Supplement Analysis of the 2008 Complex Transformation PEIS.*

14. SRS Watch, August 12, 2019, *Comments on NNSA's Draft Supplement Analysis of the 2008 complex Transformation PEIS that seeks to raise plutonium pit production from 20 pits per year to more than 80, via use of Plutonium Bomb Plant (PBP) at SRS.*

15. SRS Watch, March 27, 2020, news release *While Nation Rallies to Confront Virus, Savannah River Site Takes Eyes off the Threat and Focuses on planning for New Nuclear Arms Race – Draft EIS on Plutonium Bomb Plant (PBP) at SRS Coming April 3.*

16. SRS Watch, May 8, 2020, for the record of the *Draft Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory for Plutonium Operations,* DOE/EIS-0380-SA-06, first page with request for urgently needed supplement on pit reuse and production of purified plutonium, key issues ignored in the draft SA. >> Respond to this request.

Documents related to JASON report on plutonium pit aging

17. JASON group of experts, November 23, 2019, "Letter Report" to NNSA on status of pit aging investigations and failure of NNSA to provide data.

18. NNSA Administrator Lis Gordon-Hagerty, letter to Congress, April 6, 2020, concerning failure to produce required JASON report on plutonium pit aging.

Congressional documents

19. National Defense Authorization Act for Fiscal Year 2015, language on pit production.

20. National Defense authorization Act for Fiscal Year 2016, language on pit production.

21. Appropriations Committee, Energy and Water Development Subcommittee report, April 24, 2015, language on pit reuse.

22. Appropriations Committee, Energy and Water Development Subcommittee report, May 24, 2018, language on requirement by NNSA for new plutonium pit aging report by the JASON.

Articles

23. *The Pit Requalification and Surveillance Programs at the U.S. DOE Pantex Plant*, February 2011, Health Physics Society.

24. *Day in the Life of a Pit*, July 16, 2015, Pantex Plant website post.

25. *Sens. Warren, Sanders, Markey call on defense leaders to chill pit production push*, September 21, 2019, Aiken (South Carolina) Standard.

26. *Pit TRU Waste Would take Up Half of Available WIPP Space over 50 Years*, NNSA Says, January 10, 2020, Exchange Monitor. >> Respond to this news report.

27. *Pit production at Los Alamos offers influential 'template' for Savannah River Site*, February 15, 2020, Aiken (South Carolina) Standard - DOE officials admits production goal of 80 pits per year for 50 years.

28. *SRS to get 'significantly" more waste from DOE plutonium plant*, April 3, 2020, Energy Daily.

29. *Guest Editorial: New Plutonium Warhead Mission at SRS is the Pits*, by Tom Clements, SRS Watch, June 24, 2019, Aiken (South Carolina) Standard.

From: Tom Clements <tomclements329@cs.com>
Sent: Tuesday, June 2, 2020 11:46 PM
To: NEPA-SRS <NEPA-SRS@srs.gov>; NELSON, JENNIFER <Jennifer.Nelson@nnsa.srs.gov>
Cc: nepa.directory@hq.doe.gov; nepa <NEPA@srs.gov>; NEPA-Updates@HQ.DOE.GOV
Subject: [EXTERNAL] Cover messages to 2 draft EIS comments yr. system would not accept on four tries - PLEASE CONTACT ME ASAP

>>> NOTE: Due to system failure, the attachments to my two comments that were rejected on the draft EIS on the proposed SRS pit plant are not included with this message. CONTACT ME ASAP to discuss your failure to accept my comments at NEPA-SRS@srs.gov on June 1 and June 2, 2020. Tom Clements, SRS Watch, 803-834-3084

This is the rejection message I got from another email, to message with attachments between 1-3.2 MB

Message not delivered
There was a problem delivering your message to ***NEPA-SRS@srs.gov****. Contact the remote server administrator for details.*

This is the **fourth attempt** to send in my personal comment. What gives with the email system in not acknowledging my comments? **PLEASE CONFIRM RECEIPT!** Tom Clements

-----Original Message-----
From: Tom Clements <srswatch@gmail.com>
To: NEPA-SRS@srs.gov <>; Tom Clements <tomclements329@cs.com>
Sent: Tue, Jun 2, 2020 9:41 pm
Subject: 3rd attempt: Comments on Draft EIS on SRS Pit Production

Now trying for the 3rd time to get confirmation of receipt of my comments, using a different email address. Please confirm receipt of this message! Tom Clements

---

Comment on draft EIS on SRS pit production, with attachment, June 2, second try

Tue, Jun 2, 2020 4:29 pm
Tom Clements (tomclements329@cs.com)To NEPA-SRS@srs.gov Details
Note: The attached comment was submitted on June 1, via email. As there was no confirmation of receipt I am sending my comments again via email. Please confirm receipt. Thank you - Tom Clements

June 1, 2020

Ms. Jennifer Nelson

NEPA Compliance Officer
National Nuclear Security Administration
Savannah River Field Office
P.O. Box A
Aiken, SC 29802
NEPA--SRS@srs.gov

Re: Draft SRS Pit Production EIS – on Proposed SRS Plutonium Bomb Plant (PBP)

Comments on DOE's National Nuclear Security Administration's *Draft Environmental Impact Statement on Plutonium Pit Production at Savannah River Site; Aiken, South Carolina*

In Bizarre, Dangerous Twist, Facility at SRS Once Endlessly Touted as Pinnacle of Nuclear Non-Proliferation - MOX - Is Transformed into Factory for Proliferation & New Nuclear Arms Race

By Tom Clements, Director, Savannah River Site Watch, Columbia, SC, https://srswatch.org/

Attached, you will find my written comments, also posted on line here:

https://srswatch.org/wp-content/uploads/2020/06/Comments-draft-EIS-Plutonium-Bomb-Plant-by-Clements-June-1-2020.pdf

My written comments with 29 attachments have today been mailed. Due to the length of attachments it was not possible to email them. The comments were postmarked on June 1 and, according to the USPS, the estimated date of arrival is June 4. Please confirm receipt when they arrive.

Thank you.

Tom Clements
Director, Savannah River Site Watch
1112 Florence Street
Columbia, SC 29201
https://srswatch.org/

This is the fourth attempt to send in this comment, which differs from the personal one that I just sent again.

What gives with the email system in not acknowledging my comments? **Please explain what is wrong with your system.**

PLEASE CONFIRM RECEIPT!

Tom Clements

----Original Message----
From: Tom Clements <tomclementssc@gmail.com>
To: NEPA--SRS@srs.gov <>; tomclements329@cs.com
Sent: Tue, Jun 2, 2020 9:44 pm
Subject: 3rd attempt: Comments on Draft EIS on SRS pit Production

June 2, 2020

Ms. Jennifer Nelson
NEPA Compliance Officer
National Nuclear Security Administration
Savannah River Field Office
P.O. Box A
Aiken, SC 29802

NEPA–SRS@srs.gov

Re: Draft SRS Pit Production EIS – on Proposed SRS Plutonium Bomb Plant (PBP)

Comments on DOE's National Nuclear Security Administration's *Draft Environmental Impact Statement on Plutonium Pit Production at Savannah River Site;*
Aiken, South Carolina

By Tom Clements, Director, Savannah River Site Watch, Columbia, SC, https://srswatch.org/

I hereby submit the attached article entitled **Reconsidering U.S. Plutonium Pit Production Plan** for the draft EIS record.

The front-page article appeared in *Arms Control Today* magazine that came out on June 2, 2020. I am submitting the magazine in its entirety.

The article points out difficulties in expanding plutonium pit production, including challenges with the SRS plutonium pit plant:

"Pit production, however, is not the requirement it is claimed to be. Current pit production plans are likely to cost significantly more than estimated, putting increased pressure on an already strained federal budget. Moreover, assessing the underlying assumptions makes clear there are credible alternatives to the scale and planned start date for pit production. Additionally, current plans and their latent potential to ramp up to larger pit production rates raise concerns that the United States is also interested in developing new types of nuclear weapons and expanding the arsenal. This may well feed the potential for an arms race with Russia or China and will also undermine long-standing U.S. commitments to arms control and to a reduction in reliance on nuclear weapons." 1/2-g 2/2-c

The article goes on to point out the politics behind the current pit plans and that the alternatives proposed in the draft EIS are but two options amongst many:

"In assessing the many justifications offered for pit production, Congress has often deferred to the self-interest of a few members. The New Mexico congressional delegation has led the charge for keeping pit production at Los Alamos, but done little to support a more rigorous investigation of environmental safety or oversight of pit production plans. Once the MOX fuel project was terminated, Senator Lindsay Graham (R-S.C.) shifted positions to become a staunch supporter of two pit production facilities because one of these sites would be in his state." 3/1-d

"Seen more broadly, although justifications largely focus on warhead safety and reliability, pit production plans go beyond what is necessary to replicate current nuclear arsenal capabilities. This, in turn, raises concerns that part of the driver for pit production is an interest in new warhead designs and laying the foundation for a potential expansion of the U.S. nuclear arsenal. Both would likely have adverse effects on the global nonproliferation regime and exacerbate tensions with Russia and China. 4/2-d 5/1-g

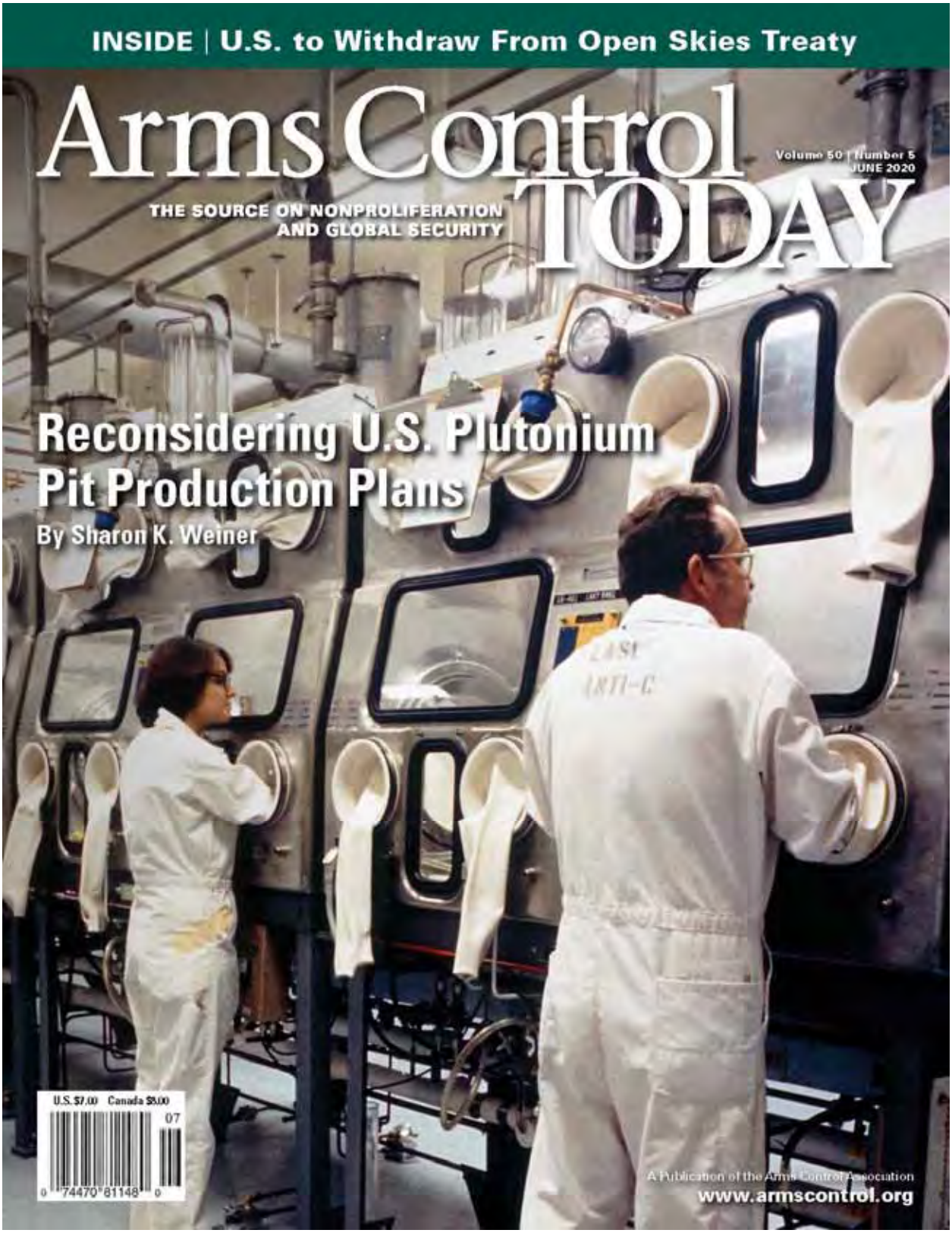
Pit production is not a policy goal in itself. The ultimate purpose of making pits is not to replace those in the current nuclear arsenal or add to this arsenal. It is to maintain a robust nuclear force and posture that can deter potential adversaries. If nuclear deterrence rather than reproducing the status quo or expanded pit replacement is the goal, current pit production plans are not a requirement but one option of many. Given the likely cost and possible adverse effects of current plans, it is important to reevaluate their underlying assumptions and justifications in order to consider the full range of alternatives." 6/1-b

Please respond in EIS about issues raised in the article, including:

- Need, or not, for the dual-pronged pit strategy. 3/1-d (Cont'd)
- Driver for new pit design is new-design nuclear warheads. 5/1-g (Cont'd)
- Pit replacement could result in an expansion of the nuclear arsenal. 2/2-c (Cont'd)
- The SRS pit plant is likely to run far over budget and behind schedule. 7/8-h
- Other alternatives rather than the two options presented in the draft EIS must be considered.

Sincerely,

Tom Clements
Director,
SRS Watch
1112 Florence Street
Columbia, SC 29201


INSIDE | U.S. to Withdraw From Open Skies Treaty
Arms Control TODAY
THE SOURCE ON NONPROLIFERATION AND GLOBAL SECURITY
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JUNE 2020
Reconsidering U.S. Plutonium Pit Production Plans
By Sharon K. Weiner
U.S. $7.00 Canada $8.00
07
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A Publication of the Arms Control Association
www.armscontrol.org


Can the United States afford the growing costs of its nuclear arsenal?
U.S. NUCLEAR EXCESS
HOME
U.S. NUCLEAR BUDGET SKYROCKETS
U.S. NUCLEAR EXCESS
The projected cost of the proposed U.S. nuclear spending spree is staggering, and it is growing. The United States currently plans to spend nearly $500 billion, after including the effects of inflation, to maintain and replace its nuclear arsenal over the next decade. Over the next 30 years, the price tag is likely to top $1.5 trillion and could even approach $2 trillion. This report describes the ways in which this level of spending is unnecessary, unsustainable, and unsafe. It outlines three realistic options to reduce spending on nuclear weapons while still maintaining a devastating nuclear deterrent. The report also recommends key steps Congress can take to enhance affordability and improve its understanding of the underlying policy assumptions and long-term budget challenges.
DOWNLOAD REPORT
Find out more at:
USNuclearExcess.org
The projected cost of the proposed U.S. nuclear spending spree is staggering and it is growing. The United States currently plans to spend nearly $500 billion, after including the effects of inflation, to maintain and replace its nuclear arsenal over the next decade.
USNuclearExcess.org highlights the costs, risks, and alternatives.
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Arms Control TODAY
THE SOURCE ON NONPROLIFERATION AND GLOBAL SECURITY

Volume 50 • Number 5 • June 2020

Cover photo: Workers use a glovebox to handle plutonium compounds at a processing plant at Los Alamos National Laboratory. (Photo: U.S. Energy Department/Science Photo Library)

News and Analysis

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FOCUS

By Daryl G. Kimball
Executive Director

Begin With New START, Not a New Arms Race

Three and a half years since taking office, the Trump administration has failed to develop, let alone pursue, a coherent nuclear arms control strategy. The administration's official nuclear policy document, the "2018 Nuclear Posture Review," barely discusses arms control as a risk reduction tool. It passively states that "the United States will remain receptive to future arms control negotiations if conditions permit."

But President Donald Trump says he would like to work with Russian President Vladimir Putin "to discuss the arms race, which is getting out of control." Since April 2018, Trump and his advisers have talked about somehow involving China in nuclear arms control yet they have failed to explain how to do so.

Meanwhile, Trump has rebuffed Russia's offer to extend the only remaining nuclear arms control treaty, the 2010 New Strategic Arms Control Treaty (New START), by five years. This can be accomplished through an executive agreement that must be concluded before the treaty expires Feb. 5, 2021.

Having wasted valuable time, team Trump is now threatening to allow New START to expire and launch a new arms race unless Russia, as well as China, agree to a new and more ambitious arms control deal involving all types of nuclear weapons, strategic and nonstrategic. *The Washington Post* reported May 22 that senior administration officials even discussed the option of a demonstration nuclear test explosion as a way to pressure the Russian and Chinese leaders to accept the U.S. terms. This would not advance arms control; it would be an invitation for other nuclear-actors to follow suit; and it would blow apart the nonproliferation regime.

Discarding New START without a replacement agreement would be foreign policy malpractice.

The president's new "arms control" envoy, Marshall Billingslea, told *The Washington Times* on May 7 that before there is talk about extension of New START, Russia must "bring the Chinese to the negotiating table." In remarks on May 21, Billingslea said that "any potential extension of our existing obligations must be tied to progress towards a new era of arms control."

Serious pursuit of deep cuts in all types of nuclear weapons in the bloated U.S. and Russian arsenals and engaging other nuclear-armed states in disarmament talks are crucial. But there is no possibility of concluding a new and complex nuclear deal before New START expires, and discarding New START without a replacement agreement would be foreign policy malpractice.

Negotiations to account for, reduce, and eliminate U.S. and Russian nonstrategic nuclear weapons are overdue, but they will not be easy. Russian officials say they are prepared to talk about these weapons, but only if U.S. leaders are prepared to address Russian concerns, including U.S. missile defenses—an issue U.S. officials, including Billingslea, say is non-negotiable.

Leaders in Beijing have repeatedly said they are not interested in an arms control deal as long as Russian and U.S. nuclear arsenals remain orders of magnitude larger than China's. Russian officials say they are open to talks with China, but it is up to Washington to bring Beijing to the table, and they want France and the United Kingdom involved in any such talks.

Unfortunately, the administration's entire approach seems to be based on an exaggerated and naive belief that tough talk and threats will somehow coerce Russia and China to make major unilateral concessions. In remarks broadcast on May 21, Billingslea said the United States would not hesitate to engage in a costly nuclear arms race if China and Russia do not agree to U.S. terms. "We know how to win these races, and we know how to spend the adversary into oblivion," he said.

Even the Trump administration's former undersecretary for arms control and nonproliferation, Andrea Thompson, is skeptical about the administration's tactics. "China is not going to come to the table before February of next year," Thompson told *Newsweek* on May 14. "There's no incentive for them to come to the table."

U.S. allies and U.S. military and intelligence officials greatly value the New START limits and its inspection capabilities, which provide predictability and transparency. As Adm. Michael Mullen, the former chairman of the U.S. Joint Chiefs of Staff, said on April 29, "Put me down in the column of extension, and the reason for that is the clock is running. Certainly, in my experience, getting to the right specifics in a very complex treaty takes a long time."

The administration's unserious approach on New START—a pattern of behavior that led to its decisions to withdraw from the Open Skies Treaty, the Intermediate-Range Nuclear Forces Treaty, and the Iran nuclear deal—suggests it may simply be seeking a pretext for exiting yet another valuable risk reduction agreement without a plan B.

If Trump genuinely wants to constrain and reduce the nuclear capabilities of major adversaries, the first and best step is to promptly agree to extend New START by five years. This would create the time and the right environment for follow-on disarmament talks with Russia and serious give-and-take discussions with China on risk reduction options, including a possible freeze of the size of China's arsenal and joint stockpile declarations.

Unless the White House shifts course and soon, the United States may lose the benefits of New START, and Trump will have opened the door to a more dangerous and costly phase of the global nuclear arms race, which everyone stands to lose. **ACT**

InBRIEF

June 2020

Notable Quotable

"The possibility that the Trump administration may resume nuclear explosive weapons testing in Nevada is as reckless as it is dangerous. We have not tested a device since 1992; we don't need to do so now."

—Former Vice President Joe Biden, May 28.

BY THE NUMBERS IAEA Safeguards Activities in 2019

183 States where safeguards were implemented	**717** Facilities under safeguards	**137** States with additional protocols in force
216,448 Significant quantities of nuclear material under safeguards	**2,179** Inspections	**13,139.5** Calendar days in the field for verification

Source: IAEA Safeguards Implementation Report, 2020

ON THE CALENDAR

June 2	18th anniversary of the signing of the Strategic Offensive Reductions Treaty
June 8	First Preparatory Meeting of the Second Review Conference of States Parties to the Convention on Cluster Munitions
June 13	18th anniversary of the U.S. withdrawal from the Anti-Ballistic Missile Treaty
June 15–19	Meeting of the International Atomic Energy Board of Governors, Vienna
June 15–19	7th biennial meeting of the UN Program of Action on Small Arms and Light Weapons, New York
June 22–June 26	Meeting of the Convention on Certain Conventional Weapons related to emerging technologies in the area of lethal autonomous weapons systems, Geneva
June 25–26	54th Session of the CTBTO Preparatory Commission, Vienna
July 1–July 31	94th Session of the Organisation for the Prohibition of Chemical Weapons Executive Council, The Hague
July 16	75th anniversary of the Trinity test
Aug. 6	75th anniversary of the first combat use of the atomic bomb, Hiroshima
Aug. 9	75th anniversary of the second combat use of the atomic bomb, Nagasaki
Aug. 10–14	Meeting of Convention on Certain Conventional Weapons group of governmental experts on lethal autonomous weapon systems, Geneva
Aug. 17–21	Sixth Conference of States Parties to the Arms Trade Treaty, Geneva
Aug. 29	International Day Against Nuclear Tests and the 71st anniversary of Russia's first nuclear test
September	46th Group of Seven summit, Camp David (postponed from June)
Sept. 4	Second Preparatory Meeting of the Second Review Conference of States Parties to the Convention on Cluster Munitions
Sept. 14–18	Meeting of the International Atomic Energy Board of Governors, Vienna
Sept. 17–30	75th session of the UN General Assembly
Sept. 26	International Day for the Total Elimination of Nuclear Weapons
Sept. 28	Meeting of the International Atomic Energy Board of Governors, Vienna
Oct. 5–8	55th session of the CTBTO Advisory Group, Vienna
Oct. 5–Nov.5	Meeting of the UN General Assembly First Committee, New York

45 *Years Ago in ACT*

Report From Geneva

"What I, and perhaps a few other optimists were less prepared for, was the degree of acrimony and discord that permeated much of the [1975 nuclear Nonproliferation Treaty Review Conference] discussion, chiefly of more political problems, and that may in some subtle ways make the NPT regime less stable in the future."

—Thomas A. Halsted, June 1975

By Sharon K. Weiner

Reconsidering U.S. Plutonium Pit Production Plans

U.S. efforts to produce and maintain the plutonium cores of its nuclear weapons have endured a troubled history of safety and environmental problems since the first plutonium was produced in Hanford, Washington, in 1944. These hollow metal cores, each weighing several kilograms, enable the initial, explosive chain reaction in nuclear weapons.[1] The last pit production facility at Rocky Flats was closed in 1989 due to widespread contamination and negligence. In the 1990s, pit production essentially stopped as arsenals declined. Although pit production was eventually relocated to Los Alamos National Laboratory, the lab struggled to produce more than a handful, if any, pits in any given year.

Yet, pit production ambitions persisted. The Obama administration's nuclear modernization plans gave impetus to a variety of schemes and in the fiscal year 2015 National Defense Authorization Act (NDAA), Congress required the National Nuclear Security Administration (NNSA), the semiautonomous nuclear weapons agency of the Department of Energy, to build a facility that could demonstrate an annual production capacity of 80 pits. Although several plans for such a facility at Los Alamos were proposed, each was postponed or abandoned because of unclear justifications, budget shortfalls, or both.

Under the Trump administration, pit production efforts have enjoyed new momentum. In 2019, Congress set the requirement not only to demonstrate capacity but to produce at least 80 pits per year by 2030. The administration also made pit production a budget priority. The Energy Department's fiscal year 2021 budget request asks for about $1.4 billion to support plans for production of new plutonium pits, a massive increase of $570 million over the fiscal year 2020 appropriated level. The NNSA plans to build two pit production facilities: one at Los Alamos and a second, larger facility in South Carolina at the Savannah River Site.

Pit production, however, is not the requirement it is claimed to be. Current pit production plans are likely to cost significantly more than estimated, putting increased pressure on an already strained federal budget. Moreover, assessing the underlying assumptions makes clear there are credible alternatives to the scale and planned start date for pit production. Additionally, current plans and their latent potential to ramp up to larger pit production rates raise concerns that the United States is also interested in

Sharon K. Weiner

Marine Gen. Joseph F. Dunford Jr. (left), then chairman of the Joint Chiefs of Staff, watches a demonstration of the transporters used for Minuteman III ICBMs at Minot Air Force Base, N.D., in 2016. The Air Force is planning to replace all of its W87 ICBM warheads with new W87-1 warheads that will require newly produced plutonium pits. (Photo: Dominique Pineiro/U.S. Navy/Joint Chiefs of Staff)

developing new types of nuclear weapons and expanding the arsenal. This may well feed the potential for an arms race with Russia or China and will also undermine long-standing U.S. commitments to arms control and to a reduction in reliance on nuclear weapons.

Cost and Schedule Problems (Again)

To meet the production goal of 80 pits by 2030, the NNSA intends for Los Alamos to make 30 pits per year, with the rest to be produced at the Savannah River Site. According to a January 2019 analysis by the Congressional Budget Office, the estimated cost of NNSA pit production plans are $9 billion over the next decade.[2] Yet, past performance and multiple independent assessments raise questions about the ability of the NNSA to deliver on time and within budget.

One set of concerns involves the facilities at Los Alamos. Since the closure of Rocky Flats, Los Alamos has led the charge for reconstituting pit production despite numerous setbacks to its plans and facilities. Its Plutonium Facility Building 4 (PF-4), the site of current pit production activities, is supposed to install a production capacity of 10 pits per year and then ramp up to a capability of making 30 pits per year by 2026, but the facility may not be up to the task. Los Alamos produced only five prototype pits in fiscal year 2019, which are not the "war reserve" pits that meet that standards for deployment on nuclear weapons. PF-4 is seeking to be able to produce its first such pit in 2023.

Designed in the 1970s, PF-4 lacks important safety features and has a history of safety problems. For example, in 2013, Los Alamos paused work at PF-4 for three years after the Defense Nuclear Facilities Safety Board noted a variety of ongoing problems, including violations of rules intended to ensure the safe storage of plutonium. According to safety experts, Los Alamos lacked enough personnel "who knew how to handle plutonium so it didn't accidentally go 'critical' and start an uncontrolled chain reaction."[3] In 2016 the lab had to cancel its plans to resume work at PF-4 because of concerns over safety. The lab also has repeatedly been criticized for lacking plans to mitigate risks from local forest fires and seismic activity, even though concerns about both have increased in recent years. Although pit work resumed in 2017, the Defense Nuclear Facilities Safety Board documented problems with delayed and incomplete upgrades to safety controls.[4] Add in broader problems with the safety culture at Los Alamos, and this suggests that accidents will remain a concern.

Any pit manufacturing facility is likely to take significantly longer than anticipated, cost much more than planned, and require significant revisions to succeed.

PF-4 is also crowded because of its other plutonium missions. In addition to pit production, the facility converts excess weapons-grade plutonium into plutonium dioxide in preparation for its storage or disposition. It also supports NASA by processing plutonium-238, which is used as an energy source for space missions. Yet, there are limits on how much plutonium can be in an area at any one time. It is not clear that PF-4 can expand pit production without shortchanging disposition activities or NASA or violating safety standards.

Los Alamos's planning of pit-related facilities has also been problematic. Technical analysis on pit sample material was to be performed at a new Chemistry and Metallurgy Research Replacement-Nuclear Facility. That project was terminated in 2014 after significant cost overruns and a failure to meet environmental regulations for the handling and disposal of nuclear waste. The Radiological Laboratory Utility Office Building, which provides facilities for a variety of activities related to plutonium work, was completed in 2010, but had a leak in its radioactive waste system in 2019. Prior to current pit production plans, the NNSA was criticized for pushing the adoption of Los Alamos's "modular" plan to increase space for plutonium work without adequate analysis of the risk of failure, alternatives, or cost.[5]

The military's frustration with Los Alamos's repeated failures is rumored to be behind the addition of a second pit production facility. This larger facility, the Savannah River Plutonium Processing Facility (SRPPF), is intended make 50 pits per year. The SRPPF will be housed in a repurposed building that was to have been the Mixed Oxide Fuel Fabrication Facility, originally intended to convert excess weapons-grade plutonium into nuclear reactor fuel. The NNSA was finally persuaded to cancel the mixed-oxide (MOX) fuel project in 2018 after its original cost of $1.6 billion ballooned to potentially more than $100 billion.[6] Left behind was an unfinished concrete shell primed for plutonium work. In 2018 the building was estimated to be about 70 percent complete. About one-quarter of this construction, however, needed to be redone because of improper installation, failure to meet required regulations, and a host of other problems.[7] It is unclear what other problems may arise in trying to turn this incomplete building into a pit production facility.

Independent analysis has called into question the NNSA's ability to meet pit production requirements at Los Alamos and Savannah River. A 2019 assessment found that although redundant facilities would provide a buffer against natural disasters, such as earthquakes, hurricanes, or fires, or geopolitical developments leading to a more hostile international environment, neither Los Alamos nor the SRPPF could alone produce 80 pits per year.[8] The assessment also concluded that because the NNSA has difficulties managing large projects, it is very risky to assume current pit production plans will be finished on schedule and without significant cost overruns.

Any pit manufacturing facility is likely to take significantly longer than anticipated, cost much more than planned, and require significant revisions to succeed. These problems may not be amenable to a better management solution. They reflect what has been identified as a larger, enduring problem at the NNSA and the Energy Department. Despite years of trying to improve project management, the NNSA remains on the Government Accountability Office's list of government organizations that are at high risk of "fraud, waste, abuse, and mismanagement" due to its track record and current practices.[9]

Even if current plans succeed, other complications flow from the redundancies built into them. The 2019 NDAA requires Los Alamos to make plans to produce up to 80 pits per year on its own, in the event that the SRPPF is not ready in time.[10] Additionally, the SRPPF is a large facility that could make 80 pits per year or more on its own.[11] The potential redundancy built into the twin pit production projects could lead to an effective capacity to produce at least 160 pits per year.

There are political risks to this redundancy. Domestically, pit production has raised concerns about the ability of Los Alamos and the Savannah River Site to ensure environmental safety. Los Alamos, for example, is on or near several known earthquake faults, and the Savannah River Site is vulnerable to wind and flood damage from hurricanes. The politics of "not in my backyard" are also significant. South Carolina, for example, sued the Energy Department for failing to meet its promise of removing all plutonium from the state. Further, pit production at the Savannah River Site will require moving more plutonium across the United States. Instead of shipping pits some 300 miles from their current storage site at the Pantex Plant in Texas to Los Alamos, they will travel almost 1,000 additional miles to get to the Savannah River Site.

Internationally, the plan raises concerns that the United States may be interested in expanding its nuclear arsenal with many more weapons or a large number of warheads with new capabilities. At a rate of 160 pits per year, the United States in less than three years would be able to build as many new nuclear weapons as are believed to be in China's current arsenal. The uncertain future of the U.S.-Russian New Strategic Arms Reduction Treaty (New START), which limits each country

to 1,550 deployed strategic warheads, is a particular concern. That agreement is set to expire in 2021, and the Trump administration has resisted efforts to work toward a five-year extension. If the treaty expires with nothing to replace it, there will be no legally binding limits on U.S. and Russian nuclear arsenals for the first time in half a century.

The Argument for 80

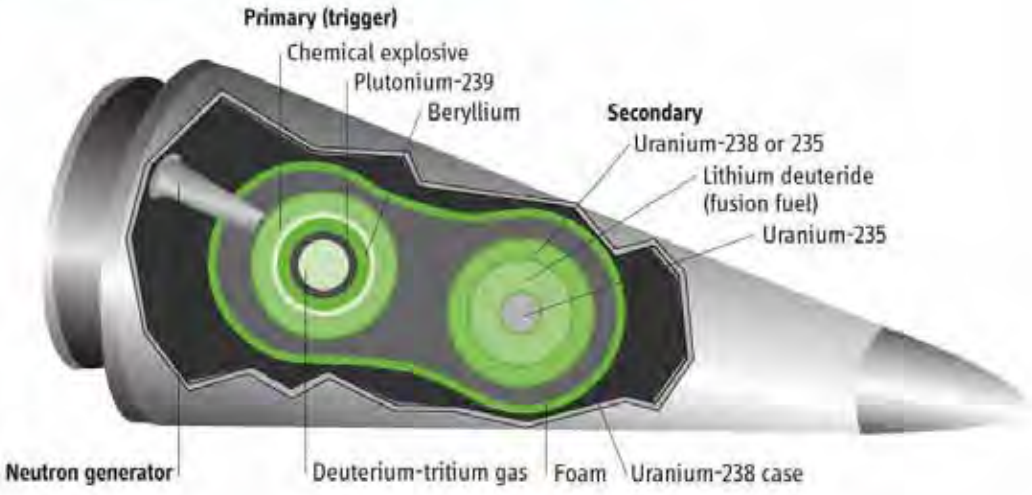
The NNSA provides two main justifications for creating an 80-pit-per-year production capability by 2030. One rests on assumptions about pit aging, and the other on enhancing warhead safety.

The most frequent argument in support of pit production focuses on size of the U.S. stockpile as warheads age. The current U.S. arsenal is estimated to include about 3,800 warheads, of which 1,750 are currently deployed and the remainder are in a reserve in various stages of readiness.[12] The pits for these warheads were all manufactured between 1979 and 1990. Even though all warheads that will remain in the arsenal are scheduled to undergo life extension programs (LEPs), current plans assume that all of these pits must be replaced before they reach an age past which they might no longer work reliably due to problems with corrosion or plutonium decay. As explained by Peter Fanta, the deputy assistant secretary of defense for nuclear matters late last year, "Want to know where 80 pits per year came from? It's math. Alright? It's really simple math. Divide 80 per year by the number of active warheads we have—last time it was unclassified it was just under 4,000—and you get a timeframe."[13]

How old is too old for a pit? In the early 2000s when the NNSA was considering building a capacity for producing between 125 and 450 pits per year, the weapons labs argued that pits will perform as designed for 45 to 60 years.[14] In 2006 that estimate was significantly increased based on a series of studies at the weapons labs, plus an external evaluation by JASON, an independent group of scientists who consult on technical matters related to national security. According to the JASON study, "[m]ost primary types have credible minimum lifetimes in excess of 100 years as regards aging of plutonium; those with assessed minimum lifetimes of 100 years or less have clear mitigation paths that are proposed and/or being implemented."[15] A 2012 assessment by the weapons lab at Lawrence Livermore National Laboratory went even further, putting pit lifetimes at 150 years.[16] In 2019, a few months after the NNSA took over the funding contract for JASON research from the Department of Defense, the group issued a letter explaining that "the present assessments of aging do not indicate any impending issues for the stockpile" but implying discomfort with pits beyond 80 years old and supporting the "expeditious" reestablishment of a pit production capacity because "a significant period of time will be required to recreate the facilities and expertise" needed to manufacture plutonium pits.[17]

Under the conservative estimate of 100 years of pit life before replacement, the youngest pits in the stockpile today will age out in 2090. If pit production begins

Pits, Chemical Explosives, and Other Warhead Parts



Note: The chemical explosive can be a conventional high explosive or an insensitive high explosive.
Source: International Panel on Fissile Materials

in 2030, that would require 63 pits per year in order to replace all pits before the last one reaches 100 years of age sometime in 2090. At the rate of 80 pits per year, pit production need not begin until 2042 (table 1).

Another variable is the size of the nuclear arsenal. As part of the Obama administration's Nuclear Posture Review, the military agreed that it could meet its deterrence and war-fighting requirements with about 1,000 deployed nuclear weapons.[18] Each of those 1,000 deployed weapons having a backup in the stockpile would result in an overall arsenal size of 2,000 warheads, rather than the 3,800 warheads today, which relaxes even further the requirements for pit production. Assuming pits age out after 100 years, a requirement to replace all 2,000 warheads could be met by producing 33 pits per year starting in 2030 or by producing 80 pits per year starting in 2065. The arguments for pit production starting in 2030 or for 80 pits per year appear to be choices rather than requirements (table 1).

Rather than assumptions about plutonium aging, it appears that the push to begin pit production by 2030 is based on plans for the newly designed W87-1 warhead and arguments about the need for enhanced warhead safety features.[19] All warhead pits are encased in an explosive shell that surrounds the pit and compresses it to begin the chain reaction that produces the explosion. Three warheads currently use conventional high explosive (CHE): the W88 and W76 warheads on submarines and the W78 warhead on intercontinental ballistic missiles (ICBMs). Moving to insensitive high explosive (IHE), which is less vulnerable to shock and heat, would lower the risk for accidents that could lead to the dispersal of plutonium. Because a greater weight and volume of IHE is required to drive compression in a primary, for some warhead types a shift to IHE may require a different pit design and thus the manufacture of new pits.[20]

Under the conservative estimate of 100 years of pit life before replacement, the youngest pits in the stockpile today will age out in 2090.

The Navy has long argued that it prefers its own warheads even if they contain CHE. Shifting to IHE would have implications for missile range and the design of reentry vehicles.[21] Naval resistance is one of the reasons for the demise of plans for an interoperable warhead, a suite of three new warhead designs proposed under the Obama administration that would have allowed the same IHE warhead to fit on Navy and Air Force ballistic missiles. Similarly, the Navy opted to "refresh" the CHE on the W88 rather than redesign warheads and missiles. The close quarters on a submarine, plus the periodic removal of missiles and refit of the submarine, would presumably make the Navy especially sensitive about warhead safety. Unlike the Air Force, the Navy has never had an accident that led to the dispersal of plutonium. The Navy's safety record, plus its resistance to opting for IHE-based warheads, calls into question the merits of NNSA arguments about the need to redesign warheads and make new pits in order to increase safety.

The Air Force, which operates land-based ICBMs and has had plutonium-dispersal accidents, prefers warheads with IHE. The NNSA and the Air Force have approved replacing the W78, which contains CHE, with a new warhead named the W87-1 because it is based on the design of the W87-0, the other ICBM warhead, which already uses IHE.[22] Once completed, all ICBM warheads would

Table 1. Pit Production Variables

Maximum Pit Age	Arsenal Size	Start Date for Production	Pits per Year
125 years	3,800	2030	45
	2,000		24
125 years	3,800	2067	80
	2,000	2090	
100 years	3,800	2030	63
	2,000		33
100 years	3,800	2042	80
	2,000	2065	
80 years	3,800	2030	95
	2,000		50
80 years	3,800	2022	80
	2,000	2045	

contain IHE. According to the NNSA, the new W87-1 is to be in place by fiscal year 2030, in time to arm the next-generation ICBM, the Ground-Based Strategic Deterrent (GBSD), which is optimistically slated for deployment starting in 2029 and lasting through 2036.[23] Meeting this eight-year schedule requires the capability to produce on average 75 pits per year if the estimated 600 W78s in the current arsenal are all replaced with the new W87-1 by the time all the new GBSD missiles are deployed.[24] To be ready in time, the NNSA argues that the United States has to begin building a pit production facility now, partially because it may take as long as 15 years to bring any new pit production facility into operation.[25]

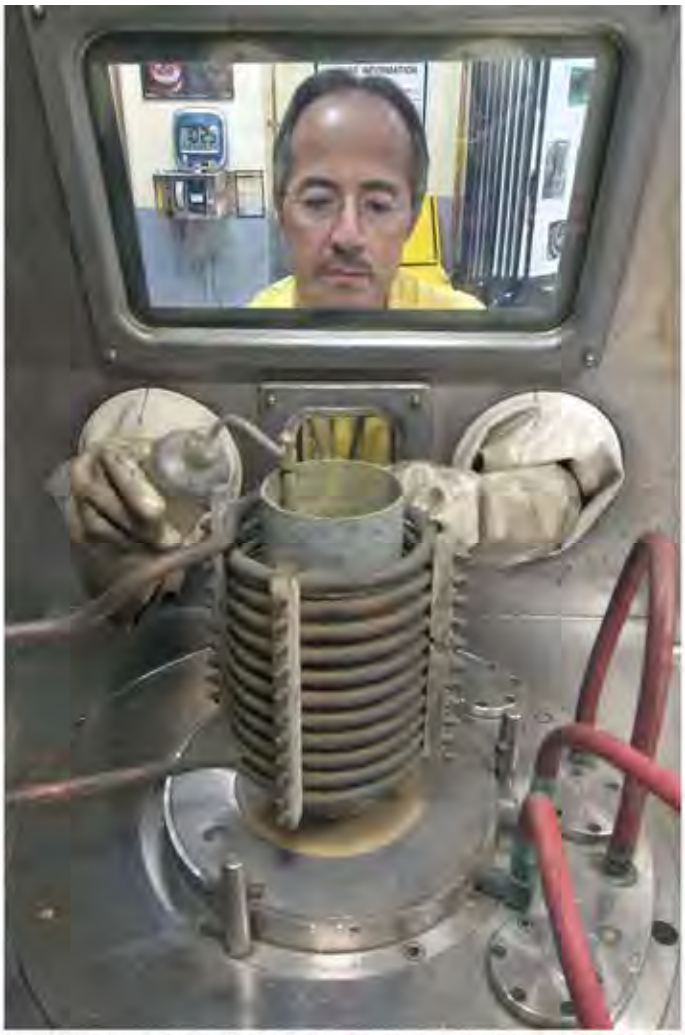
There are several reasons why 2030 is still not a hard start date for pit production. The schedule for the GBSD program may slip; delays are not uncommon in major acquisition programs. More significantly, instead of making a new warhead, the Air Force could replace any problematic W78 warheads with W87-0 warheads. The W87-0 completed an LEP in 2004. This gave additional shelf life to the estimated 200 such warheads already deployed on Minuteman III missiles. Plus, there are believed to be enough extra W87-0 warheads in the stockpile to replace the 200 deployed W78 warheads and even have spares left over.[26] The NNSA has argued that fear of a failure in an entire class of warheads means it is prudent to have at least two different designs for each delivery system. Plans to replace the W78 with a warhead based on the design of the other ICBM warhead, however, suggest there is room for compromise.

Even if all ICBMs are not outfitted with the W87, the W78 likely still has some life left, even though it is the oldest warhead in the arsenal. Manufactured between 1979 and 1982, the pits in these warheads have at least another 40 years of life before they may need to be replaced.

Pits at Any Price

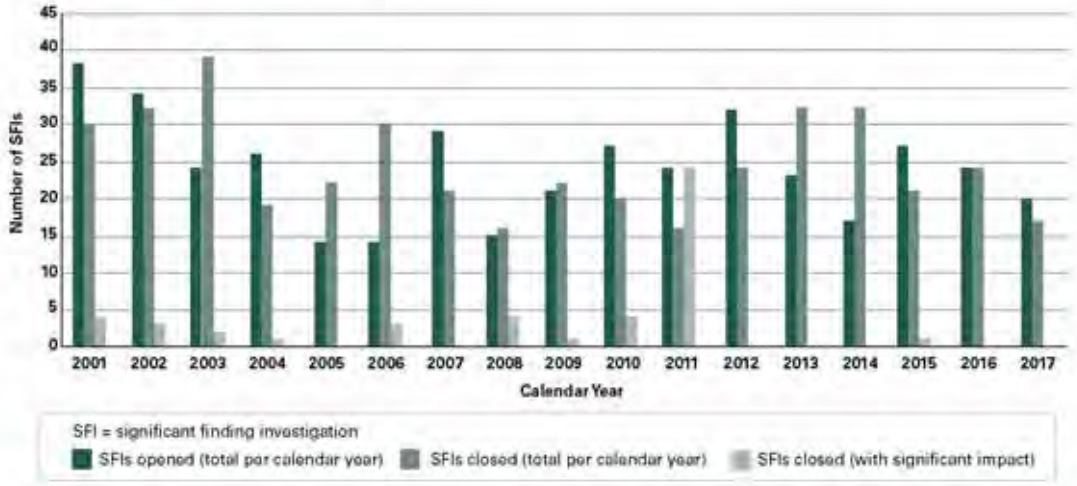
Irrespective of production numbers and start date, both the NNSA and U.S. Strategic Command have stated that pit production is one of their highest priorities. Their justifications, however, are derived from ambiguous evidence that suggest judgment calls shaped by institutional self-interest rather than strict technical requirements.

One argument is that pit production is necessary as a hedge against the unexpected discovery of a problem that may affect an entire class of warheads. Details about such "significant findings" that might suggest issues that could mandate replacing an entire class of warheads are classified. In 1996 the General Accounting Office reported that from 1958 to 1996, there were about 1,200 significant findings of which less than 200 identified failures in some component of a weapon system.[27] Unknown is how many of these problems were associated with pits. In 2001 the Energy Department's inspector general provided an update, stating that "[s]ince 1958, more than 1200 significant findings have been identified. About 120 findings have resulted in retrofits or major design changes to the nuclear weapons stockpile."[28] Although five years had passed since the 1996 report, it seems that the number of significant findings was largely unchanged. This should suggest confidence in the Stockpile Stewardship Program rather than plans to replace all pits.



A technician at Los Alamos National Laboratory manipulates plutonium as part of the U.S. Stockpile Stewardship Program in 2005. The laboratory has sought a major role in producing new plutonium pits despite an uneven safety record.
(Photo: U.S. Energy Department)

Table 2. Significant Findings



Historical number of significant finding investigations opened, closed, and closed with significant impact for calendar years 2001 to 2017. Source: National Nuclear Security Administration, U.S. Department of Energy, "Fiscal Year 2019 Stockpile Stewardship and Management Plan - Biennial Plan Summary: Report to Congress" October 2018, p. 3-6

More reasons to question the need for pit production can be found in the results of warhead surveillance testing since 2001 (table 2). Even with a robust testing schedule, the number of findings that required modifications to some part of the warhead has declined over time and remains at or near zero. Moreover, according to the NNSA, some significant findings can be mitigated in ways that do not require a new pit.[29]

The 30-year absence of pit production capability, plus the focus on warhead LEPs instead of replacement, suggest major unexpected problems seldom or never appear. Additionally, if a technical problem goes undetected for decades but suddenly calls into question the functionality of an entire class of warheads, there are enough spares in the active and reserve stockpiles to replace those warheads or provide additional deployed warheads on other delivery systems.

The NNSA has argued that warheads need to function "as designed."[30] The nuclear weapons research and design labs have also made the case that new designs are necessary in order to maintain a cadre of experts in weapons design. Specialty nuclear weapons for niche functions, such as the mid-2000s proposal for a Robust Nuclear Earth Penetrator, have also been a driver. Collectively, these justifications raise concerns that conservative assumptions about pit age and replacement are at least partially a function of concern for jobs and future missions.

Another area that is open to interpretation is the relationship between pit age and military requirements. Military requirements focus on the degree of certainty that a nuclear weapon will launch, arrive, and explode as planned within a defined range of planned parameters. Military requirements are also classified, but it is not clear that a warhead's ability to meet requirements drops precipitously once it reaches a certain age. Further, it may be possible to relax requirements or modify delivery systems in other ways without jeopardizing the deterrent value of nuclear weapons. For example, in 2016 the Nuclear Weapons Council authorized an increase in the amount of tritium in U.S. nuclear weapons because of concerns about performance reliability.[31]

The current U.S. moratorium on explosive nuclear testing is sometimes offered as a justification for pit production. The Pentagon's "Nuclear Matters Handbook 2020" suggests uncertainties about warhead performance might be addressed by changing warhead designs. According to the Defense Department, "Eventually, all of the weapons in the legacy stockpile will need to be replaced by new warheads whose designs place a premium on yield margin so that they can be certified without the benefit of nuclear explosive testing."[32] Yet instead of setting military requirements for individual components of the warhead, those requirements could apply to the weapon system overall. This would allow for any deficiencies in yield to be compensated by improvements in accuracy or other changes.

Pits and Politics

In assessing the many justifications offered for pit production, Congress has often deferred to the self-interest of a few members. The New Mexico congressional delegation has led the charge for keeping pit production at Los Alamos, but done little to support a more rigorous investigation of environmental safety or oversight of pit production plans.[33] Once

the MOX fuel project was terminated, Senator Lindsay Graham (R-S.C.) shifted positions to become a staunch supporter of two pit production facilities because one of these sites would be in his state.

Seen more broadly, although justifications largely focus on warhead safety and reliability, pit production plans go beyond what is necessary to replicate current nuclear arsenal capabilities. This, in turn, raises concerns that part of the driver for pit production is an interest in new warhead designs and laying the foundation for a potential expansion of the U.S. nuclear arsenal. Both would likely have adverse effects on the global nonproliferation regime and exacerbate tensions with Russia and China.

Pit production is not a policy goal in itself. The ultimate purpose of making pits is not to replace those in the current nuclear arsenal or add to this arsenal. It is to maintain a robust nuclear force and posture that can deter potential adversaries. If nuclear deterrence rather than reproducing the status quo or expanded pit replacement is the goal, current pit production plans are not a requirement but one option of many. Given the likely cost and possible adverse effects of current plans, it is important to reevaluate their underlying assumptions and justifications in order to consider the full range of alternatives.

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By Rüdiger Lüdeking

Nuclear Disarmament and Nonproliferation in Times of the Coronavirus Pandemic

Just a few weeks ago, no one could have imagined that the crisis sparked by the spread of the coronavirus would have such a far-reaching impact on daily life. The effects on almost all spheres of life as well as on global politics are severe. The broader effects of the pandemic cannot yet be conclusively assessed, but it is fair to say it adds to the already overburdened global agenda.

As the Science and Security Board of the *Bulletin of the Atomic Scientists* warned in January of this year, even before the coronavirus pandemic entered the public consciousness, there are two simultaneous, existential threats—climate change and the possibility of nuclear war—that put humanity closer to disaster than ever before since the end of the Second World War. The *Bulletin's* Doomsday Clock has been set to just 100 seconds to midnight. Even more importantly, the international community and world leaders have been complacent in the face of this dire state of affairs and have failed to address these two key challenges together and effectively. The trend toward national isolationism and inadequate international cooperation has exacerbated the terrible impacts of the COVID-19 pandemic.

Climate change is the subject of intense political debates and an impressive engagement and commitment on the part of civil society, and in the past few weeks, there have been increasing warnings not to lose sight of this topic despite the COVID-19 pandemic. In contrast, the growing danger of nuclear war is being largely ignored by the public and by most policymakers. In the 1980s, which seems as though it was a long time ago, the perceived threat posed by nuclear weapons was the subject of an unprecedented civil society mobilization, especially in my home country of Germany.

Just as the possibility of deadly disease outbreaks such as Ebola appeared to be an abstract and far-off danger, especially to people in Europe and other industrialized and wealthy nations, many today see nuclear weapons and the possible outbreak of nuclear war only as a theoretical danger that does not directly affect their daily lives. Unsurprisingly, little attention was paid to the 50th anniversary of the entry into force of the nuclear Nonproliferation Treaty (NPT) on March 5, 2020, the treaty that commits 191 states to achieve total disarmament and to prevent the further spread of nuclear weapons. Likewise, the news about the postponement of the NPT review conference announced at the end of March was largely ignored by the public.

Setbacks to Stability

Regarding the threats posed by nuclear weapons, such carelessness or complacency can no longer be afforded.

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To battle coronavirus disease, Iran converted the fairground of Iranmall, Tehran's largest shopping mall, into a hospital. The pandemic offers insight into the consequences of other global threats, such as climate change or nuclear war.
(Photo by Majid Saeedi/Getty Images)

The rapid change and fragmentation of international relations, return to great power politics, and reawakening of nationalism in key countries create the potential for conflict. The NPT is not just a matter for government experts and a small group of scientists. The intensifying rivalry among the United States, Russia, and China, which has resulted in a new qualitative nuclear arms race, can no more leave us indifferent than the nuclear weapons ambitions of individual countries in conflict-prone regions outside Europe.

Particularly since President Donald Trump took office, the United States has pushed ahead with its nuclear weapons program. It is no longer just a matter of modernizing existing systems, but also of developing and introducing new systems, especially of lower yields, in order to expand and render more flexible nuclear options in a regional context. Recent estimates suggest the cost of the U.S. nuclear weapons program could be a staggering $500 billion between 2018 and 2028.

Russia, not surprisingly, does everything in its power not to lag behind the United States. In recent years, President Vladimir Putin has pushed Russia to make significant efforts to develop new delivery systems for nuclear weapons. These range from a new heavy, land-based intercontinental ballistic missile to various hypersonic weapons systems to a nuclear-armed strategic torpedo and a cruise missile with intercontinental range. These developments were triggered by the Russian interest in evading U.S. missile defenses and ensuring a second-strike capability.

The two nuclear superpowers' push to further upgrade their already massive nuclear weapons capacities is liable to undermine strategic stability and lower the threshold for the use of nuclear weapons. The latter also applies in view of the fact that the United States and Russia in their doctrines assign an increased role to nuclear weapons and do not rule out the first use of these weapons in a regional conflict.

There have also been major setbacks recently regarding the nonproliferation of nuclear weapons, the second key objective of the NPT. North Korea's ongoing ballistic missile tests reaffirm its leadership's determination to expand its nuclear weapons capabilities while talks with the United States on denuclearization and peace remain stalled.

Perhaps of even more immediate concern for European security and the NPT is the crisis provoked by the unilateral U.S. withdrawal in 2018 from the Iran nuclear deal. When the agreement was concluded in 2015, it was clear to all Western parties that it would not resolve every problem posed by Iran,

The current administration has relied so far on national egotism in international relations and is trying to dodge any multilateral commitment and responsibility.

particularly its behavior in the Middle East. Rather, the aim was to subject Iran's nuclear activities to strict verification measures and to prevent Iran from being able to produce the necessary quantities of highly enriched uranium for nuclear weapons undetected within a short period of time.

The concrete gain in security achieved by the 2015 multilateral agreement has recklessly been called into question by the U.S. withdrawal. In addition, at least for the time being, the prospect of gradually building trust with Iran has been destroyed, trust that will be necessary to achieve viable solutions to other questions of stability in the Middle East. Instead, U.S. policy has strengthened the conservative and clerical forces in Iran who are opposed to domestic reforms and international engagement.

If the Trump administration tries in the coming months to reimpose UN nuclear sanctions on Iran that were waived when Iran implemented the 2015 deal, hard-liners in Tehran might feel encouraged to press for the pursuit of a nuclear weapons program and the withdrawal from the NPT. This would have fatal consequences for security in the Middle East and could trigger a domino effect. States such as Saudi Arabia could be forced to reconsider their renunciation of nuclear weapons.

Toward a Successful NPT

It would have been up to the 10th NPT review conference, which was to take place in New York from April 27 to May 22, to address these developments. It was generally expected that this conference would be very contentious because of stark differences between and among key groups of NPT states-parties, in particular the frustration of the non-nuclear-weapon states over the lack of progress in nuclear disarmament and the growing tensions between the United States and Russia and China. The postponement, however, frees up time to work toward a more productive review conference, but only if key states are prepared to meet several necessary prerequisites for success.

First, the U.S. leadership must be convinced that a successful conference is in their interest and that they can make a decisive contribution to that success through a constructive and results-oriented posture and a spirit of compromise. Unfortunately, the current administration has relied so far on national egotism in international relations and is trying to dodge any multilateral commitment and responsibility. Instead of dialogue and disarmament and arms control agreements, the Trump administration, as was often the case during the administration of President George W. Bush, relies on a unilateral, confrontational approach to conflict resolution and military superiority as a guarantee of security. Fueling the nuclear arms race through the modernization of its own nuclear arsenal, as well as the unilateral withdrawals from the nuclear agreement with Iran in 2018 and the Intermediate-Range Nuclear Forces (INF) Treaty with Russia in 2019, place high burdens and strains on the NPT review process.

In addition, by beginning a dialogue process on the conditions for nuclear disarmament, known as the Creating an Environment for Nuclear Disarmament initiative, the United States is clearly attempting to gain time and call into question the disarmament steps agreed by previous review conferences. The prospect of achieving a more constructive U.S. stance may be slim even if Trump is defeated in the November election by former Vice President Joe Biden and the NPT review conference is held after Inauguration Day on January 20. Nevertheless, despite its declining relative power in international relations, a more constructive U.S. role is key to the success of the NPT because the United States remains the pacesetter and linchpin for more effective global disarmament and nonproliferation policies.

Second, the contracting states must find new common ground and unity. The NPT remains an indispensable framework for nuclear disarmament, nonproliferation, and peaceful uses of nuclear energy. Nuclear- and non-nuclear-weapon states share an interest in effectively preventing the proliferation of nuclear weapons. In the absence of more effective and constructive leadership from Washington and given the Trump administration's erratic nonproliferation policy, it is important for a range of other relevant and influential states to pursue joint efforts to forge agreement on key NPT issues.

In addition, there is a need for constructive openness and painstaking management regarding the establishment of a Middle Eastern zone free of nuclear weapons and other weapons of mass destruction, which has always been a politically charged and particularly sensitive issue of crucial importance to NPT implementation. Unfortunately, divergent views on the approach and policies to be adopted toward that end, as well as growing divisions in the region, have made it more difficult than ever to achieve early results. Although there is agreement that such a zone cannot be imposed from outside the region, all states should support in a constructive spirit the pursuit of the process started with the first conference regarding the zone, which was held in New York in November 2019. In addition, they should urgently call for steps to be undertaken to build confidence in the Middle East. One such step could consist of the ratification of the Chemical Weapons Convention by

Egypt and Israel and the intensification of investigations into the persistent allegations of the use of chemical weapons in Syria.

Finally, the Treaty on the Prohibition of Nuclear Weapons, adopted by 122 states in 2017, has proven to be particularly divisive. This division of the international community must be overcome. The treaty expresses understandable frustration with the lack of progress in nuclear disarmament, but does not provide a basis for greater consensus at this time because it is rejected by all nuclear-weapon states and a number of important non-nuclear-weapon states. Furthermore, there are fundamental questions regarding its design, including ensuring a stringent verification regime, and its integration into the existing regime of disarmament and nonproliferation of nuclear weapons. Instead, it would be important to agree on an incremental approach consisting of meaningful concrete next steps on nuclear disarmament and nuclear risk reduction, which must not be too ambitious given currently unfavorable conditions. Germany has long been an advocate of the incremental approach, and within the so-called Stockholm Initiative, Germany and 15 other non-nuclear-weapon states from all continents agreed on a list of such steps at a ministerial meeting in February in Berlin. The credibility of the disarmament process hinges on the readiness in particular of the nuclear-weapon states to make a move forward in embracing and implementing such steps. For example, the start of negotiations on an internationally verifiable fissile material cut-off treaty could create long overdue momentum and help the NPT to get back on track.

Third, the United States and Russia must serve as role models and take the lead in nuclear disarmament. Together, the two countries have more than 90 percent of the world's nuclear weapons, more than 6,000 each. The Trump administration's insistence on China's involvement in any disarmament agreement has little or no chance of success in the near term given the still comparatively small Chinese arsenal of some 300 nuclear warheads. Instead, to underscore their commitment to nuclear disarmament, the United States and Russia should announce that they will extend the bilateral limitations set by the New Strategic Arms Reduction Treaty, which is due to expire in February 2021, and launch new bilateral talks designed to reach agreements on strategic stability and arms control, including numerical limitations of nuclear warheads and delivery systems, new weapons systems such as hypersonic missiles, conventional precision weapons, missile defense, and cyberthreats. This would be a signal of paramount political importance. Especially after the end of the INF Treaty, new restraint arrangements on the development and deployment of medium-range systems would be of major significance and constitute an important step toward rebuilding confidence between the two sides.

Fourth, the five nuclear-weapon states must jointly demonstrate their willingness to meet their NPT

President Donald Trump displays his order reinstating sanctions against Iran after announcing the U.S. withdrawal from the Iran nuclear deal on May 8, 2018. The move was one of several agreement withdrawals that have undermined strategic stability.
(Photo: Saul Loeb/AFP/Getty Images)

The coronavirus crisis was initially largely underestimated. Likewise, the danger of nuclear war is currently almost completely ignored.

disarmament obligations. Due to major differences, measures and possibly unilateral steps regarding the transparency about potentials and doctrines should be seriously considered. In addition, it is in the mutual security interests of the five NPT nuclear-armed states to agree to measures to reduce the risk of accidental or unauthorized use of nuclear weapons and to prevent an uncontrolled escalation. The so-called P5 process accompanying the review process could become the nucleus of a discussion and negotiation forum for the nuclear-weapon states on strategic stability, including geostrategic issues, new weapons, and threat perceptions, as well as regional stability and balance of power questions.

Fifth, the NPT review conference should not be overloaded. After the failure of the 2015 review conference to reach an agreed outcome and disappointments about the failure to fully implement commitments agreed at the conferences in 2000 and 2010, the first step must be to reaffirm the foundations of the international nuclear order as defined by the NPT.

The focus should be on the credible renewal of the "deal" on which the treaty is based: nuclear disarmament in exchange for nonproliferation and renunciation of nuclear weapons. This requires a clear political signal from the nuclear-weapon states that they remain committed to the goal of nuclear disarmament. In recent months, the five nuclear-weapon states have discussed the possibility of affirming a fundamental insight that U.S. President Ronald Reagan and Soviet leader Mikhail Gorbachev underscored at their summit in 1985: "A nuclear war cannot be won and must never be fought." At first glance, this seems to be simple and straightforward, enunciating what seems to be common sense. Yet, apparently not all nuclear-weapon states are willing to go along with such a reaffirmation, which sheds light on and is indicative of the current state of relations among them.

Takeaway Lessons

The coronavirus pandemic, which understandably is dominating the public debate, should reshape perceptions and responses to other transnational challenges. It provides lessons that need to be taken to heart and that should have an impact on the way in which nuclear disarmament and nonproliferation are addressed in the future.

The coronavirus crisis was initially largely underestimated. Likewise, the danger of nuclear war is currently almost completely ignored. The experience of the past few weeks should raise awareness not only of the danger of pandemics, but also of other global challenges that have so far been in the slipstream of attention. There should be room again for the insight that the danger of nuclear war, particularly in view of growing rivalries between the major powers, is not abstract but real and existential.

After the global coronavirus crisis has been overcome, it will be necessary to clarify what needs to be done to be better prepared in the future, to effectively prevent a pandemic outbreak and keep the effects under control. A passive, wait-and-see attitude according to the motto "everything will be fine" should now be discredited. Preventive security policy, disarmament, and arms control efforts, which must always be seen as "proactive conflict prevention," should become more of a focus.

It should be clear to all states, especially the United States, which has been among the worst hit by the virus, that national "go it alone" efforts are inappropriate and far less efficient. In a globalized world, global challenges can only be met effectively through cross-border, multilateral cooperation.

As of today, the medium- to long-term consequences of the coronavirus pandemic cannot be predicted in detail. Yet, it is already clear that immense financial expenditures will be necessary to remedy the economic damage caused. The question arises whether, in view of this, the nuclear powers still want to proceed with or can afford an expensive arms race or whether, as at the end of the Cold War, they want to take the path of containing great power competition through arms control and disarmament agreements.

It is by no means certain that a new window of opportunity for international cooperation and for nuclear disarmament and nonproliferation will follow from sober and rational reflection and new imperatives after the coronavirus crisis. Some might say that this is just a pious wish. Maybe it is more likely that once the pandemic is overcome, there will be a relapse into old and well-known behavioral patterns. Nevertheless, every effort should be made to use the crisis as an opportunity to create a new momentum for a successful NPT review conference.

The tough lessons of the pandemic for international relations are a wake-up call. Even if the prospects are poor, patience, perseverance, and persistence have always been a requirement of multilateral diplomacy. It was only toward the end of East-West confrontation that the arms control policy seeds sown in previous years of sustained and unwavering efforts could bear fruit. Germany, which was at the dividing line between East and West, has been fully aware of the importance of dialogue and cooperation for overcoming the Cold War. That is why it should not let up in its commitment to disarmament and arms control.

By Dominique Anelli

Old Chemical Weapons: Moving the OPCW to an Active Role

The global inventory of chemical weapons was once enormous, especially in the United States and Soviet Union, but today 98 percent of them have been destroyed. Most of this destruction took place after the Chemical Weapons Convention (CWC) took effect in 1997, and the treaty's implementation body, the Organisation for the Prohibition of Chemical Weapons (OPCW), has verified the elimination process.

As its verification-of-destruction role recedes, the OPCW has undertaken additional responsibilities that, for some, were not originally defined during the CWC's negotiation. For example, the OPCW has increased its counterproliferation efforts by annually inspecting about 240 industrial sites to ensure their peaceful nature. In 2018, a special session of the OPCW Conference of States Parties empowered the OPCW to investigate and identify the perpetrators, organizers, sponsors, or those otherwise involved whenever chemical weapons are used. The agency's Technical Secretariat is currently working to establish the basis for this investigation and identification team.

Another important task remains for the OPCW: to assist in the recovery and destruction of old chemical weapons worldwide that were buried on land or dumped in water. Such munitions represent a dual threat for the international community. Their chemical agents could still be used as weapons, and they could damage the environment by contaminating soil and water. Many CWC states-parties do not have the means to address such a massive task on their own. If no action is taken, however, centuries could pass before old chemical weapons would fully deteriorate.

By taking this action, the OPCW will move ever closer to achieving its ultimate objective: the eradication of an entire category of weapons of mass destruction.

The Scope of the Problem

For buried old chemical weapons, it is difficult to make an estimation of the remaining quantities. About 20 states-parties have declared stocks of old chemical weapons to the OPCW, and many have begun to destroy them. Old chemical weapons continue to be found regularly, but because of the destruction burden and the absence of international incentives, some countries have not declared their discoveries. It is known that buried old chemical weapons exist in China, Europe[1], Japan, and the United States and in some extraterritorial chemical weapon burial sites where they could be considered as abandoned chemical weapons.

As for munitions dumped at sea, one estimate assesses that 1.6 million tons of chemical munitions have been discarded at sea,[2] in European waters, for example.

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Old chemicals weapons await treatment in Belgium's destruction facility at Poelkappelle. (Photo: OPCW)

nations have dumped about 450,000 tons of a mix[3] of dumped chemical and conventional weapons, the most affected area being the Baltic Sea. In France, 250 tons of old chemical weapons are stored at the Suippes military facility in a northeastern region of the nation, and 10 to 20 metric tons of buried old chemical weapons are recovered annually, although these numbers can jump significantly when old munitions are discovered in the course of construction[4] or roadwork. The provisional pace of destruction at newly opened destruction facilities in France is about 20 tons per year, with capacity expected to double during the first 20 years, allowing for the destruction of the Suippes munitions depot. This means some known, existing buried stockpiles will remain untouched for the next two decades or more, representing a permanent threat and an environmental risk.

Fortunately, with respect to dumped munitions in France, numerous destruction facilities were constructed up until 1950 to destroy the chemical arsenal inherited from World War I. Yet despite those destruction sites, delays in destruction operations forced the French authorities to dump chemical weapons at sea. In 1921, 11,456 tons of chemical weapons were dumped 40 miles from Dunkirk. Around 1950, 250,000 grenades filled with mustard agent and about 800,000 conventional munitions, all from World War I, were dumped off the coast of Toulon.[5] After World War II, due to its political stance at this time, France did not actively participate in the massive dumping in European waters. Notwithstanding, chemical munitions from the Second World War were dumped by the Allies in North Gascogne, the Gulf of Gascogne, and off the coast of Saint Raphael, France.

Belgium has a smaller inventory of old chemical weapons and for the last 30 years has been able to destroy old munitions as they are recovered at its destruction facility at Poelkapelle. The historical recovery rate suggests, however, that destruction activity will continue for the next few centuries. Belgium has assisted other nations as well, destroying one old chemical weapon from the Netherlands in 2013, using an OPCW procedure that Austria employed in 2007.

With respect to dumped munitions, a technical assessment of Belgium's Paardenmarkt sandbank, in front of Knokke beach, was launched recently. After World War I, in the absence of any destruction facilities at that time, more than 15,000 tons of chemical weapons were dumped there in shallow waters. Should a decision be taken to recover these munitions, Belgium will require international support[6] to take on this challenge. In any case, substantial work will be needed to secure these dumped chemical weapons because they are near populated areas and in shallow waters.

Meanwhile, fishing vessels from Baltic nations regularly recover sea-dumped chemical munitions in their nets. Those old chemical weapons do not belong to the nations that recover them—the

Baltic countries never produced chemical weapons—but now they must store them or destroy them with little support from the international community. As a result, these discoveries are not reported to the OPCW.

Germany and the United Kingdom have officially declared their old chemical weapons stockpiles as destroyed, but they retain latent destruction capabilities from their earlier programs. Germany has assisted with the destruction of old chemical weapons recovered in Austria, after the OPCW determined that those munitions posed an imminent environmental danger.

Europe is not the only problematic region. The United States also has notable quantities of old chemical weapons. "Approximately 250 sites in 40 states, the District of Columbia, and three territories are known or suspected to have buried chemical warfare materiel," according to the U.S. Department of Defense.[3]

To tackle this challenge, the United States created the Recovered Chemical Materiel Directorate (RCMD) in 2012 under the umbrella of the U.S. Army Chemical Material Activity (CMA). The RCMD maintains a large resource of expertise and equipment to continue[4] the destruction of recovered old chemical weapons in full transparency with the OPCW. As for munitions dumped at sea, the Defense Department "believes it is best to leave the sea-disposed munitions in place unless there is an explosives emergency or serious threat to human health or the environment."[5]

Security and Environmental Risks

As old chemical weapons remain around the world, generally in known locations, some of them buried or dumped in shallow water could be easily accessible to malicious actors. The munitions would not function as originally designed, but they could nevertheless be used as a type of chemical dirty bomb that would cause serious psychological effects and mass disruption.

Such effects were evident, for example, following the 2018 chemical agent in Salisbury, UK. Everybody remembers the tremendous efforts deployed to isolate and decontaminate the potentially contaminated areas. If the Salisbury incident involved just a few grams of a chemical agent, imagine the devastating aftermath of a dirty chemical bomb containing 500 grams of mustard gas in an urban area. The cost of life might not be so high but the psychological and economic impacts would be serious.

One estimate assesses that 1.6 million tons of chemical munitions have been discarded at sea.

The risks to the environment may be more substantial. A program funded by the European Union called CHEMSEA has investigated the environmental impacts of chemical munitions dumped in the Baltic Sea, detecting at least one chemical agent in one-third of the sediment and sea life samples collected.[6] Those positive samples included chemical agents in cod and mussels that could make their way into kitchens around the world. Another study of sea-dumped chemical munitions developed a model that predicted that sunken chemical munitions containers will release their agents over the course of decades. Underwater shells containing

Numbers of reported incidents where chemical munitions have been caught by fishermen (HELCOM)

Year	Numbers of incidents	Weight of active gas in kg
2000	11	512
2001	11	514
2002	10	345
2003	25	1110
2004	4	160
2005	4	105
2006	1	6
2007	2	58
2008	1	0
2009	1	1.5
2010	3	65
2011	2	63
2012	1	45

Source: Helsinki Commission

The OPCW is uniquely qualified to launch and lead this ambitious objective.

mustard, for example, would begin to leak about 70 years after they were dumped and then continue for more than 250 years.[11]

The CHEMSEA program provides a snapshot of the current situation in the Baltic Sea, just one dumping ground and one where sea currents are not strong and waters are shallow. Despite its Baltics-focused research, it suggests there are much wider concerns when all dumping grounds are considered.

Tailored Solutions

This ticking time bomb cannot be ignored, but OPCW states-parties have been slow to act, discouraged by high costs and the lack of substantial international support. For many, all they can manage is compliance with existing CWC requirements, not additional activities. The OPCW should adopt a larger role in supporting efforts to identify, recover, declare, and destroy old chemical weapons.

Solutions exist, providing there is political willingness on the part of states-parties. With their support, the OPCW could serve as the catalyst for international awareness on this issue. To do this, the CWC would need to be updated and modified. Then, the OPCW would need to work in collaboration with other multilateral organizations involved with this issue. In addition, financial support would be required, and the private sector could be included. For example, Kanda Harbour (Japan) and Nord Stream (the Baltic Sea) have already proven their ability to find technical solutions to address the destruction of underwater munitions.

The OPCW is uniquely qualified to launch and lead this ambitious objective. As a first step, the states-parties need to establish the legal framework, from their decisions or CWC modifications, and increase their financial support[12] to the OPCW. The Technical Secretariat already possesses the necessary in-house human resources expertise and technical tools to enable implementation of the different tasks.

The organization has already shown its ability to take on and fund new tasks. In 2013, the international community was able to mobilize hundreds of millions of dollars for the destruction of chemical weapons in Syria. A OPCW-UN team was mandated to oversee the elimination of Syria's declared chemical weapons in the safest possible way and within a strict international time frame. Importantly, part of the plan adopted by states-parties and the UN Security Council called for disposing of the Syrian chemical agents outside the nation's borders, marking a groundbreaking development not contemplated in the treaty.

Investing in destroying old chemical weapons would be saving for the future. In Europe, some states-parties build and maintain old chemical weapons destruction sites at huge costs to destroy their own stockpiles. Others are not encouraged to declare their suspect discovered items because by declaring new discoveries, states-parties are obliged to host OPCW inspections[13] and to destroy any chemical munitions in dedicated facilities. A better way would be for the EU Working Party on Disarmament and Arms Control (CODUN) to coordinate the efforts by states-parties to encourage EU cooperation for the destruction of old chemical weapons. By doing so, the facility built by one member could serve other nations. In the future, CODUN could coordinate, finance, and delegate the service to the OPCW of one or more mobile destruction facilities. When necessary, such a mobile unit could be deployed worldwide to perform destruction activities under the leadership of the EU and the OPCW.

With this in mind, the time seems ripe for the OPCW, with the support of the International Dialogue on

OPCW inspectors have their equipment checked during a 2009 training session in the Czech Republic. The OPCW is uniquely qualified to support nations in their efforts to discover and destroy old chemical weapons. (Photo: OPCW)

Since the end of the First World War, at least 1.6 million tons of captured, damaged, obsolete, or unwanted chemical weapons agents and munitions have been dumped into the world's oceans. Source: The James Martin Center for Nonproliferation, 2017

Underwater Munitions, the Helsinki Commission (HELCOM), and the Oslo-Paris Convention to now take on the challenges of buried and sea-dumped old chemical weapons. With more than 20 years of experience verifying the destruction of chemical weapons, the OPCW could support and coordinate work on the destruction of buried old chemical weapons and launch investigations and recoveries of underwater dumped chemical munitions.

As a first step, states-parties would need to rethink the CWC. In pondering this question, it would be wise to remember that when the CWC was negotiated during the 1980s, stockpiles were huge.[14] At the time, two blocs were opposing each other's vision of the world order. The threats are different today; they are diffused, multidimensional, and changeable. The OPCW needs to adapt the treaty's content to face such new challenges. For example, at a time when chemical weapons destruction deadlines have largely passed, is it necessary to keep such obligations? For old chemical weapons, the treaty established two definitions: munitions produced before 1925 and those produced between 1925 and 1946 that have deteriorated to such extent that they can no longer be used as chemical weapons. In 2020, are such definitions still relevant? It would be preferable to adopt a single definition: chemical weapons produced before 1946. This would simplify the old chemical weapons declaration process and states-parties' destruction obligations.

Secondly, the OPCW needs to identify and engage with multilateral organizations in charge of buried or sea-dumped munitions. The United Nations has an important role to play and already has taken some steps. In December 2013, the UN General Assembly adopted a resolution titled "Cooperative measures to assess and increase awareness of environmental effects related to waste originating from chemical munitions dumped at sea."[15] Without creating any formal legal obligation to implement, the resolution called for studies and recommendations "for the purpose of promoting international cooperation in the economic…and health fields."[16] In addition, UN Secretary-General António Guterres established a special envoy for the ocean in 2017, appointing Peter Thomson of Fiji to the post.

Other needed institutions include the Convention for the Protection of the Marine Environment of the North-East Atlantic, which was opened for signature at the ministerial meeting of the Oslo and Paris Commissions in September 1992. It was adopted with a final declaration and an action plan. The convention entered into force on March 25, 1998.

At the regional level, there is the Barcelona Convention, which was adopted in 1976 to prevent and abate pollution in the Mediterranean Sea. Similarly, there is HELCOM,[17] an intergovernmental organization

that governs the Convention on the Protection of the Marine Environment of the Baltic Sea Area.

Despite their existence, none of organizations have the legal authority nor the necessary tools to compel OPCW states-parties to retrieve old chemical weapons. Until such time as that changes, nothing will be done to recover the thousands of tons of chemical weapons buried or dumped underwater.

In parallel with political, financial, and organizational endeavors, it will be necessary to address the technical challenges of destroying old chemical weapons, buried or submerged. The last 25 years of chemical weapons destruction demonstrate that unforeseen costs and technical difficulties are likely to emerge. For buried old chemical weapons, the real challenge is the transport of the munitions from the recovery site to the destruction facility. At times, some states-parties, such as the United States, have opted to deploy a mobile destruction unit close to the recovery site. In Europe, however, there is no such capacity; states-parties are obliged to carry out *in situ* destruction, sometimes beyond the scope of CWC obligations.[18] Some mobile destruction facilities financed by the EU and served by the OPCW would fill this capacity gap.

For underwater old chemical weapons, some innovative solutions have been used in Japan and the Baltic Sea. At Kanda Harbor in 2004, Japan found some dumped chemical munitions, which they declared to the OPCW. After scanning the bay and assessing the problem, authorities decided to place two mobile destruction facilities on a maritime platform. After underwater packaging, the munitions were treated in one of the two DAVINCH system detonation chambers.[19]

In 2011 the Nord Stream I project, the first part of a twin underwater gas pipeline through the Baltic Sea from Russia to Germany, needed to clear a seabed path for the pipeline and encountered dumped old chemical weapons. The submerged items, at depths of approximately 70 to 120 meters, were screened and then destroyed on-site when necessary.[20]

The dumped chemical munitions stockpile of the Paardenmarkt sandbank in Belgium could be used as a case study. It would offer the opportunity to put in place some funding and to develop all the political, organizational, and technical tools necessary to address internationally the problems of dumped chemical munitions. With states-parties' support, the OPCW could serve as the forum where such projects are discussed, approved, coordinated, and managed. At the end of 2013, when choosing four industrial sites[21] to destroy the Syrian chemical weapons, the OPCW clearly demonstrated its abilities to manage international destruction processes.

The fact that buried or sea-dumped old chemical weapons do not receive much notice in a world of problems competing for attention does not mean the security and environmental threats are any less. Without the leadership and support of an international organization, most individual nations do not have the financial means, the technical resources, or the incentive to take on such a challenge. Only through international cooperation can this worldwide peril be addressed.

ENDNOTES

1. Austria, Belgium, Italy, France, Germany, the Netherlands, Poland, Russia, Switzerland and the UK have declared recoveries and destruction of old chemical weapons.

2. Ian Wilkinson, "Chemical Weapon Munitions Dumped at Sea: An Interactive Map," September 7, 2017, https://www.nonproliferation.org/chemical-weapon-munitions-dumped-at-sea/.

3. Chemical weapons represent approximately 20 to 30 percent of this amount.

4. During construction of the railway line from Paris to Strasbourg over a four-year period, the number of old chemical weapons recovered annually increased.

5. Daniel Hubé, *Sur les traces d'un secret enfoui* (Paris: Michalon, 2016), pp. 222–223.

6. Pending political decisions to be taken by states-parties, and with EU financial support, the OPCW could serve as the catalyst for such destruction efforts with the financial support of the European Union.

7. National Research Council, *Remediation of Buried Chemical Warfare Materiel* (Washington: National Academies Press, 2012).

8. In the United States, recovered old chemical weapons are considered and treated as chemical weapons, and OPCW inspectors are invited to oversee the destruction.

9. Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, U.S. Department of Defense, "Research Related to Effect of Ocean Disposal of Munitions in U.S. Coastal Waters," December 2016.

10. A total of 180 sediment samples were taken during the campaign.

11. Wojciech Jurczak and Jacek Fabisiak, "Corrosion of Ammunition Dumped in the Baltic Sea," *Journal of KONBiN*, Vol. 41, No. 1 (2017): 227–246.

12. Should states-parties allow, the financial support provided for the destruction of chemical weapons from Syria could continue to be used for such purposes.

13. For buried old chemical weapons, the OPCW needs to move from a declaration mode to an assistance mode.

14. More than 70,000 tons of chemical weapons were declared to the OPCW after entry into force of the treaty.

15. UN General Assembly, A/RES/68/208, January 21, 2014.

16. UN Charter, arts. 13(1)(b), 13(2).https://undocs.org/en/A/RES/68/208https://undocs.org/en/A/RES/68/208

17. In 2014, the Helsinki Commission with the support of the EU released an important study on the assessment of chemical munitions dumped in the Baltic Sea. Chemical Munitions Search and Assessment Project, "CHEMSEA Findings: Results From the CHEMSEA Project," 2014.

18. When made aware of such difficulties, the OPCW Technical Secretariat tries to help states-parties to destroy the old chemical weapons, an overriding objective of the OPCW. In the absence of incentives by the OPCW, some states-parties do not declare their recoveries.

19. The DAVINCH system is a vacuum detonation chamber in which the munitions are destroyed by explosive donor charges. The chamber is followed by a waste treatment system to avoid any atmospheric pollution. The metallic parts are recovered and packed for further treatment, in case of arsenic content.

20. Nord Stream, "Nord Stream Preparing for Munitions Clearance," October 2, 2009, https://www.nord-stream.com/press-info/press-releases/nord-stream-preparing-for-munitions-clearance-366/.

21. Four sites were selected: Finland, Germany, the United Kingdom, and the United States.

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Danish F-16 fighter aircraft escort a Russian observation aircraft during a flight over Denmark in 20008. (Photo: OSCE)

U.S. to Withdraw From Open Skies Treaty

The United States officially notified its intent to withdraw from the 1992 Open Skies Treaty, prompting bipartisan opposition in Congress and expressions of regret from U.S. allies.

President Donald Trump justified the withdrawal decision on the grounds that Russia was violating the agreement, but he said, "There's a very good chance we'll make a new agreement or do something to put that agreement back together."

Secretary of State Mike Pompeo said in a May 21 statement that the withdrawal will take effect in six months. "We may, however, reconsider our withdrawal should Russia return to full compliance with the treaty," Pompeo added.

Pompeo cited Russian noncompliance with the accord as "making continued U.S. participation untenable." The United States asserts that Russia has violated the agreement by requiring that observation missions over Kaliningrad limit flight paths to 500 kilometers, establishing a 10-kilometer no-fly corridor along Russia's border with the Georgian border-conflict regions of South Ossetia and Abkhazia, and denying a requested overflight by the United States and Canada in September 2019.

Pompeo also alleged that "Moscow appears to use Open Skies imagery in support of an aggressive new Russian doctrine of targeting critical infrastructure in the United States and Europe with precision-guided conventional munitions."

Pressed to provide further information on this allegation on May 21, Christopher Ford, assistant secretary of state for international security and nonproliferation, said that he was "not at liberty to go into some of the details of why we think that this is a concern." He then added, "[W]hile not a violation per se, it's clearly something that is deeply corrosive to the cause of building confidence and trust."

Asked about what Russia would need to do in order to return to compliance with the treaty, Ford said, "I would say that that's a fact pattern we'll have to deal with when we encounter it."

The Defense Department said in a statement that "we will explore options to provide additional imagery products to Allies to mitigate any gaps that may result from this withdrawal."

The Russian Foreign Ministry criticized the U.S. exit from the agreement in a May 22 statement, calling it "a deplorable development for European security."

On the U.S. allegation that Russia is using the treaty to gather inappropriate intelligence, the statement said the "charge is being made by the party that insisted from the beginning on opening

the entire territory of the participating states (above all, naturally, the [Soviet Union] and later Russia) to observation flights."

The statement added that Russia's future participation in the treaty "will be based on its national security interests and in close cooperation with its allies and partners."

U.S. allies expressed varied responses to the U.S. exit from the treaty, but none of them signaled support for the move or indicated that they plan to follow the United States out of the agreement.

In a joint statement, 11 European countries (Belgium, Czech Republic, Finland, France, Germany, Italy, Luxemburg, Netherlands, Portugal, Spain, and Sweden) expressed "regret" over the U.S. decision.

"We will continue to implement the Open Skies Treaty, which has a clear added value for our conventional arms control architecture and cooperative security," they said. "We reaffirm that this treaty remains functioning and useful."

NATO Secretary-General Jens Stoltenberg urged Russia to return to compliance with the treaty after a May 22 meeting of the North Atlantic Council. He said that the United States withdrew in a manner "consistent with treaty provisions."

Poland said in a statement that efforts to return Russia to compliance "have proved unsuccessful."

German Foreign Minister Heiko Maas noted that Germany, along with France, Poland, and the United Kingdom, had previously told Washington that Russian noncompliance concerns did not justify a U.S. withdrawal from the agreement.

Sen. Jeanne Shaheen (D-N.H.), who sits on the Armed Services and Foreign Relations committees, called the Trump administration's move to withdraw from the Open Skies Treaty a "dangerous and misguided decision."
(Photo: Pete Marovich/Getty Images)

Prior to the U.S. decision to withdraw, the Trump administration consulted U.S. allies and other states-parties to the treaty, including by distributing a written questionnaire earlier this year. Throughout the process, allies expressed their support for continued U.S. participation in the treaty. (See *ACT*, January/February 2020.)

Several Democratic and Republican members of Congress excoriated the withdrawal decision and accused the administration of breaking the law.

"The dangerous and misguided decision to abandon this international agreement cripples our ability to conduct aerial surveillance of Russia, while allowing Russian reconnaissance flights over U.S. bases in Europe to continue," said Sen. Jeanne Shaheen (D-N.H.), who sits on the Armed Services and Foreign Relations committees.

House Foreign Affairs Committee Chairman Eliot Engel (D-N.Y.) first sounded the alarm about the Trump administration's plans to withdraw the United States from the treaty last October. (See *ACT*, November 2019.) Reacting to the withdrawal announcement, he said that "the president's reckless plan...directly harms our country's security and breaks the law in the process."

The fiscal year 2020 National Defense Authorization Act required that the Trump administration notify Congress 120 days before announcing an intent to withdraw from the Open Skies Treaty, which it failed to do. (See *ACT*, January/February 2020.)

Sen. Bob Menendez (D-N.J.), ranking member of the Foreign Relations Committee, said that he does "not accept the legitimacy of the administration's reckless decision."

House Armed Services Committee Chairman Adam Smith (D-Wash.) and Rep. Jim Cooper (D-Tenn.), chairman of the committee's strategic forces subcommittee, echoed the legal concerns and called the withdrawal "a slap in the face to our allies in Europe."

Rep. Don Bacon (R-Neb.), who represents Offutt Air Force Base, where America's OC-135B treaty aircraft are based, called the administration's decision a "mistake." He also urged that the administration adhere to the requirements in the defense authorization bill.

Meanwhile, Sen. Tom Cotton (R-Ark.), a longtime treaty critic, voiced support for the withdrawal. He said that he was "particularly heartened" that the United States would now not have to fund the replacement efforts for the two treaty aircraft.

Congress appropriated $41.5 million last year to continue replacement efforts for these aircraft, but Defense Secretary Mark Esper in March told Congress that he halted the funding until a decision on the future of the treaty was made. (See *ACT*, April 2020.)

Signed in 1992 and entering into force in 2002, the treaty permits each state-party to conduct short-notice, unarmed observation flights over the others' entire territories to collect data on military forces and activities. All imagery collected from overflights is then made available to any of the 34 states-parties.

Since 2002, there have been nearly 200 U.S. overflights of Russia and about 70 overflights conducted by Russia over the United States. Between 2002 and 2019, more than 1,500 flights took place.—*KINGSTON REIF and SHANNON BUGOS*

U.S., Russia to Meet on Arms Control

The United States and Russia have agreed to discuss nuclear arms control issues, according to U.S. President Donald Trump's arms control envoy following a May 8 phone call.

Marshall Billingslea, whom Trump also has nominated to serve as U.S. undersecretary of state for arms control and international security, said that Russian Deputy Foreign Minister Sergei Ryabkov agreed "to meet, talk about our respective concerns and objectives, and find a way forward to begin negotiations" on a new arms control agreement.

"So, we have settled on a venue, and we are working on an agenda based on the exchange of views that has taken place," he said.

Billingslea described the conversation during May 21 remarks at a Hudson Institute event in Washington, where he also criticized the 2010 New Strategic Arms Reduction Treaty (New START) and sketched out some of the Trump administration's goals for a new trilateral agreement with Russia and China.

New START expires in February 2021 unless Trump and Russian President Vladimir Putin agree to extend it by up to five years. Russia stated in December 2019 that it is ready to extend New START without any preconditions, but the Trump administration has yet to make a decision on the treaty's fate.

"Any potential extension of our existing obligations must be tied to progress towards a new era of arms control," Billingslea emphasized on May 21. Earlier, in a May 7 interview with *The Washington Times*, he also stated that the administration wants "to understand why the Russians are so desperate for extension, and we want the Russians to explain to us why this is in our interest to do it."

New START caps U.S. and Russian strategic nuclear arsenals at 1,550 deployed warheads and 700 deployed missiles and heavy bombers each. Under its monitoring and verification regime, the treaty allows for short notice, on-site inspections.

Billingslea views the agreement as flawed. "One main failing of New START, among the many problems with it, is that it does not include the Chinese," he told the newspaper.

Marshall Billingslea, shown speaking in Latvia in 2019, has been tapped to become undersecretary of state for arms control and international security. He outlined the Trump administration's plans at a May event at the Hudson Institute.
(Photo: Latvian State Chancellery)

Bringing China into nuclear talks would appear to be a challenging task, particularly as China has repeatedly stated that it wants no part in them. Most recently, a Chinese spokesperson told reporters on May 15 that Beijing "has no intention to take part in a trilateral arms control negotiation." Even Billingslea's State Department predecessor, Andrea Thompson, said on May 14 "that China's not going to come to the table before" New START expires next February. "There's no incentive for them to come to the table," she said, citing China's much smaller nuclear arsenal.

But Billingslea insisted that Beijing could be incentivized to negotiate.

"If China wants to be a great power, and we know it has that self-image, it needs to behave like one," he said May 21. "It should engage us bilaterally and trilaterally with the Russians."

Billingslea added that "Russia must help bring China to the negotiating table." Moscow previously said that it will not try to persuade China to change its position.

He further asserted that the United States would hold Russia to its "public commitments to multilateralizing the next treaty after New START." Moscow has long said that a future arms control agreement should include additional nuclear-armed states, including U.S. allies France and the United Kingdom.

A new agreement also must include Russia's large arsenal of nonstrategic nuclear weapons and stronger verification measures than those contained in New START, Billingslea argued.

Billingslea did not say what the United States might be prepared to put on the table in return for limits on additional Russian weapons or concessions from China, nor did he clarify what precisely the administration is seeking from China on arms control.

Russia has frequently raised missile defense as an issue that must be on the table in the next round of arms control talks, but the special envoy said that he did not foresee the United States agreeing to limitations on missile defense.

Billingslea claimed that the United States is in a strong negotiating position and could win a new arms race if necessary.

"We know how to win these races, and we know how to spend the adversary into oblivion," he said. "If we have to, we will, but we sure would like to avoid it."

Russia criticized Billingslea's May 7 interview with *The Washington Times*.

"The unmistakable impression" is that Billingslea "has not been brought up to speed on his new job," Russian Foreign Ministry spokeswoman Maria Zakharova said on May 14.

She also noted that the Trump administration's desire to include China in arms control talks was "far-fetched."

Trump and Putin discussed arms control on a May 7 phone call.

"President Trump reaffirmed that the United States is committed to effective arms control that includes not only Russia, but also China, and looks forward to future discussions to avoid a costly arms race," said the White House in a statement following the call. The statement made no mention of New START.

The Kremlin said in a statement that the two presidents agreed to work to resolve "the urgent problems of our time, including maintaining strategic stability."

The United States and Russia last held formal talks on strategic security in January. (See *ACT*, March 2020.)

Meanwhile, U.S. Ambassador to Russia John Sullivan said on May 5 that Trump had agreed to Russia's January proposal that the heads of state of the five permanent members of the UN Security Council (China, France, Russia, the UK, and the United States) hold a summit to discuss a broad range of security topics, including arms control.

"It's my understanding that the substance and logistics of such a meeting are under consideration," said Sullivan.

On April 27, Russian Foreign Minister Sergei Lavrov stated that all parties agreed that the summit "must be face to face." He added two days later that "the conceptual content" of the summit is in the works.

"There is agreement, an understanding," Lavrov said, "that it should be devoted to all the key problems of the modern world, strategic stability, and global security in all its dimensions."

In Washington, Billingslea could be facing a controversial Senate confirmation process before he can officially assume the position to which Trump named him on May 1. Some senators are likely to question his reputation as a critic of arms control and to examine his human rights record. The Senate Foreign Relations Committee has not yet scheduled a confirmation hearing.

Billingslea previously served as assistant secretary for terrorist financing at the Treasury Department. He was an adviser to Sen. Jesse Helms (R-N.C.), an ardent opponent of arms control who opposed U.S. ratification of the 1993 Chemical Weapons Convention and the 1996 Comprehensive Test Ban Treaty.

In 2019, Trump nominated Billingslea for the top human rights post at the State Department, but his nomination stalled in early 2020 amid concerns about his role in promoting enhanced interrogation techniques that Congress later banned as torture while serving in the Pentagon from 2002 to 2003 during the George W. Bush administration. *—KINGSTON REIF and SHANNON BUGOS*

Trump Officials Consider Nuclear Testing

Senior Trump administration officials recently discussed the possibility of resuming explosive nuclear testing, a practice the United States last undertook in 1992. *The Washington Post* reported on May 22. No nuclear-armed nation has conducted a nuclear test explosion since 1998 except North Korea, and U.S. resumption would threaten to raise already increasing tensions with China, Russia, and others.

The recent consideration was taken up by a group of national security officials on May 15, but the participants reportedly did not reach a decision. The idea is "very much an ongoing conversation," one person familiar with the national security meeting told the *Post*.

Despite the interest of some officials, others argued against the idea. "There are still some professionals in the room who told them this is a terrible idea, thank God," a congressional aide told *The Guardian*. Defense Department official Drew Walter later said there "has been no policy change" regarding explosive nuclear testing, *Defense News* reported.

The justification for resuming testing would not be a technical one having to do with a design flaw in one of the existing types of warhead, but would be political. According to the *Post*, a senior official said that demonstrating that the United States could "rapid test" could prove useful from a negotiating standpoint as the Trump administration pushes for a new, trilateral arms control deal with Russia and China.

Such a test could take only months to prepare, Walter said. "Ultimately, if the president directed because of a technical issue or a geopolitical issue, a system to go test, I think it would happen relatively rapidly."

The Nevada National Test Site was the location of 928 nuclear weapon detonations before the United States began its testing moratorium in 1992. (Photo: Sydney Martinez/Travel Nevada)

At the May 15 meeting, the officials "discussed underground testing in the context of trying to bring China to the table for the trilateral agreement," a former official said to *The Guardian*. "Among the professionals in the administration, the idea was dismissed as unworkable and dumb," while the National Nuclear Security Administration (NNSA) was "definitely not on board" and the State Department likely was not in agreement either, the former official said.

Part of the discussion reportedly focused on the administration's assessment that China and Russia may have conducted nuclear weapons activities that are inconsistent with the zero-yield standard established by the 1996 Comprehensive Test Ban Treaty (CTBT), which prohibits nuclear experiments that produce an explosive yield. The treaty is not in force, as eight specific countries, including the United States and China, have not ratified the pact.

The State Department made its allegations in its most recent annual report assessing nations' compliance with arms control agreements. The report says some Russian activities since 1996 "have demonstrated a failure to adhere to the U.S. 'zero-yield' standard, which would prohibit supercritical tests." The report added that "the United States does not know how many, if any, supercritical or self-sustaining nuclear experiments Russia conducted in 2019." (See *ACT*, May 2020.)

According to the U.S. nuclear test readiness guidelines, a "simple test" with limited instrumentation could be conducted by the NNSA, a semiautonomous agency in the Energy Department, at the former Nevada Test Site within six to 10 months once the president decides to resume nuclear testing.

News of the renewed testing consideration drew widespread condemnation. "I burst into tears when I read that," said Mary Dickson, a longtime activist for Americans who suffer health problems from decades of U.S. testing in the atmosphere. "I live every day with watching the effects that testing all those years ago had on so many people I know and love. We're still living with the consequences of fallout from testing. ... Their cancers are coming back. They are more at risk during the pandemic. But we think of doing it again," she told *The Salt Lake Tribune* on May 26.

China was quick to respond to the report. "We're gravely concerned about the report," said Chinese Foreign Ministry spokesperson Zhao Lijian at a Beijing press conference on May 25. "Though [the CTBT] has not yet entered into force, banning nuclear testing has become an international norm. The CTBT is of great significance for nuclear disarmament, nonproliferation and world peace and security. All five nuclear-weapon states, including the U.S., have signed the treaty and committed to a moratorium on nuclear tests."

The administration's openness to testing raises concern that Washington will move to "unsign" the CTBT, a pact the United States was first to sign in 1996 but the Senate has never approved. The United States has nevertheless adhered to a moratorium on testing and is the leading financial contributor to the Comprehensive Test Ban Treaty Organization, which maintains and operates the worldwide monitoring system to verify compliance with the treaty.

The Trump administration has already worked repeatedly to pull the United States out of arms control commitments. Secretary of State Mike Pompeo, for example, announced May 21 that Washington would withdraw from the Open Skies Treaty in six months time. Previously, the administration withdrew the United States from the 1987 Intermediate-Range Nuclear Forces Treaty that banned an entire class of missiles, and it also stepped away from the 2015 Iran nuclear deal. In addition, it has "unsigned" the Arms Trade Treaty, another pact that the United States had signed but not ratified. —*GREG WEBB*

U.S. Aims to Extend Iran Embargo

The Trump administration is considering a range of options to prevent the October 2020 expiration of a UN embargo that restricts arms sales to and from Iran. If multilateral efforts to renew the embargo fail, the administration will likely attempt to argue that the United States remains a participant of the 2015 Iran nuclear deal so that Washington can exercise a Security Council provision to block the embargo's expiration.

The embargo's expiration date is included in Resolution 2231, which endorses and helps implement the 2015 nuclear deal, formally called the Joint Comprehensive Plan of Action (JCPOA). Under a resolution provision, listed participants of the nuclear deal are granted the ability to invoke a sweeping "snapback" of all UN restrictions that were lifted or would be lifted by the agreement, including the embargo. The United States formally abrogated the

Iranian President Hassan Rouhani addresses the UN General Assembly on Sept. 25, 2018. He has vowed a "crushing response" if the arms embargo on Iran is extended.
(Photo: Spencer Platt/Getty Images)

JCPOA in May 2018, but Resolution 2231 was never amended to reflect the U.S. withdrawal and still names the United States as among the JCPOA participants that have the right to invoke the snapback mechanism.

Reinstating sanctions and restrictions through Resolution 2231 would extend the embargo indefinitely. Doing so, by also reimposing all other UN sanctions and restrictions on Iran, would likely collapse the JCPOA and tie the hands of a future U.S. president seeking to return to the multilateral nuclear deal. Iranian President Hassan Rouhani said on May 6 that "Iran would never accept the extension of an arms embargo" and warned that "Iran will give a crushing response if the arms embargo on Tehran is extended."

Earlier this year, Iranian Foreign Minister Javad Zarif also threatened that Iran would withdraw from the nuclear Nonproliferation Treaty altogether if referred to the Security Council over its nuclear program and faced with the reimposition of UN sanctions. (See *ACT*, March 2020.)

Whispers of the Trump administration's plan to claim participation in the deal in order to exercise the snapback mechanism began in late 2019, when an internal legal memo that circulated within the State Department reportedly detailed "a legally available argument we can assert that the United States can initiate the snapback process" under Resolution 2231.

Washington "will exercise all diplomatic options" to extend the embargo, said U.S. Secretary of State Mike Pompeo on May 9, after receiving a congressional letter urging the administration to pursue diplomatic measures to prevent the embargo's expiration. More than three-quarters of the members of the U.S. House of Representatives signed the May 4 bipartisan letter co-sponsored by Foreign Affairs Committee Chairman Eliot Engel (D-N.Y.) and Rep. Michael McCaul (R-Texas), the committee's ranking member. The House letter does not mention the JCPOA or the Resolution 2231 snapback process, but according to a May 4 statement by Engel, "[T]his letter, supported overwhelmingly by both parties in the House, represents an imperative to reauthorize this provision—not through snapback or going it alone, but through a careful diplomatic campaign."

The administration has indicated it will pursue a standalone Security Council resolution establishing a new arms embargo on Iran first, but that measure will almost certainly be vetoed by one of

United States Ends Sanctions Waivers

The Trump administration has announced it will terminate some key sanctions waivers that had allowed other nations to cooperate on certain projects with Iran outlined in the 2015 nuclear deal.

Companies working on modifications to Iran's heavy water reactor at Arak have 60 days to wind down activities or face U.S. sanctions, according to a May 27 statement from Secretary of State Mike Pompeo. The waiver allowing Iran to import uranium enriched to 20 percent for its Tehran Research Reactor and to transfer out spent fuel was also terminated.

The United States had been issuing sanctions waivers allowing these projects to continue since U.S. President Donald Trump withdrew from the nuclear deal, known as the Joint Comprehensive Plan of Action (JCPOA), and reimposed sanctions on Iran in May 2018.

Under the terms of the nuclear deal, Iran is required to modify the unfinished reactor at Arak so that when operational it would produce annually far less plutonium than is necessary for a nuclear weapon. If the reactor were finished based on the original design, it would have produced enough plutonium for about two nuclear weapons per year.

Iran said in 2019 it would revert back to the original design of the reactor if cooperative efforts, which primarily include China and the United Kingdom, cease. The agreement allows Iran to import uranium enriched to 20 percent to fuel its Tehran Research Reactor and requires Iran to ship out the spent fuel. The parties to the agreement are required to assist Iran in obtaining the necessary fuel. Iran is also prohibited from enriching uranium to more than 3.67 percent uranium-235 for 15 years under the nuclear deal.

In past statements announcing the renewal of waivers for these sanctions, Pompeo has highlighted the nonproliferation benefits of the cooperative projects. In October, Pompeo said the United States was issuing the waivers because the projects "help preserve oversight of Iran's civil nuclear program, reduce proliferation risks," and "prevent the regime from reconstituting sites for proliferation-sensitive purposes."

In the May 27 announcement, Pompeo said that Iran has "continued its nuclear brinkmanship by expanding proliferation sensitive activities" so he "cannot justify renewing the waiver for these JCPOA-related activities."

It is unclear what activities Pompeo is referring to. While Iran has taken steps to violate the nuclear deal in response to Trump's reimposition of sanctions, Tehran has not announced any new actions to reduce compliance with the accord since the United States last renewed the waivers March 30.

Pompeo said the Trump administration would extend for another 90 days the waiver allowing cooperative activities at the Bushehr power reactor to "ensure safety of operations." The Bushehr reactor was operational prior to the JCPOA's implementation.

Waivers for several other cooperative projects were terminated in 2019.—*KELSEY DAVENPORT*

the other four JCPOA participants who have permanent membership and veto power on the UN Security Council.

In that case, the United States has hinted its intent to invoke the snapback provision in Resolution 2231, which cannot be vetoed. The State Department's special representative for Iran, Brian Hook, confirmed in a May 13 opinion piece for *The Wall Street Journal* that the administration drafted a standalone Security Council resolution to extend the embargo and is hoping it will pass, but said that "if American diplomacy is frustrated by a veto, however, the U.S. retains the right to renew the arms embargo by other means."

The United States has not yet formally introduced its draft of a standalone resolution to the Security Council. The Trump administration reportedly shared sections of that draft with European members of the nuclear deal in February 2020.

According to Hook, "[T]he Trump administration's preferred strategy is for the Security Council to extend the arms embargo while the U.S. continues to apply maximum economic pressure and maintains deterrence against Iranian aggression." But, he said, if the United Nations "doesn't renew the arms embargo against Iran, the U.S. will use its authority to do so."

It is not clear whether the Trump administration's move to reinstate sanctions through Resolution 2231 would succeed. Should the United States attempt to exercise the snapback mechanism and unilaterally block the expiration of the arms embargo, it is highly likely that the remaining parties to the nuclear deal (China, France, Germany, Russia, the United Kingdom, and the EU) will strive to delegitimize the U.S. legal argument in order to preserve the JCPOA.

Although the Europeans appear to share Washington's concerns about Iran's arms trade, they have made clear they do not support steps to extend the embargo that could lead to the JCPOA's collapse. EU Foreign Policy Chief Josep Borrell said on April 30 that Europe does not consider the United States a participating member of the 2015 nuclear deal. A second European official said the same day that France, Germany, and the UK would not condone extending the embargo through the Resolution 2231 snapback clause because "the arms embargo is a legitimate part of the JCPOA."

Vassily Nebenzia, Russian ambassador to the UN, said on May 12 that the United States "has lost any right" to snapback UN restrictions under Resolution 2231. China's UN mission bluntly tweeted on May 14 that the United States "failed to meet its obligations under Resolution 2231 by withdrawing" from the JCPOA and that "it has no right to extend an arms embargo on Iran, let alone to trigger snapback." Together, statements from Russia and China make clear that Moscow and Beijing will counter any U.S. efforts to extend the embargo through a standalone resolution or through invocation of the snapback mechanism.

The Trump administration appears determined to prevent the expiration of the UN embargo, but if the United States fails to do so, many key restrictions governing arms sales to and from Iran will remain in place. Iranian arms sales to nonstate actors in Yemen and Lebanon will continue to be subject to U.S. and UN restrictions, even if the embargo expires as scheduled in October 2020. —*JULIA MASTERSON*

IAEA Nuclear Oversight Grew in 2019

The International Atomic Energy Agency (IAEA) monitored a growing amount of nuclear material in 2019, but persistent security and political challenges prevented the agency from understanding the full scope of nuclear activities in some nations. The agency circulated its annual report of its safeguards activity in April, disclosing that its personnel conducted 2,179 inspections in 183 states in 2019. It now oversees over 8 percent more nuclear material than the previous year. Overall, the material would be enough for more than 216,400 nuclear weapons, which the agency calls "significant quantities."

The annual safeguards implementation report reflects the global scale of the IAEA's role in ensuring that nuclear materials in peaceful facilities are not diverted to military uses. It summarizes the agency's activities to implement safeguards across member states and its conclusion about the status of nuclear materials in states where safeguards are conducted. The agency has given the report only to its member states. A copy of the document was provided to *Arms Control Today*.

The report also highlights difficulties in meeting those safeguards goals. In the case of Libya, for example, the IAEA was no longer able to confirm that there was "no indication of undeclared nuclear material or activities" or any diversion of nuclear material. According to the report, the IAEA cannot

IAEA Director-General Rafael Mariano Grossi (left) tours the agency's Nuclear Material Laboratory in January. The lab is one of the tools the agency uses to monitor nuclear activities around the world. (Photo: Dean Calma/IAEA)

verify "the actual status of nuclear material previously declared by Libya" at a particular location. It is likely that the country's unstable security situation has made it difficult for IAEA inspectors to conduct their routine work.

The report also highlighted difficulties in understanding all nuclear activities in North Korea and Syria. The agency has not conducted any on-site inspections in North Korea since April 2009, when IAEA inspectors were asked to leave. But the agency intensified its efforts in 2019 to enhance agency readiness "to play its essential role in verifying" the country's nuclear program once a political agreement is reached, according to the report.

The report concluded that there were "no indications of the operation" in 2019 of North Korea's five-megawatts electric reactor, which produces plutonium for nuclear weapons, or at a facility that separates plutonium from the reactor's spent fuel. But there have been "indications consistent with the use of the reported centrifuge enrichment facility."

In Syria, IAEA inspectors visited the nation's Miniature Neutron Source Reactor, which contains less than one kilogram of weapons-grade uranium, and another site in Damascus in 2019, but the agency continues to press Syria to cooperate with the agency's investigation into a building destroyed in 2008 that "was very likely" a nuclear reactor that Syria failed to declare to the IAEA.

The nuclear Nonproliferation Treaty (NPT) requires its states-parties to implement a safeguards agreement with the IAEA to ensure that nuclear activities are peaceful. The safeguards agreements are to be negotiated within 180 days of ratifying the treaty, but the 2019 report noted that 10 states have not yet completed safeguards agreements with the IAEA.

Since 1997, IAEA member states have had the option to implement a more intrusive additional protocol to their safeguards agreement, which gives inspectors more information about a country's nuclear program, expands access to sites, and allows for shorter-notice inspections. Of the 183 NPT states with safeguards agreements, 131 also implemented an additional protocol in 2019, an increase from the 129 states with additional protocols in 2018.

The IAEA concluded that, in 69 of the 131 states, "all nuclear material remained in peaceful activities" and that there was "no indication of undeclared nuclear material or activities" or any diversion of nuclear material. Libya was the only country that was included in that list for 2018, but not 2019.

For 62 of those states that implement a safeguards agreement and an additional protocol, the IAEA determined that "declared nuclear material remained in peaceful purposes" in 2019 but that "evaluations regarding the absence of undeclared nuclear material and activities" remain ongoing. Iran is one of the 62 countries.

The IAEA noted that some states that have negotiated additional protocols have yet to provide the agency with all of the required information under the agreement and that some states restricted access to inspectors, but that progress is being made in providing more timely information.

IAEA Iran Inspections Increased in 2019

The International Atomic Energy Agency (IAEA) conducted more inspections in Iran in 2019 than the prior year, according to an annual report on the agency's application of safeguards.

The IAEA's annual safeguards implementation report noted that Iran received 432 inspections during 2019, an increase from 385 the previous year. The IAEA also conducted 33 complementary access visits in Iran in 2019, according to the report, which accounted for about 20 percent of 149 total complementary access inspections conducted in 183 states throughout the year.

Complementary access provisions allow inspectors to visit sites on short notice and are included in an additional protocol to a state's safeguards agreement that many have adopted. In addition to allowing complementary access inspections, the additional protocol provides the agency with expanded access to sites and information about a country's nuclear program.

Iran is provisionally implementing the additional protocol to its safeguards agreement as part of the 2015 multilateral nuclear deal, known as the Joint Comprehensive Plan of Action (JCPOA).

The IAEA concluded that Iran, along with 61 other states implementing safeguards agreements and additional protocols, had not diverted any nuclear materials from peaceful activities during 2019, but stated that "evaluations regarding the absence of undeclared nuclear materials and activities" remain ongoing.

The IAEA has used similar language to describe Iran's nuclear program in its quarterly reports on the country's implementation of the JCPOA.

Kazzem Gharibabdi, Iran's ambassador to the IAEA, said on May 6 that the report highlights Tehran's cooperation with the agency. But he warned that cooperation is "not the only option" available to Iran, and the country may revise its safeguards commitments in light of Iran not receiving sanctions relief envisioned by the JCPOA after U.S. President Donald Trump withdrew from the deal and reimposed sanctions.

Iran has not complied with all agency requests to visit undeclared facilities, according to a February report on Iran by the IAEA. The safeguards implementation report did not provide any details on the agency's outstanding access requests.

The report also noted that the IAEA Iran team comprised of 269 inspectors in 2019, down slightly from 276 the previous year, and spent 20.4 million euros implementing Iran's safeguards and JCPOA-related monitoring provisions.—*KELSEY DAVENPORT*

The safeguards report also said that three states did not allow inspectors to access certain areas within declared facilities, only one of those cases was resolved in 2019, and five states did not provide "timely access" for inspectors. The report did not specify the states.

Forty-four states are implementing safeguards but not additional protocols. The IAEA noted that, for these states, "declared nuclear material remained in peaceful activities" and conducted 146 inspections at sites in these countries.

States that are not party to the NPT can also conclude safeguards agreements with the IAEA. India, Israel, and Pakistan have all negotiated safeguards agreements for specific locations.

The IAEA conducted 93 inspections at locations under safeguards in those three countries in 2019, a slight increase from the 78 inspections the prior year. The agency also recorded an increase in the nuclear materials under safeguards in those countries, from 3,938 kilograms in 2018 to 4,260 kilograms in 2019.

The IAEA also conducts safeguards inspections in the five nuclear-weapon states (China, France, Russia, the United Kingdom, and the United States), which are not required to implement safeguards under the NPT. All five, however, have negotiated what are called "voluntary offer" safeguards and additional protocols with the IAEA, which covers more than 35,000 significant quantities of nonmilitary nuclear materials and facilities. The agency conducted 79 inspections at sites in the five nuclear-weapon states in 2019.

In addition, the report contains information about IAEA efforts to address new technical challenges. According to the report, the IAEA continued to work on safeguards applications for new types of facilities, including small modular reactors and geological repositories for spent fuel. One of the new technologies successfully tested in 2019 is an unattended monitoring system for cylinders of uranium gas at enrichment facilities.

The report also documents IAEA sampling and deployment of technologies used for conducting safeguards inspections. According to the report, the IAEA collected 442 uranium samples, 40 plutonium samples, and 405 environmental samples in 2019. The report noted that the total installation of surveillance cameras was 1,425 by the end of 2019, including new underwater cameras for spent fuel ponds, and that inspectors tested new software for reviewing data collected by IAEA surveillance systems. —***KELSEY DAVENPORT***

U.S. Continues Intermediate-Range Missile Pursuit

The U.S. Defense Department is moving forward with plans to acquire conventional ground-launched missiles that fly distances previously banned by the 1987 Intermediate-Range Nuclear Forces (INF) Treaty. The progress follows two demonstration tests of such missiles last year, but the next steps in the development process and how much the Pentagon plans to spend on the missiles is unclear. Whether U.S. allies and partners will agree to host the missiles once they are built also remains to be seen.

The two 2019 tests included a prototype ground-launched ballistic missile last December (see *ACT*, January/February 2020) and a ground-launched variant of the Navy's Tomahawk sea-launched cruise missile in August, just two weeks after the United States formally withdrew from the INF Treaty. (See *ACT*, September 2019.)

The treaty required the United States and Russia to eliminate permanently all their nuclear and conventional ground-launched ballistic and cruise missiles with ranges of 500 to 5,500 kilometers. Since 2014, the United States has accused Russia of violating the agreement by producing and fielding an illegal ground-launched cruise missile.

The USS Annapolis submarine test launches a Tomahawk Land Attack Missile off the coast of California in 2018. The Trump administration is proposing to acquire Tomahawks to launch from land which would have previously been banned by INF Treaty. (Photo: U.S. Navy)

The fiscal year 2021 budget request released in February includes $125 million for the Marine Corps to purchase 48 Tomahawk missiles. The budget documents did not include further information about the purchase or whether the Marine Corps planned to buy additional missiles in future years.

Gen. David Berger, the commandant of the Marine Corps, told the Senate Armed Services Committee on March 3 that the U.S. withdrawal from the INF Treaty allows the naval branch to assess the feasibility and utility of firing the Tomahawk missile from a ground launcher. The missile has an estimated range of between 1,250 and 2,500 kilometers.

Berger suggested the missile could be used to "contribute to sea control and sea denial," but other Marine Corps officials have said the missile would be evaluated for attacking targets on land.

A February report by the Congressional Budget Office questioned whether the Tomahawk missile would be a suitable candidate for a new ground-launched system.

The "Tomahawk land-attack cruise missile, a relatively slow missile with no low-observable features, has become less effective at penetrating defended airspace," the report stated.

Lt. Gen. Eric Smith, Marine Corps deputy commandant for combat development and integration, provided lawmakers with some additional details about the Marine Corps plans for longer-range, ground-launch systems at a March 11 congressional hearing.

The Marine Corps will work with the Pentagon's Strategic Capabilities Office "to continue design and development of a mobile launch platform in order to prototype and field a Marine Corps ground-based, long-range, land attack cruise missile capability for employment by its rocket artillery units," he said. "Prototype launchers will undergo firing and endurance testing through fiscal year 2022, with the aim of fielding a battery of launchers to an operational unit in fiscal year 2023."

Smith did not say how much the Marine Corps is requesting in fiscal year 2021 and beyond for the launch platform. A Defense Department spokesman told *Arms Control Today* in February that money appropriated in fiscal year 2020 "will complete the maturation of a conceptual cruise missile launcher."

The Pentagon requested $96 million in its fiscal year 2020 budget to develop three types of ground-launched, intermediate-range missiles. (See *ACT*, May 2019.) These included a ground-launched cruise missile and two types of ballistic missiles. The final fiscal year 2020 defense appropriations bill approved by Congress in December provided $40 million less than the request. (See *ACT*, January/February 2020.)

The Defense Department has provided far less information about the status of its plans for developing a ground-launched ballistic missile capability.

Department officials told reporters in March 2019 that the department was seeking a ground-launched ballistic missile with a range of 3,000 to 4,000 kilometers. (See *ACT*, April 2019.) The officials estimated that the new missile would not be ready for at least five years.

Commandant of the Marine Corps Gen. David Berger testifies before the Senate Armed Services Committee in December 2019. He later told the committee that the United States can now assess ground-launched cruise missiles once banned by the INF Treaty.
(Photo: Chip Somodevilla/Getty Images)

The Pentagon is not requesting new funding for either of the ballistic missile line items Congress funded in fiscal year 2020.

One possible candidate for the weapon is the Army's Precision Strike Missile, which the service is developing to replace the aging Tactical Missile System and "attack critical and time sensitive area and point targets."

The range requirement for the missile is up to 499 kilometers, but that was dictated by the INF Treaty. Army officials have stated the missile could eventually fly as far as 700 kilometers. That range, however, would be far shorter than the 3,000 to 4,000 kilometers department officials previously identified as the goal for a new intermediate-range ballistic missile.

The Army is requesting $123 million for the Precision Strike Missile in fiscal year 2021. The service aims to begin fielding the missile as soon as 2023.

Other ground-launched weapons being pursued by the Army with ranges slated to exceed 500 kilometers include the long-range hypersonic weapon and the strategic long-range cannon. The budget request seeks $801 million for the hypersonic weapon, a massive increase of nearly $400 million above the fiscal year 2020 appropriated level, and $65 million for the cannon program.

The Army's budget request does not include funding to continue development of a mobile, land-based, medium-range missile, citing an "Army realignment of funds to higher priority programs." The fiscal year 2020 budget request contained $20 million in initial funding for the program, but Congress only provided $5 million.

The Pentagon's request to develop missiles formerly prohibited by the INF Treaty was a controversial issue in Congress last year.

The final version of the fiscal year 2020 defense authorization bill prohibited the use of current-year funds to procure and deploy missiles formerly banned by the INF Treaty, but does not prohibit their development and testing, as the House of Representatives' version of the bill had initially proposed. The bill also required the Pentagon to report on the results of an analysis of alternatives that assesses the benefits and risks of such missiles, options for basing them in Europe or the Indo-Pacific region, and whether deploying such missile systems on the territory of a NATO ally would require a consensus decision by NATO.

Basing new ground-launched missiles in Europe and East Asia is likely to prove challenging. Despite their concerns about Russia and China, U.S. allies have not appeared eager to host the missiles.

A senior Defense Department official told reporters on Feb. 21 that the administration has not "actually spoken to the allies about basing" such missiles "on their territory, at this time."—*KINGSTON REIF*

U.S. Arms Deals Continue During Pandemic

As the Trump administration designated the defense industry as essential, notifications of potential new international arms sales have continued during the coronavirus pandemic. In May, however, the firing of the State Department's inspector general and push for new arms sales raised controversy.

The most high-profile concerns, however, focus on a deal that has not yet been formally notified to Congress for new weapons for Saudi Arabia. In a May 27 CNN commentary, ranking Senate Foreign Relations Committee member Bob Menendez (D-N.J.) said he had not received sufficient answers as to why the deal, details of which were not yet public, was needed and that, "Until we have an answer, Congress must reject this new multi-million dollar sale of weapons to Saudi Arabia." The following day, *The New York Times* reported that the deal valued at $478 million would include 7,500 precision-guided missiles and licenses to allow Raytheon to expand manufacturing capacity in Saudi Arabia.

Menendez linked his concerns to a congressional effort to block arms sales to Saudi Arabia and the United Arab Emirates in 2019, which was given greater attention when President Donald Trump fired the State Department's inspector general on May 15. Speaker of the House Nancy Pelosi (D-Calif.) sent a letter to Trump on May 18, saying, "It is alarming to see news reports that your action may have been in response to Inspector General [Steve] Linick nearing completion of an investigation into the approval of billions of dollars in arms sales to Saudi Arabia."

After Secretary of State Mike Pompeo declared that weapons sales to the countries needed to proceed on an emergency basis in May 2019, bypassing the 30-day notification period, both chambers passed resolutions of disapproval that the president vetoed last July. (See *ACT*, September 2019.) Members of Congress had asked for the inspector general to start an investigation into the arms sales.

Overall, between March 30 and May 28, Congress was notified of potential foreign military sales of approximately $7.5 billion. If annualized, that pace of $45 billion for sales notifications would be lower than the nearly $70 billion in sales that were notified in 2019.

The recent notifications included two possible attack helicopters sales, valued at either $1.5 billion or $450 million, for a bid request issued by the Duterte regime in the Philippines, as well as $2.3 billion to refurbish 43 Apache attack helicopters in Egypt and $556 million to sell 4,569 mine-resistant ambush protected vehicles to the United Arab Emirates that were declared excess defense articles in 2014. Potential sales to Hungary, Taiwan, and India, valued at $230 million, $180 million and $155 million, respectively, were notified during the period, which also included Kuwait, Morocco, the Netherlands, and South Korea as possible clients.

As expected, the May 20 notification of the potential sale of 18 heavy-weight torpedoes to Taiwan for $180 million elicited Chinese opposition. —*JEFF ABRAMSON*

Arms Sales Notifications Under the FMS Program (March 30–May 28)

Country	Estimated costs ($ millions)	Main items	Date(s) of notification
Egypt	2,300	equipment to refurbish 43 Apache attack helicopters	May 7
Hungary	230	60 advanced medium range air-to-air missiles	May 8
India	155	10 Harpoon air launched missiles and 16 MK 54 lightweight torpedoes	April 13
Kuwait	1,425	84 PAC-3 missiles and other Patriot missile support	May 28
Morocco	62	10 Harpoon air launched missiles	April 14
Netherlands	41	Excalibur projectiles for self-propelled howitzers	April 10
Philippines	1,500 or 450	6 Apache attack helicopters or AH-1Z attack helicopters	April 30
South Korea	869	F-35 support services and F-16 upgrades	March 30 and April 10
Taiwan	180	18 heavy-weight torpedoes	May 20
United Arab Emirates	706	4,569 mine resistant ambush protected vehicles (MRAPs) and helicopter spare parts	April 23 and May 7
TOTAL*	**Approximately $7.5 billion**	* the Philippines notification is for either $1.5 billion or $450 million—the higher value is used here	

Source: U.S. Defense Security Cooperation Agency

German Politicians Renew Nuclear Basing Debate

A senior member of the German Parliament has revitalized the debate over whether the nation should host U.S. nuclear weapons on German soil. "It is about time that Germany in the future excludes the deployment" of nuclear weapons on its territory, said Rolf Mützenich, the leader of the Social Democrat (SPD) group in the Bundestag, in a May 2 interview with *Der Tagesspiegel*. The German Social Democrats are coalition partners of the conservative Christian Democrat Union (CDU). The SPD leadership backed Mützenich's comments.

The discussion followed a mid-April decision by the Defense Ministry to replace Germany's current fleet of Tornado aircraft, some of which are dual-capable with 90 Eurofighter Typhoon and 45 U.S. F-18 fighter aircraft. Thirty of the F-18s would be certified to carry U.S. nuclear weapons.

Under nuclear sharing arrangements, NATO allies jointly discuss, plan, and train nuclear missions. According to Hans Kristensen of the Federation of American Scientists, Belgium, Germany, Italy, the Netherlands, and Turkey host up to 150 U.S. B-61 nuclear gravity bombs on their territory. These countries, except Turkey, provide their own aircraft capable of delivering nuclear weapons in times of war. Details of the arrangements remain shrouded in secrecy, but 20 U.S. nuclear weapons are estimated to be deployed at Büchel air base in western Germany.

The Tornado replacement has been controversial for years. Washington has been lobbying Berlin to follow the example of other host nations and buy U.S. F-35 aircraft as the future nuclear weapons carrier.

France prefers a European approach, and it is jointly developing with Germany and Spain the Future Combat Air System (FCAS), a sixth-generation fighter aircraft that will have a nuclear capability in the French Air Force. Germany's selection of the F-18 was thus a political compromise which Defense Minister Annegret Kramp-Karrenbauer presented as a "bridge solution" until the FCAS becomes operational after 2040. Germany plans to retire the Tornado between 2025 and 2030.

Kramp-Karrenbauer may have mishandled the process by not sufficiently consulting with SPD members in the parliament. She has conceded that the Bundestag would not need to make a decision until 2022 at the earliest and said that there would thus be "space for a debate" on the dual-capable aircraft decision in the campaign for the September 2021 parliamentary elections and negotiations on a new coalition government thereafter.

In a May 7 article in *Internationale Politik und Gesellschaft*, Mützenich took up that invitation, saying that he would like "an open and honest debate about the rationale for nuclear sharing." Social Democrats "are not calling for the immediate denuclearization of NATO," but want to discuss the need "to spend billions on the procurement and maintenance of U.S. aircraft whose sole purpose is to drop American nuclear bombs," he wrote.

Katja Keul, spokeswoman on disarmament policy for the Green party, told *Arms Control Today* in a May 14 interview that the Greens "do not want to put Germany on a path of continued involvement in technical sharing arrangements by committing to the procurement of a new nuclear-capable aircraft now." Based on current polls, many expect the Greens to be part of Germany's next government.

A U.S. F-18 fighter aircraft refuels in 2017. Germany has decided to acquire 45 F-18s from the United States, 30 of which would be nuclear capable. (Photo: Tomasz Makowski/U.S. Air Force)

Keul, like other proponents of change, separated Germany's role as a host nation from the continued participation in NATO political bodies associated with nuclear sharing, such as the Nuclear Planning Group. By contrast, those who have argued in favor of preserving the nuclear status quo have often conflated technical and political dimensions of sharing arrangements, equating the end of forward deployment of U.S. nuclear weapons with a denuclearization of the alliance or even the end of deterrence.

The idea that NATO's consultative mechanisms provide Berlin with influence on the policies of its nuclear allies has always been a key rationale for German involvement in them.

But Mützenich argued that this concept of *Mitsprache* is no more than a "long-held pious hope," arguing that "non-nuclear powers do not have any influence on the nuclear strategy, let alone when it comes to the deployment options of nuclear powers." He cited the U.S. withdrawals from the Intermediate-Range Nuclear Forces Treaty and the 2015 Iran nuclear deal, as well as the "reorientation of U.S. nuclear weapons as a means of conducting warfare," as examples of recent Trump administration decisions that contravene European interests.

Roderich Kiesewetter, CDU spokesman for the Bundestag's Foreign Affairs Committee, told *Arms Control Today* on May 12 that NATO's unique nuclear sharing arrangements are important because they "guarantee trust in the extended nuclear umbrella and thus avoid nuclear proliferation in the European theater." But he added that "it would be naive to believe that a U.S. president would grant Europeans influence on U.S. nuclear strategy or a more general say on the use of U.S. nuclear weapons in conflict."

By contrast, Richard A. Grenell, U.S. ambassador in Berlin, in a May 14 opinion piece in *Die Welt* claimed that "Germany's participation in nuclear share ensures that its voice matters."

In dozens of commentaries, conservative decision-makers, analysts, and pundits have accused withdrawal proponents of

weakening NATO cohesion. In an obvious aside to his party colleague Mützenich, Foreign Minister Heiko Maas warned on May 4 that one-sided steps "weaken our alliances." Georgette Mosbacher, the U.S. ambassador to Poland, in a May 15 tweet suggested that "if Germany wants to diminish nuclear capability and weaken NATO, perhaps Poland—which pays its fair share, understands the risks, and is on NATO's eastern flank—could house the capabilities."

In fact, there is broad agreement in Berlin that "it is important to bring this debate to the European level and to discuss it with NATO partners," Gabriela Heinrich, deputy leader of the SPD Parliamentary Group, told *Arms Control Today* on May 13.

But different preferences exist on the direction and structure of a discussion with alliance partners. Keul said the Greens want "Germany to push for a new consensus in NATO that would pave the way for the withdrawal of U.S. nuclear weapons from Europe. That would be our plan A." She cautioned that "because such a consensus will be difficult to achieve, our plan B would be to ask for understanding that Germany will end the deployment of U.S. nuclear weapons on its territory once the Tornado reaches the end of its lifetime."

Kiesewetter pointed out that "it matters who is the sender of messages on nuclear issues across the Atlantic." He suggested that, "to avoid the impression of unilateralism, the five nuclear host nations should first among themselves discuss what their position on the future of nuclear sharing is." Then, Kiesewetter said, "we should also consult with central and eastern European countries what package of non-nuclear defense and deterrence measures might provide complimentary reassurances and can be an effective deterrent to Russia."

Like others, Keul believes that "the future of nuclear sharing should certainly be on the agenda of the NATO experts group" established by Secretary-General Jens Stoltenberg at end of March. Kiesewetter agrees that "we need an informed debate, including by experts, on the future of nuclear sharing arrangements." The group, co-chaired by former U.S. diplomat A. Wess Mitchell and former German Defense Minister Lothar de Maizière, is to discuss NATO's political role. Heinrich suggested that it would also be "useful if the experts include civil society in their deliberations."

Heinrich said that "there is no pressure to bring the debate on nuclear sharing to a quick conclusion," predicting that it would be an issue in the next federal election. Another waypoint in the debate might be the modernization of U.S. nuclear weapons in Europe. Mützenich stated that he is opposed to "replacing the U.S. tactical nuclear weapons stationed in Büchel with new atomic warheads," referring to U.S. plans to deploy new B61-12 weapons sometime after 2022. —*OLIVER MEIER*

South Korea Tests New Missile

South Korea has furthered the development of its missile forces this spring, conducting two tests of the new Hyunmoo-4, which boasts an 800-kilometer range and an estimated payload capacity of 2 metric tons. The payload capacity is greater than any current missile in the nation's arsenal. Although South Korea conducted both tests in March, news of the tests did not emerge until early May. South Korean media reported that just one of these flew successfully, and South Korean officials have not publicly confirmed or commented on the tests.

The launches were conducted at the South Korean Agency for Defense Development's Anheung test site. The missile's specifications are unconfirmed, but analysts have estimated that the Hyunmoo-4 is solid fueled and similar in design to the Hyunmoo-2 missile, although with a considerably larger payload. The Hyunmoo-4's payload capacity is made possible by a 2017 revision to U.S.-South Korean missile guidelines that eliminated a payload cap of 500 kilograms for missiles with ranges of 800 kilometers.

When South Korea joined the Missile Technology Control Regime (MTCR) in January 2001, it negotiated an agreement with the United States dictating that it would limit its ballistic missiles to a 300-kilometer range and a 500-kilogram payload. (See *ACT*, March 2001.)

Under the MTCR, members commit to control exports of missiles and related technology capable of delivering that payload a distance of 300 kilometers or more. South Korea's adherence to MTCR guidelines marked an expansion of a 1979 U.S.-South Korean memorandum of understanding under which South Korea's missile program was limited to missiles with a range of 180 kilometers and a 500-kilogram payload in exchange for U.S. assistance in ballistic missile development.

In 2012, Seoul and Washington reached a new deal whereby South Korea could extend the range of its missiles up to 800 kilometers while keeping the 500-kilogram payload. The new agreement also granted South Korea the option to increase the payload beyond 500 kilograms for shorter-range missiles. For example, a missile with a maximum range of 500 kilometers could carry a 1,000-kilogram payload, and a missile with a 300-kilometer range could carry a 2,000-kilogram payload.

The extended 800-kilometer range was sought by Seoul and Washington as an appropriate measure to offset the threat posed by North Korea's ballistic missile development. (See *ACT*, November 2012.) But the revision did not go unnoticed by regional nonproliferation experts, who protested that the expanded range was counterproductive to long-term ballistic missile nonproliferation efforts. The amendment was seen as an MTCR exemption due to the fact that although South Korea's missiles are indigenously built, U.S. assistance has bolstered South Korea's ballistic missile development and U.S. assistance was offered in exchange for South Korea's pledge to temper its missile program.

The U.S. Defense Department announced in August 2017 that Washington would again revisit the guidelines constraining South Korea's missile program in order to shore up

South Korea displays a Hyunmoo-2 missile system in 2017. The missile has served as the basis for a new missile with greater range and payload capacity. (Photo: Jung Yeon-Je/AFP/Getty Images)

Seoul's defense against Pyongyang. Pentagon spokesman Capt. Jeff Davis said at the time that "there is currently a limit on the warhead size and missiles that South Korea can have and, yes, it is a topic under active consideration." In December 2017, in part motivated by North Korea's sixth nuclear test that September, U.S. President Donald Trump and South Korean President Moon Jae-in formally agreed to lift the payload caps on Seoul's ballistic missiles. The 800-kilometer-range limit remains in place. (See *ACT*, December 2017.)

Experts have recently speculated that although the Hyunmoo-4 meets the 800-kilometer-range limit, the missile's booster could be used to develop a longer, medium-range missile with a lighter payload in the future.

South Korea undertook the Hyunmoo-4 test at a similar time to when North Korea conducted a set of short-range missile tests. North Korea launched its first missile test of 2020 on March 1 and proceeded to conduct three additional tests that month. (See *ACT*, March 2020.)

Pyongyang did not comment on the Hyunmoo-4 test, but did condemn a South Korean military exercise conducted May 6, a day prior to South Korea's belated announcement of the Hyunmoo-4 test. In a May 8 statement published by the state-run Korean Central News Agency, a spokesperson for North Korea's armed forces criticized South Korea of warmongering and said the drill did "not help the efforts to defuse tension on the Korean peninsula."

Amid these tensions, Japanese, South Korean, and U.S. officials met virtually on May 12 and 13 for the 12th round of trilateral defense talks. According to a May 13 Pentagon statement, the representatives discussed the ongoing threat posed by North Korean nuclear and missile provocations and reaffirmed their commitment to trilateral security. —*JULIA MASTERSON*

Moon: U.S., North Korea Progress Unlikely

South Korean President Moon Jae-in appeared to rule out progress in negotiations between the United States and North Korea until after the U.S. presidential election in November, but expressed his hope that inter-Korean projects will move forward.

In a May 10 speech marking his third anniversary in office, Moon said continued communication between Pyongyang and Washington demonstrates the "trust and will for dialogue" on both sides. He said that it was unclear when the U.S.-North Korean process will achieve results, but he expects the current "slump" in negotiations to continue due to the "political schedule," likely referring to the upcoming U.S. presidential election.

The Trump administration continues to maintain that denuclearization of

North Korea is a priority, but talks between the United States and North Korea have remained stalled since October 2019 and North Korean officials have said that Pyongyang is no longer interested in negotiations. (See *ACT*, May 2020; November 2019.)

In a May 3 interview, U.S. Secretary of State Mike Pompeo said the Trump administration "will continue to work on" denuclearization of North Korea and creating a "brighter future" for the North Korean people, but did not provide any details on the U.S. strategy for resuming negotiations.

Pompeo was responding to questions about the whereabouts and health of North Korean leader Kim Jong Un. Kim was not seen publicly for three weeks in April, prompting rumors about his health and speculation about who would succeed Kim in the event of his death.

Before Kim appeared publicly again May 1, Pompeo said on April 30 that the United States was "prepared for whatever eventuality there is" and that the goal of verifiable denuclearization would remain unchanged, "whoever is leading North Korea."

Moon also said that communications between North Korea and South Korea continue but are "not smooth."

Despite the challenges, Moon said he still hopes to pursue the proposal he laid out in January to advance inter-Korean projects. In a Jan. 7 speech, Moon said that if Seoul and Pyongyang can "identify realistic ways to implement projects to reconnect inter-Korean railroads and roads, it will not only lead to international cooperation but also provide a big boost to the resumption of inter-Korean tourism."

He also mentioned a proposal for "joint quarantine cooperation" to respond to the COVID-19 pandemic.

Moon said the quarantine proposal did not breach U.S. sanctions, which has been a source of tension between South Korea and the United States.

During talks between North and South Korea in 2018 and 2019, Moon proposed several inter-Korean projects that required U.S. sanctions waivers. But the Trump administration maintains that sanctions will remain in place until North Korea denuclearizes. —*KELSEY DAVENPORT*

Speaking on the third anniversary of his inauguration on May 10, South Korean President Moon Jae-in said there was little progress in U.S.-North Korean nuclear talks.
(Photo by Lim Min-Hui/Getty Images)

GAO Seeks Light on Nuclear Cooperation Talks

The U.S. State Department may not have notified Congress regularly about its efforts to negotiate a nuclear energy cooperation agreement with Saudi Arabia, raising questions about whether the Trump administration has been as transparent as required, according an April report by the Government Accountability Office (GAO).

"State officials stated that they consistently provide information to Congress, but the limited information they provided to us does not support this position," the GAO report said.

The 1954 Atomic Energy Act (AEA) requires that the State Department, the lead agency for negotiating nuclear cooperation agreements, with assistance from the Energy Department, keep Congress "fully and currently informed of any initiative or negotiations" for those agreements. The GAO report stated that it is "unclear" whether the relevant agencies have done so in the case of Saudi Arabia.

The GAO determined that formal negotiations on a 123 agreement between the United States and Saudi Arabia took place in 2012 and March 2018. Named after the section of the AEA requiring it, a 123 agreement sets the terms and authorizes cooperation for sharing U.S. peaceful nuclear energy technology, equipment, and materials with other countries.

The auditors identified eight further interactions in which the two countries discussed nuclear cooperation and another five interactions in which a discussion was likely. These additional interactions include bilateral meetings in Washington and Riyadh throughout 2018 and 2019 and a September 2019 letter from U.S. Energy Secretary Rick Perry to his Saudi counterpart,

parts of which Bloomberg reported on at the time. (See *ACT*, October 2019.)

The GAO requested information from the State and Energy departments, as well as the National Security Council and National Nuclear Security Administration. But the report stated that, "[o]verall, the agencies provided us with limited information in response to some categories we requested and did not provide information in other categories." Furthermore, the exact roles played by these various agencies in the U.S.-Saudi negotiations "remain unclear" because the GAO did not receive "information to clarify or corroborate such roles."

Saudi Arabia solicited bids in 2017 from companies in China, France, Russia, South Korea, and the United States for its first two nuclear power reactors, but the kingdom has yet to award a contract. Riyadh plans to build 16 nuclear power reactors over the next 20 to 25 years at a cost of more than $80 billion. (See *ACT*, April 2018.)

When contacted by the GAO for information specifically on dates or details of congressional briefings on U.S.-Saudi nuclear cooperation negotiations, the Energy Department did not respond, and only after reviewing a draft of the GAO report in January 2020 did the State Department provide a list of briefings more broadly on U.S. nuclear cooperation initiatives since 2013. Still, "State officials declined to discuss the details of any congressional briefings" with the GAO, leaving the office unable to "establish the extent and substance of information the agencies provided to Congress on U.S.-Saudi nuclear cooperation negotiations."

Of the information that was provided to the GAO, neither the State nor Energy departments "provided documentation within the time frame of our review to support" their claims that they kept Congress informed of U.S.-Saudi negotiations. In order to receive any information, current and former congressional staff interviewed by the GAO said that they learned of developments in the negotiations from the media or representatives of the nuclear industry. One former congressional staff committee member told the GAO that, "since late 2017, the agencies have only provided information to Congress about the negotiations in response to forceful measures, such as holds on nominations or legislation."

The GAO said that U.S.-Saudi negotiations on a nuclear cooperation agreement have stalled due to two main unresolved issues.

First, Saudi Arabia has not agreed to sign an additional protocol to its International Atomic Energy Agency (IAEA) safeguards agreement. A party to the 1968 nuclear Nonproliferation Treaty, Riyadh has had a comprehensive safeguards agreement with the IAEA since 2009, but has not signed an additional protocol, which provides the IAEA with a broader range of information on nuclear and nuclear-related activities. The fiscal year 2020 National Defense Authorization Act included a provision that countries that want to sign a 123 agreement with the United States must first sign and implement an additional protocol.

Second, Saudi Arabia has not agreed to U.S. demands to refrain from enriching uranium or reprocessing plutonium, politically and militarily sensitive activities that can be used to make nuclear weapons. (See *ACT*, December 2019.) The report also said that the United States might be "willing to accept a temporary restriction on enrichment and reprocessing in its negotiations with Saudi Arabia."

U.S. Secretary of Energy Rick Perry speaks in Washington in November 2019, shortly before he left office. Two months earlier, Perry sent a letter to Saudi energy officials demanding that the nation agree to abstain from nuclear fuel cycle activities in exchange for receiving U.S. technical cooperation.
(Photo: Alex Wong/Getty Images)

In addition, the GAO report stated that Saudi Arabia has been resisting nonproliferation conditions required by the AEA, which lists a total of nine nonproliferation conditions in Section 123. Although "Saudi officials accepted 'the vast majority' of the conditions" in the 2012 negotiations, the report said, the areas of disagreement from 2012 "remained unresolved as of January 2020."

The GAO report ultimately recommends that Congress eliminate broad interpretations of the AEA's requirement to keep Congress fully informed by amending the act to "require regularly scheduled briefings, for instance, on a quarterly basis, and specify expectations for the content of such briefings" on nuclear cooperation initiatives and negotiations. The report also recommends that the secretary of state commit to holding those regularly scheduled, substantive congressional briefings.

Sen. Bob Menendez (D-N.J.), ranking member of the Senate Foreign Relations Committee, and committee member Sen. Marco Rubio (R-Fla.) requested this GAO report in March 2019. Following the report's release, the senators said that "it is clear Congress must reassert its critical role in reviewing nuclear cooperation agreements to ensure these agreements do not pose an unnecessary risk to the United States."—*SHANNON BUGOS*

Security Council Fails on Global Ceasefire

The UN Security Council has been unable to support Secretary-General António Guterres' call for a worldwide ceasefire as COVID-19 ravages the globe. The United States reportedly scuppered a May 8 council resolution that would have supported the ceasefire but referred to the World Health Organization (WHO), a target of President Donald Trump's criticism.

The council began to consider ways to back Guterres after his March 23 proposal. "The fury of the virus illustrates the folly of war. That is why today, I am calling for an immediate global ceasefire in all corners of the world. It is time to put armed conflict on lockdown and focus together on the true fight of our lives," he said.

The draft resolution that followed initially included a direct mention of support for WHO, but after U.S. objections, that language was watered down. The new draft resolution "emphasizes the urgent need to support all countries, as well as all relevant entities of the United Nations system, including specialized health agencies." Even that formulation could not find U.S. support, Reuters reported, as it too obviously referred to WHO.

"This would have been a much more effective appeal for a ceasefire if it had come a month ago. Now it feels a bit lame and late," Richard Gowan, the UN director for the Crisis Group, told Reuters. "The council has lost some credibility as the weeks have gone by, mainly thanks to U.S. obstructionism."

Despite the ceasefire call, major conflicts have continued in several regions. Violence in Afghanistan, for example, continues even after a Feb. 29 U.S.-Taliban peace agreement appears to have reduced Taliban attacks on U.S. and allied forces.

UN Secretary-General Antonio Guterres speaks outside UN Headquarters on March 9. His call for a global ceasefire to allow the world to address the coronavirus pandemic has met with limited success. (Photo: Eduardo Munoz/Getty Images)

"On average, we see more than 100 people killed daily, which includes between 20 to 30 civilians," Mir Aizal Haidari, a member of the Afghan parliament's defense committee, told Radio Free Afghanistan. "The annual cost of the war in Afghanistan is more than $5 billion annually, which means that we end up spending at least $13 million every day."

On May 12, gunmen attacked a maternity hospital in Kabul, killing at least 16 people, while another assault the same day left 24 dead at a funeral in the Nangahar province, NPR reported.

In the Middle East, Saudi Arabia said it was adhering to a self-declared April 10 ceasefire in Yemen that appears to have quieted but not eliminated violence. Refugees in the war-torn nation have continued to be victims of air strikes, the Norwegian Refugee Council reported on May 25.

Meanwhile in North Africa, Libya's internationally recognized government rejected a ceasefire called by its opponents in the nation's civil war, *The Guardian* reported on April 30. The Tripoli-based Government of National Accord said it did not trust the Libyan National Army of renegade leader Khalifa Haftar, according to *The Guardian*. —GREG WEBB

NEWS In Brief

Russia, China Skip Syrian Chemical Weapons Meeting

Russia and China boycotted a May 12 meeting of UN Security Council members and high-ranking officials of the Organisation for the Prohibition of Chemical Weapons (OPCW) held to discuss the findings of the OPCW's April 2020 report that blamed the Syrian Air Force for three incidents of chemical weapons use in a rebel-held Syrian town in March 2017. (See *ACT*, May 2020.)

The meeting was originally intended to be held as a formal session to examine the implementation of Security Council Resolution 2118, which calls for the verified destruction of Syria's chemical weapons and preceded the international effort to destroy Syria's declared stockpile. Instead, council president Estonia opted to hold the meeting in a closed setting using teleconference communications. Syria, although not a council member, was invited to participate in the discussion.

Russia did not join the dialogue and criticized the private setting of the meeting. Vassily Nebenzia, Russia's ambassador to the United Nations, said holding a meeting to discuss Resolution 2118 and the OPCW report behind closed doors contradicted "the slogans of openness and transparency of the Security Council" and "undermine[d] the prerogatives of states-parties to the Chemical Weapons Convention." China abstained from the meeting without comment.

The United Kingdom criticized Russia's absence, saying Moscow was politicizing the discussion of chemical weapons use in Syria and seeking to undermine the OPCW's work.
—JULIA MASTERSON

Panel Vets U.S. Plutonium Disposal Plan

The U.S. plan to dilute and dispose of 34 metric tons of surplus plutonium at the deep-underground Waste Isolation Pilot Plant (WIPP) in New Mexico is technically viable so long as the Energy Department addresses certain concerns, according to a top-level scientific review released April 30.

The dilute-and-dispose process replaced the controversial mixed-oxide (MOX) fuel program, which was designed to turn the surplus material into fuel for civilian power reactors but ran into major cost increases and schedule delays. Since 2014, the Energy Department has sought to end the MOX fuel program in favor of the cheaper process of dilution and disposal, which blends down the plutonium with an inert material for direct disposal at WIPP.

The National Academies of Science, Engineering, and Medicine determined that the dilute-and-dispose process provided "a technically viable disposition alternative to the MOX [fuel] plan, provided that implementation challenges and system vulnerabilities that currently exist within the plan are resolved." The determination was based on the success of earlier demonstrations of the individual steps of the dilute-and-dispose process through other Energy Department programs.

Workers prepare machinery used to move nuclear waste into the Waste Isolation Pilot Plant in New Mexico. A technical review found that a U.S. plan to store surplus plutonium at the site is conditionally viable. (Photo: Sally Mitchell/Flickr)

In 2018, the National Nuclear Security Administration estimated that the process would cost $19.9 billion, or 40 percent of the $49.4 billion cost of continuing the MOX fuel program.

For fiscal year 2020, Congress appropriated $220 million for the Energy Department to close down the program. (See *ACT*, May 2019.) The Trump administration has requested $149 million for fiscal year 2021 to continue the dilute-and-dispose program. *—SHANNON BUGOS*

Lawmakers Press Esper on Landmine Policy

More than 100 members of Congress expressed their "disappointment" over a new U.S. landmine policy in a May 6 letter to Defense Secretary Mark Esper. The message noted that reductions in landmine use and casualties could be put in jeopardy.

Rather than geographically restricting landmine use and setting a notional goal of one day joining the Mine Ban Treaty, the new Trump administration policy announced at the end of January allows for using landmines outside the Korean peninsula. The updated policy also allows combatant commanders to authorize landmine emplacements, a power that was previously held only by the president. (See *ACT*, March 2020.) Thirty-four senators, led by Patrick Leahy (D-Vt.) and including Jack Reed (D-R.I.), ranking member of the Senate Armed Services Committee, signed the congressional oversight letter. In addition, Sens. Susan Collins (R-Maine) and Bernie Sanders (I-Vt.) joined 105 Democrats on the message, led in the House by Rep. Jim McGovern (D-Mass.).

The letter asks Esper a list of 27 questions, grouped into sections. The initial six questions on "specific policy issues" are particularly pointed about whether circumstances have recently changed in terms of threats, weapons technology, and the decision-making process to use landmines. Other questions focus on Pentagon reports that might explain the rationale for the new policy, where landmines might be used, alternatives to the weapons, production, transfer, and stockpiling.

Former Vice President and presumptive Democratic presidential nominee Joe Biden has indicated he would reverse the Trump policy, Vox reported in February. *—JEFF ABRAMSON*

REPORTS OF NOTE

The Strategic Postures of China and India

By Frank O'Donnell and Alexander K. Bollfrass
Belfer Center for Science and International Affairs, Harvard Kennedy School
March 2020

Chinese and Indian military forces engaged in a standoff in 2017 at Doklam, located near the border of Bhutan, China, and India. Following the crisis, India assessed that China holds the conventional and nuclear edge in disputed territories.

The authors of this report, however, suggest that India has under-appreciated conventional advantages over China. Rather than invest in new nuclear weapons platforms, India should instead focus on improving the survivability of its existing forces and launching a global arms control initiative on restraint and transparency.

O'Donnell and Bollfrass base their analysis on published intelligence documents, private documents sourced from regional states, open-source force estimates, and interviews with experts based in China, India, and the United States. *—SHANNON BUGOS*

Trick of the Trade: South Asia's Illicit Nuclear Supply Chains

By C4ADS
April 2020

Long denied nuclear technology that was more easily available to parties of the nuclear Nonproliferation Treaty, India and Pakistan used covert international networks to build much of their civilian and military nuclear programs over decades. The Washington analysis group C4ADS has examined how the two nations continue to use illicit procurement efforts to sustain their nuclear activities.

The 30-page report suggests that using large quantities of publicly available information, an understanding of the procurement networks is more achievable than previously thought. C4ADS examined millions of trade records, for example, to map some of the supply chains that India and Pakistan have created.

The analysis shows that both countries use of hundreds of business entities to acquire nuclear technology. Since receiving an exemption from the Nuclear Suppliers Group (NSG), India has moved to import technology from more NSG countries, but Pakistan works more illicitly, particularly with entities in Asia.—*GREG WEBB*

By Daniel Feakes

IN MEMORIAM

Julian Perry Robinson (1941–2020) Dedicated to Eradicating Chemical and Biological Weapons

Julian Perry Robinson, UK scholar and inspiration to generations of experts in the field of chemical and biological weapons disarmament, passed away April 22 at the age of 78 from COVID-19.

From his student dissertation at Oxford University to his most recent research on the Novichok family of chemical agents and the use of chemical weapons in Syria, Julian devoted himself to the prohibition of the use, development, and possession of chemical and biological weapons. For much of this time, Julian collaborated closely with the Harvard biologist Matthew Meselson, with whom he established the Harvard Sussex Program on Chemical and Biological Weapons in 1990.

After graduating from Oxford, Julian worked as a patent agent in London before moving to the newly established Stockholm International Peace Research Institute (SIPRI) in 1968. At SIPRI, he met his partner of more than 50 years, Mary Kaldor, and wrote much of the seminal six-volume publication *The Problem of Chemical and Biological Warfare*, which is still required reading for anyone entering the field of chemical and biological weapons.

Around the same time, he became a key figure in the chemical and biological weapons work conducted under the auspices of the Pugwash Conferences on Science and World Affairs. Through its chemical and biological weapons study group, Pugwash convened scientists from East and West and had a direct impact on the chemical weapons negotiations in Geneva, which were finally concluded in the early 1990s.

Julian moved back to the United Kingdom in 1971 to join the new Science Policy Research Unit at the University of Sussex, where he stayed for the rest of his life. As an academic, he was a polymath who could discuss on equal terms with experts from any number of disciplines. Technically skilled, he understood that eradicating chemical and biological weapons also requires diplomacy and politics.

Despite his intellectual range, Julian was a modest man who disliked being called an expert.

Despite his intellectual range, Julian was a modest man who disliked being called an expert. He shunned the limelight, often turning down media interviews in favor of quietly assisting journalists and researchers. He was most at home in his book-lined office, his archive, or the nearby pub where hours were spent with visitors discussing ideas and pushing the boundaries of their knowledge.

I started working with Julian in 1996 when he was already well established as an authority on chemical and biological weapons, whether from a scientific, legal, historical, military, or policy perspective. Legions of researchers and students would visit to seek his wisdom and to scour his archive, which is probably the largest nongovernmental source of information on chemical and biological weapons in the world. The late 1990s were heady days for those working to rid the world of chemical and biological weapons. I remember the champagne in Julian's office with which we celebrated the April 1997 entry into force of the Chemical Weapons Convention (CWC) and the high hopes for a legally binding instrument to strengthen the Biological Weapons Convention (BWC).

Although the optimism of the late 1990s was dashed, Julian continued to take the long view, concerned that dramatic advances in chemistry and biology could be subverted for hostile purposes and continually emphasizing the need for international treaties to keep pace with such advances. Before it became commonplace, Julian was attuned to the convergence between biology and chemistry and supported strong links between the BWC and CWC.

Julian's passing leaves a great void in the international chemical and biological weapons community. It is tragically ironic that it was the result of COVID-19 and came on the anniversary of the first battlefield use of chemical weapons in Belgium on April 22, 1915. His legacy will live on, however, physically in the substantial archive that he established at the University of Sussex and intellectually in the generations of academics, researchers, students, diplomats, and officials whom he mentored and assisted. His passing will hopefully serve as a reminder of the importance of international dialogue and multilateral solutions in preventing the future development and use of chemical and biological weapons.

Daniel Feakes [illegible]

By Mahsa Rouhi

Martin B. Malin (1961–2020) Sustaining Security Studies With a Legacy of Mentoring

An outstanding scholar, extraordinary mentor, and a community builder, Martin Malin passed away on April 19. His warmth, humility, and kindness made him more than a colleague and a close friend to many.

Professionally, he will be most remembered for 13 years as executive director of the Project on Managing the Atom at the Belfer Center for Science and International Affairs at the Harvard Kennedy School. He made the project feel like a home for countless students and fellows he mentored and trained throughout his career. It is rare to meet a scholar from the nuclear policy community who has not known Marty. The mere mention of his name will bring a smile across the face of all who knew him.

Before the project, Marty studied political science in graduate school at Columbia University, where he received a master's in international affairs, a doctorate in political science, and was editor-in-chief of *Journal of International Affairs*. Later, he directed of the Program on Science and Global Security at the American Academy of Arts and Sciences, where he chaired the Committee on International Security Studies and helped to implement many of the committee's tasks and ventures. He co-authored *War With Iraq—Costs, Consequences and Alternatives* and co-edited the book series *American Academy Studies in Global Security*.

Marty participated in numerous other studies, including co-authoring and co-editing on issues of nuclear terrorism, nuclear weapons, black market nuclear trade, nonproliferation, and a nuclear-weapon-free zone in the Middle East, about which he was truly passionate.

Photo: Belfer Center, Harvard Kennedy School

His most profound legacy will be his impact on the many scholars he mentored. He truly believed that, with sound scholarship and by empowering generations of scholars in the nuclear field, we can hope to tackle the world's problems.

I met Marty when I joined the Project on Managing the Atom as an intern in 2008. Along with Matthew Bunn and Steven E. Miller, he built the project with a great sense of community and encouragement for all those around him. For many of us fellows at the project, this community became a place we could call home during our brief time there. I returned to Belfer again in 2010 as a predoctoral fellow and from 2016 to 2018 as a postdoctoral fellow. For international fellows in particular, he cared deeply about ensuring they had a second home. From lending an ear when I felt homesick to helping me navigate the U.S. health care system to providing writing and editing support to those who did not speak English as their first language, he was always there to support fellows.

Through his mentoring, Marty encouraged all those around him to speak up, to write, and to collaborate without ever making anyone feel pressured to do so, giving voice to those whom he mentored. He especially cared to encourage the diversity of this voice from underrepresented scholars, including women, international students, and those from different ethnic backgrounds.

As a mentor, Marty was generous with his time to support our professional and personal endeavors, always there and willing to listen. He helped us to find our own way in a field that can present a puzzling number of career paths. Marty held our hands through difficult times, provided us with opportunities to grow, and celebrated our achievements, simply giving us his genuine unconditional support.

In 2017, I was in the process of becoming a U.S. citizen at the same time the Trump administration issued its first round of travel bans, which included my home country of Iran. I was becoming a citizen of a country that would not allow my family to visit. The process was an emotional rollercoaster, and Marty was so supportive and understanding during that arduous time. It was because of genuine people like him that I thought I should feel proud to become a U.S. citizen. Marty gave hope and confidence that what we all do matters and that if we work together, we can truly make the world a better place.

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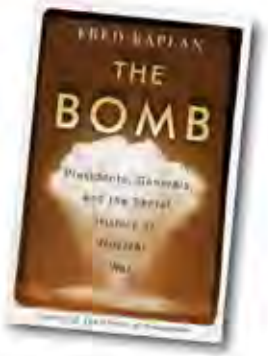
Reviewed by Nina Tannenwald

BOOK REVIEW

Reining in Nuclear War Planners: A Checkered History of U.S. Civilian Leaders



The Bomb: Presidents, Generals, and the Secret History of Nuclear War
By Fred Kaplan
(Simon and Schuster, 2020), 384 pages

In the late 1980s, Fred Kaplan's book *The Wizards of Armageddon* was required reading if you hoped to pass your exams in security studies. That book, as its title aptly suggested, focused on the theorists of nuclear deterrence and other "defense intellectuals" whose novel ideas about deterrence helped shape U.S. nuclear strategy during the Cold War. Now a cult classic for nuclear nerds, it was a path-breaking intellectual history of the people and ideas behind the concept of nuclear deterrence.

Kaplan's newest book, 36 years later, synthesizes a lifetime of research and reporting to provide an overview of U.S. nuclear deterrence policy, from 1945 to the present, with the perspectives of presidents, their advisers, and the generals in charge of the nuclear arsenal. Kaplan, the long-time national security columnist at *Slate*, traces their efforts to wrestle with the political, military, and moral paradoxes of threatening all-out nuclear catastrophe as a way to protect the country. Kaplan brings to the task his expert command of the issues, a historian's appreciation for the archives, and a journalist's gift for lively, accessible writing and vivid storytelling. He appears to have interviewed every important person, looked at every archive, and viewed every TV interview. The outlines of this story are generally known, especially with regard to the Cold War years, but Kaplan's account provides important new detail while carrying the story up to the present. The result is an overview of the politics and logic of seven decades of U.S. nuclear war planning that is gripping, illuminating, and ultimately frightening. This book should have wide readership, including in the classroom.

The title of Kaplan's latest book is slightly misleading. It is not about nuclear war but rather about U.S. war plans and planning, as well as the efforts of U.S. leaders to avoid nuclear war in crises. As Kaplan's own account drives home, the Pentagon's war plans may or may not have any meaningful relationship to any actual nuclear war a president might wage. Since nuclear weapons have not been used since 1945, nuclear war planning is an abstract exercise conducted in the absence of any real evidence about how nuclear exchanges might actually take place. Presidents and their military planners can only imagine such a war, leading one scholar to refer to nuclear strategy as the "imaginary science." The numerous unknowns of nuclear war planning give rise to many of the political dynamics and the tortuous strategic logic explored in Kaplan's book.

The book focuses on the ambitious and often unsuccessful efforts of presidents and their civilian advisers to impose some restraint on the size of the nuclear arsenal and to shift the targeting plans away from a massive, all-out strike to more "controllable" options. Kaplan introduces us to the people and personalities who have shaped the U.S. nuclear arsenal and plans for its use, while taking us into discussions deep inside the Pentagon, at the White House, and at Strategic Air Command (SAC) headquarters in Omaha. Throughout, Kaplan tells dramatic stories of presidents often standing up to their hawkish military advisers to avoid getting into a nuclear war or even just to pursue arms control. He provides new details about how John Kennedy faced crises in Berlin and Cuba, Jimmy Carter dealt with arms control, Ronald Reagan at first embraced nuclear warfighting and then nuclear abolition, Bill Clinton and George W. Bush dealt with North Korea, and Barack Obama put disarmament on the agenda.

Interservice rivalries between the Army, Navy, and Air Force drove nuclear policy in the early years after 1945 and helped set the precedent for a shaky nuclear arms build-up and a U.S. nuclear war plan that threatened massive, all-out nuclear strikes on the Soviet Union and China.

Subsequent chapters then delve into the efforts of presidents and their advisers, beginning with Kennedy, to seek alternatives to the massive first-strike plan of the Single Integrated Operational Plan (SIOP) for nuclear war, that would have killed millions of Soviet and Chinese citizens. The civilian leaders also faced steady resistance from the generals at SAC and the Joint Chiefs of Staff who would actually control the nuclear strikes. Kennedy's defense secretary, Robert McNamara, famously toyed with the idea of a "counterforce" doctrine that would target Soviet missiles rather than cities, but abandoned it when he realized

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that it would lead the military chiefs to ask for even more weapons. In the end, McNamara compromised by letting them have 1,000 intercontinental ballistic missiles, more than he thought necessary for deterring the Soviet Union. He also accepted a public declaratory doctrine that emphasized "assured destruction," a policy he knew to be inconsistent with the SIOP's first-strike plans.

Inconsistency and contradiction became dominant themes. In the 1970s, President Richard Nixon and Secretary of State Henry Kissinger were frustrated by the lack of options in the SIOP and wrestled with the puzzle of how to fight a "limited" nuclear war to protect allies in Europe and Asia. Given that no one could figure out how to keep a limited war limited, however, they could not come up with a scenario in which the United States was better off using nuclear weapons first. Kaplan traces how Carter, who abhorred nuclear weapons, reluctantly approved medium-range missiles in Europe because they were politically useful although of marginal military value. Ironically, as Kaplan shows, it was under the hawkish Reagan administration, which advocated "prevailing" in a nuclear war, that the first effective effort to take a scalpel to the SIOP began, resulting in the biggest cuts in the nuclear arsenal until then.

Kaplan brings important new detail to both familiar and lesser-known cases. Particularly notable are his expansive account of Deputy National Security Advisor Carl Kaysen's first-strike planning during the 1961 Berlin crisis, as well as the fascinating and detailed story of the successful efforts of Frank Miller and a group of civilians in the Pentagon during the late 1980s to make deep cuts in the number of strategic weapons. Closer to the present, drawing on recent reporting and interviewing, he provides an illuminating account of how Obama, the "disarmament" president, was beaten back by the defense establishment and its strategic dogmas. He also traces the writing of and arguments behind the Trump administration's 2018 Nuclear Posture Review and its controversial revival of the concept of limited nuclear war.

Kaplan's sympathies clearly lie with the civilian leaders trying to reel in overkill in the face of resistance from recalcitrant generals. Yet, even former Obama Defense Secretary Ashton Carter, once the boy wonder of "nuclear winter" analysis in the 1980s, comes in for criticism for drinking the Kool-Aid on the need to maintain a threat of first use and resisting Obama's efforts to move to a "sole use" policy.

Overall, the book provides a devastating portrayal of the insanity of the nuclear targeting process. In one case, 69 warheads were targeted on a single Soviet anti-ballistic missile site. In 1990, SAC commander Jack Chain told Congress that he needed 10,000 weapons because SAC had identified 10,000 targets, rather than defining any strategic goal. Achieving excessive destruction was a goal in itself. As Kaplan writes, "The SIOP was a broken machine, the discombobulated aggregate of compartmentalized calculations."

Kaplan's account makes clear that civilian leaders from Kennedy to Obama,

as well as some military officers, were appalled by the massive overkill of the war plans. Kissinger called the SIOP a "horror strategy." Yet, every president faced stiff resistance in trying to wrest control over the nuclear arsenal from SAC and the Joint Chiefs. Regardless of the publicly stated nuclear doctrine, the generals have pushed for a first-strike capability from the beginning and remained skeptical of graduated options. People who knew better, such as McNamara, argued for larger than necessary arsenals simply for political and bureaucratic reasons. Still, even those who advocated for "controlled" options had to admit that, in the end, this was magical thinking.

The take-home message of Kaplan's book is sobering. Despite the much-vaunted civilian control over the military that supposedly exists in the United States, the story told here suggests the opposite. The SIOP did not necessarily reflect the president's desires or policies. Even when there was guidance for limited options, SAC did not follow it. Moreover, when war plans might have looked like they contained options, a closer look would reveal that even the smallest strike was still massive, and SAC consistently had ways of understating the damage.

This is not a very reassuring story for the command and control of the nuclear arsenal today. At the same time, it may reflect a point on which, ironically, the hawkish generals and the pro-nuclear abolition advocates might agree: the notion of a limited nuclear war is simply meaningless.

It also suggests that, in the end, there seem to be no answers to the paradoxes of nuclear strategy. Kaplan employs the metaphor of "going down the rabbit hole" to describe the effort to parse nuclear abstractions or to resolve the paradox of threatening a catastrophically destructive war you would never really want to fight, until you finally give up because the questions, such as whether there is such thing as a limited nuclear war, are ultimately unanswerable. As this masterful book shows, every U.S. administration has begun with an effort to get a rational grip on the nuclear arsenal and, in the end, like every administration before it, has gone down the rabbit hole of nuclear abstractions.

BOOKS OF NOTE

The Button: The New Nuclear Arms Race and Presidential Power from Truman to Trump

William J. Perry and Tom Z. Collina
June 30, 2020

Former Defense Secretary William Perry and Tom Collina, director of policy at the Ploughshares Fund, join forces to write a history of U.S. nuclear launch authority policy.

The president of the United States holds sole authority to launch nuclear weapons from the U.S. arsenal, a policy the authors call dangerous, as it could cause nuclear powers to blunder into a nuclear war by mistake. To illustrate that point, the book opens with a simulation in which a U.S. president becomes alerted to an incoming Russian nuclear strike and decides to respond in kind before receiving word that the alert was false. At that point, however, hundreds of U.S. nuclear weapons are already en route to Russia with no option of recalling them.

Such sole authority is not the only dangerous U.S. nuclear policy. Others include the policies that allow for the United States to launch nuclear weapons first, to keep nuclear weapons on hair-trigger alert, and to sustain the land-based leg of the nuclear triad.—*SHANNON BUGOS*

The Evolution of Nuclear Strategy: New, Updated and Completely Revised

Lawrence Freedman and Jeffrey Michaels (Fourth edition, 2019)

Updating the classic 1981 work on the history of the thinking about the role of nuclear weapons, the Kings College London duo of Lawrence Freedman and Jeffrey Michaels have produced a new, comprehensive, and nuanced overview of military and diplomatic thinking about the role of nuclear weapons from the beginning of the nuclear age to the present day. This edition, which substantially reworks earlier editions, covers—in 678 pages—a vast range of developments and debates over the role of nuclear weapons, and unique problems they present.

In particular, the book explores how "states attempt to incorporate nuclear weapons into their security policies," despite "the horrific consequences of their use, and the possibility that any use might lead to retaliation in kind." They conclude that there are no definitive answers. "The likely dynamics and consequences of nuclear employment remain matters for inference and conjecture."

In clear language, Freedman and Michaels cover a vast range of topics from the early rationale behind the bombing of Hiroshima, through the Cold War-era of U.S.-Soviet nuclear deterrence and war-fighting plans, how other nuclear actors factor nuclear weapons into their policies, and nuclear weapons deterrence strategies of the current era.

The new edition of *The Evolution of Nuclear Strategy* remains an important reference guide to the sometimes esoteric, but consequential field of official nuclear strategy, and how it may or may not align with reality.—*DARYL G. KIMBALL*

Prevention Is the Only Cure

The Arms Control Association continues to work hard to defend, reinforce, and build up the arms control and disarmament measures that help protect us all from the world's most dangerous weapons.

When it comes to nuclear weapons, mitigation and vaccines are not an option.

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