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RE: Prototype Mobile Microreactor EIS Comments

Mobile Microreactor EIS Comment
c/o Leidos
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Filed via email to: **Pele_NEPA@sco.mil**

To Whom it may concern,

The Department of Defense (DOD) acting through the Strategic Capabilities Office (SCO) and in close collaboration with the U.S. Department of Energy (DOE) plans on building a "warfighter mobile nuclear reactor power generation" unit at one of 3 Idaho National Laboratory (INL) sites operated by DOE. DOD wants to develop a "prototype advanced mobile nuclear microreactor to support DOD domestic energy demands, DOD operational and mission energy demands, and Defense Support to Civil Authorities mission capabilities." The 3/3/20 Notice of Intent [1] to prepare an Environmental Impact Statement is available for viewing online at:
https://www.federalregister.gov/
https://www.mobilemicroreactoreis.com/comment.aspx

The Environmental Defense Institute has been monitoring DOE's INL operations for over 30 years and can categorically say the US Army and DOE's record of mismanagement of INL nuclear projects has resulted in extensive radiation contamination to the Idaho region. Therefore, we are opposed to this prototype advanced mobile nuclear microreactor for reasons we layout below.

Because of the existential threat of climate disaster, these DOD/DOE nuclear addicts have ignored, they must add to the scope of this EIS alternative renewable energy and offer a demonstration for these energy applications. These renewable energy sources will not – as our below discussion demonstrates – add to the radiation contamination of Idaho's air and water.

INL Background

In 1948 the Atomic Energy Commission (AEC) made the decision to expand reactor development and spent fuel chemical processing for nuclear weapons materials. Originally the

[1] 12274 Federal Register / Vol. 85, No. 41 / Monday, March 2, 2020 / Notice of Intent to Prepare an Environmental Impact Statement for Construction and Demonstration of a Prototype Advanced Mobile Nuclear Microreactor

AEC named the new Idaho reactor site the National Reactor Testing Station (NRTS), and 141,000 additional acres were acquired north and east of the NRTS (for a total of 572,000 acres) as further environmental safeguard and buffer zone for expanded operations.

Over INL's 70+ year history, 52 nuclear reactors were built at INL - currently 3 are operating and another 10 are shutdown but operable. This represents the largest concentration of reactors in the world. [2] In addition to these reactors are facilities that process large quantities of high-level radioactive and chemical materials that have never been properly/legally managed. [3]

INL has had forty-two reactor meltdowns in its history of operations. Sixteen of these meltdowns were accidents. The remaining twenty-six were experimental/intentional meltdowns to test reactor design parameters, fuel design, and radiation releases. These nuclear experiments were conducted with little regard to the radiation exposure to workers and surrounding residents. Below is a partial listing of the more notable meltdowns and criticality releases. See Citizens Guide to INL IX Appendix (A) for a listing of acknowledged melt-downs, accidents, and experimental radioactive releases. The term accidental, used by DOE, is perhaps not an appropriate term any more than when the term is applied to a hot-rodder who "accidentally" crashes his car while speeding at 100 miles per hour down a road designed for 30 mph. Hot-rodding a nuclear reactor just to see what it will take is no accident and no less irresponsible. [4]

DOD Plan for INL

According to DOD, three INL locations are currently under consideration; Idaho Nuclear Technology Center (INTEC) ICPP-691, Materials and Fuels Complex (MFC) ERB-II, and the Power Burst Facility (PBF) Critical Infrastructure Test Range. Initially, DOD will build a prototype inside an existing structure and after hot run testing move the reactor to an INL outside location for additional hot tests. We discuss each of these sites more below.

Idahoans remember when DOD built the Army's SL-1 small mobile reactor at the Idaho National Laboratory back in the 1960's because it exploded marking the first nuclear reactor accident that killed 3 operators. Operational mismanagement by the Army and contractor (Combustion Engineering) caused the explosion spreading significant radiation around the region. [5] A crucial element that his new mobile reactor will share with the SL-1 design is there will be little to no radiation containment structure required for Nuclear Regulatory Commission (NRC) licensed reactors. Since the cause of the SL-1 explosion was gross materials/oversight/management problems, DOD appears to be ready to repeat the same old mistakes by stating in the NOI:

> "The microreactor must keep radiation exposure during power operation, abnormal operations, or upset conditions, as low as reasonably achievable. SCO seeks to produce a prototype that will minimize consequences to the nearby environment and population in case of kinetic or non-kinetic action affecting structural integrity or release of

[2] DOE/EH/OEV-22-P, pg,2-8

[3] Citizens Guide to INL, Pg. 15 http://environmental-defense-institute.org/publications/GUIDE.963.pdf

[4] Guide pg. 20

[5] Tami Thatcher, *The SL-1 Accident Consequences*, http://environmental-defense-institute.org/publications/SL-1Consequences.pdf

> contamination Further, [Strategic Capabilities Office] SCO seeks to utilize nuclear materials in the construction of a prototype microreactor that, if damaged, do not generate and impose excessive training and equipping burdens on forward area first responders, site medical facilities, or supported military personnel and the civilian population." [6]

INL is desperate for a new mission to justify its existence other than cleaning-up its' huge legacy nuclear waste. DOD knows that the nuclear power option is the most expensive compared to renewables – plus and more importantly - there is no permanent deep geological disposal site for the high-level waste these reactors will generate. Tragically, nuclear waste production has never been an issue DOD/DOE have ever been concerned about. It's fine to continue to use Idaho as their nuclear waste dump. DOE/DOE 70+ year history of INL mismanagement and total disregard of the health and environmental effects of their operations is prima-facia evidence that they can **NOT** be trusted for anything other than cleanup of the mess they've already made. [7]

Since DOE is self-regulated, its nuclear facilities do not come under the full regulatory authority of the Nuclear Regulatory Commission (NRC). Consequently, this new mobile nuclear microreactor will also not be required to meet NRC design/operation/safety specifications; though DOE claims to seek NRC consultation, it "does not require an NRC license."

DOD claims to need a prototype advanced mobile nuclear microreactor to support DOD domestic energy demands capable of producing 1–10 megawatts of electrical power, DOD operational and mission energy demands, and Defense Support to Civil Authorities mission capabilities. Given DOD/DOE track record their claim below sounds ridiculous:

"The microreactor must keep radiation exposure during power operation, abnormal operations, or upset conditions, as low as reasonably achievable. SCO seeks to produce a prototype that will minimize consequences to the nearby environment and population in case of kinetic or non-kinetic action affecting structural integrity or release of contamination. Further, [Strategic Capabilities Office] SCO seeks to utilize nuclear materials in the construction of a prototype microreactor that, if damaged, do not generate and impose excessive training and equipping burdens on forward area first responders, site medical facilities, or supported military personnel and the civilian population."

Each of the INL locations DOD/DOE are considering have their own major contamination issues from previous operations. EDI's extensive contamination reports on each site in the following indoor/outdoor locations at INL must be considered in the EIS review process before making the decision to select INL.

- "Conduct mobile microreactor core fueling and final assembly at MFC's Hot Fuel Examination Facility (HFEF) or the Transient Reactor Test Facility (TREAT) located about 0.5-mile northwest of MFC.

[6] 12274 Federal Register / Vol. 85, No. 41 / Monday, March 2, 2020 / Notice of Intent to Prepare an Environmental Impact Statement for Construction and Demonstration of a Prototype Advanced Mobile Nuclear Microreactor

[7] See 1995 Settlement Agreement and Consent Order against DOE/INL for mismanagement of nuclear waste.

- "Conduct mobile microreactor startup testing at MFC's National Reactor Innovation Center (NRIC) Demonstration of Operational Microreactor Experiments (DOME) or CITRC;
- "Temporarily store the mobile microreactor at MFC's Radioactive Scrap and Waste Facility (RSWF) or Outdoor Radioactive Storage Area (ORSA).

The mobile microreactor design determination by SCO will precede the decisions supported by this EIS. However, the analysis of impacts is applicable to (i.e., bounds) whichever of the two-candidate mobile 30 microreactor designs is selected."

INL Accident History must be considered in the EIS scoping

"The accident at the Stationary Low-Power Reactor Number One (SL-1) occurred on January 3, 1961. Located in the Auxiliary Reactor Area**, SL-1 was a small compact Army nuclear power plant designed to generate electricity at remote military locations such as the Arctic or Antarctic.** The reactor served both as an experimental prototype and as a training facility for military personnel. On the bitterly cold afternoon of January 3rd, three Army technicians arrived at the facility for the four to midnight shift. The SL-1 reactor had been shut down for routine maintenance, and the task of the three men that evening was to complete certain preparations for nuclear startup. Apparently, in the process of attaching control rods to drive motors, one of the men raised the central control rod too far and too fast. Evidence indicates that the rod might have stuck momentarily. In the past, there had been sticking problems with that rod. When it came unstuck, it moved upward much higher than anticipated and triggered a supercritical power excursion in the reactor core. In a fraction of a second the power reached a magnitude of an estimated several billion watts, melting and perhaps even vaporizing a large part of the core. The water in the core region was vaporized, creating a devastating steam explosion. The remaining water in the reactor vessel was hurled upward at high velocity, striking the underside of the reactor's pressure lid and lifting the whole nine-ton vessel upward, shearing cooling pipes in the process. The three men, who had been standing atop the reactor vessel, were crushed against the ceiling of the building before the huge vessel dropped back into place. One of the men remained impaled on the ceiling by a piece of control rod rammed through his groin. It all happened in a second or so." [Norton] [emphasis added]

"It [SL-1] was a terrible accident, made even more grisly because the intensely radioactive fission products scattered inside the building by the accident hampered the work of recovering the bodies. Staying in the building for mere seconds resulted in a year's allowable dose of radiation for rescue workers. And it took six days to remove the body that was impaled on the ceiling by use of a remotely operated crane and a closed-circuit television. The bodies were so badly contaminated, the heads and hands of the victims had to be severed and buried with other radioactive wastes at the Radioactive Waste Management Complex." [Norton] The Oil Chemical and Atomic Workers Union protested vigorously that the government refused to provide a proper Christian burial for the workers.

The SL-1 reactor explosion not only resulted in three deaths but also serious exposure of 0.1-0.5 roentgens [rem] to nearly 100 personnel. Over 12 workers received exposure greater than 10

roentgens [rem]. [8] The maximum acknowledged personnel exposure was 1,000 R/hr. (Rad per hour). [9] The exposed reactor was still emitting 22,000 R/hr. five months after the accident. Readings above the reactor one month after the accident were 410 R/hr. [IDO-19301,p.109] [10] 1,128 Ci including 80 Curies of radioactive Iodine were also released during the SL-1 accident. [ERDA-1536,p.II-243] [DOE/ID-12119@A-53] A temperature inversion kept the radiation plume close to the ground and at 25 miles the radioactive iodine levels were 10 times above background. At 100 miles the radiation levels were above background.

The author interviewed the widow of James Dennis who was a member of the SL-1 **in**voluntary Army demolition crew brought in to dismantle the reactor after the accident. Dennis died of a rare blood cancer called Waldenstrom's micro globulin anemia, which his medical documents confirm, was caused by exposure to 50 rem/hr. for nine hours and ten minutes at the SL-1 site. [Dennis,p.10] Dennis' documents further challenge the government's acknowledged exposure of whole body - 2135 mrem, and skin - 3845 mrem [Dennis citing AEC/SL-1,CAB] as grossly understated. Dr. Charles Miller M.C., hematologist / oncologist, chief of Medical Services at Letterman Army Medical Center and Dennis' internal physician, supports the allegation that Dennis' cancer was caused by exposure to radiation. [Dennis, p.17] [11]The government refused to grant Dennis any compensation for his radiation exposure injuries that caused his early death. John Horan, an INL health physics technician, was an expert witness brought in by the Atomic Energy Commission to refute Dennis' claims to radiation induced injuries. Dennis is only one of thousands of individuals who are victims of the health effects of radiation exposure caused by radioactive releases from DOE facilities.

> **"Proposed Action**
> "The prototype microreactor is expected to be a small advanced gas reactor (AGR) using high-assay low enriched uranium (HALEU) tristructural isotropic (TRISO) fuel and air cooling. TRISO fuel is encapsulated and has been demonstrated in the laboratory to be able to withstand temperatures up to 1,800 degrees Celsius, allowing for an inherently safe prototype microreactor.
>
> "The Proposed Action includes construction of the prototype microreactor and demonstration activities. The demonstration activities may include testing of project materials, startup and transient testing and evaluation of the constructed prototype microreactor, transportation and operational testing of the prototype microreactor or its components within the boundaries of the selected site to test and evaluate prototype microreactor mobility, and post-irradiation testing of project materials. The EIS also will cover the planned disposition of the prototype microreactor following operation and demonstration.
>
> "Additionally, there are expected to be ancillary activities necessary to support the Proposed Action. These include the fabrication of reactor fuel, the assembly of test/experimental modules at existing, modified, or newly constructed test/ experiment assembly facilities, and the management of waste and spent nuclear fuel. After irradiation

[8] [IDO-19301@138]
[9] ERDA-1536,p.II-243
[10] IDO-19301,p.109
[11] Dennis, p.17

> of the prototype microreactor, test/experimental cartridges would be transferred to post-irradiation examination facilities. SCO would make use of existing post-irradiation facilities to the extent possible, but existing post-irradiation examination facilities may require expansion or modification." [12]

Based on Environmental Defense Institute 20-year observation of DOD/DOE terrible track record at INL, EDI can categorically say the US Army and DOE's record of mismanagement of INL nuclear projects has resulted in extensive radiation contamination to the Idaho region. Therefore, we are opposed to this prototype advanced mobile nuclear microreactor for reasons we layout above.

Because of the existential threat of climate disaster, these DOD/DOE nuclear addicts have ignored, they must add to the scope of this EIS alternative renewable energy and offer a demonstration for these energy applications. These renewable energy sources will not – as our above discussion demonstrates – add to the extensive radiation contamination of Idaho's air and water.

Additionally, DOD's recent defeat in Afghanistan and inevitable loss in Iraq, demonstrate the US's attempt to establish a hegemony in the region has failed miserably. It is long past time that this country recognizes that wars of empire that might require the type of power sources in "Forward Operating Bases, Remote Operating Bases, and Expeditionary Bases" is over. It's time to put those resources into combating our immediate existential threat of climate disaster. The US military already admits that climate change is an existential threat to America. [13]

Respectfully submitted,

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[12] 12274 Federal Register / Vol. 85, No. 41 / Monday, March 2, 2020 / Notice of Intent to Prepare an Environmental Impact Statement for Construction and Demonstration of a Prototype Advanced Mobile Nuclear Microreactor

[13] Loid Austin, Chairman Pentagon Joint Chiefs of Staff, 10/21.