Nuclear Pit Facility Should Wait for Science and Policy Answers

An American Physical Society panel is urging the federal government to wait until key technical and policy issues are answered before embracing a National Nuclear Security Administration (NNSA) proposal to build a multibillion-dollar facility to manufacture new plutonium cores for the US nuclear weapons stockpile.

The go-slow recommendation, released in a report in late April by the APS panel on public affairs, comes amid growing concern in Congress and among some arms control organizations that the Bush administration is laying the groundwork through budget requests and weapons studies for an eventual resumption of nuclear testing.

While the nuclear weapons debate has many facets, the recent push by NNSA to build a modern pit facility (MPF) to manufacture up to 450 plutonium cores per year has moved the "pits" issue to the forefront of the nuclear arsenal debate. A pit is the hollow metal-clad shell of plutonium that is the core of every nuclear weapon. The US currently has about 8000 pits in its active stockpile and another 3000 in its inactive stockpile, the APS report says.

All of those pits were manufactured at the US Department of Energy's Rocky Flats Plant near Denver, Colorado, which was shut down in 1989 for violations of safety and environmental regulations. No one is sure how long the pits will last, but NNSA officials proposed a new manufacturing facility based on a 45-year lifespan of the existing pits, meaning the oldest pits would need to be replaced by 2023.

After the closure of the Rocky Flats Plant, Los Alamos National Laboratory began developing an improved pit production process and, according to the APS report, has produced a new "stockpile certifiable" pit. NNSA plans call for the Los Alamos facility to produce pits at a rate of 10–20 per year by 2007. But that is far short of the rate NNSA officials believe will be needed to maintain the reliability of the nuclear weapons stockpile.

In June 2003, NNSA published a draft environmental impact statement for five potential sites to build the new manufacturing plant, but in late January, NNSA Director Linton Brooks delayed selection of a preferred site after congressional concern that he was moving too fast. The Bush administration requested $23 million in the fiscal year 2004 budget to fund the conceptual design of a new plant, but Congress approved only $11 million.

Two questions are central to the pit debate: How long will the current pits be viable? And how big will the US nuclear arsenal be in the coming decades? Until those questions are answered, the APS panel concludes, no decision about pit manufacturing should be made. In the executive summary of its report, the APS panel points to three key issues that must be resolved before an MPF is authorized:

▶ Pit facility design and site selection should not proceed until there are more precise estimates of future nuclear force structure. The 2002 Strategic Offensive Reductions Treaty

with Russia calls for a limit of 1700–2200 warheads by 2012 and a reserve of several hundred more. Princeton University's Frank von Hippel, an arms control expert and a member of the APS panel, notes that the 450 pits per year manufacturing capability of the proposed MPF would only be needed for an arsenal of cold war proportions—10 000 or more warheads.

▶ MPF decisions should be deferred, the report says, "while the NNSA enhances the research program on plutonium aging." The APS panel points to a pit-aging experiment being conducted at Los Alamos, "which by 2006 will help determine whether pits can be expected to have a minimum lifetime of 60 years [instead of the NNSA estimate of 45 years]." If the pits last 60 years, the earliest an existing pit would have to be replaced would be 2038, the report says.

▶ Alternative production methods should be more thoroughly studied. Instead of a new $4 billion manufacturing facility capable of producing up to 450 pits per year, the Los Alamos facility might be upgraded to produce 50–80 pits per year. A modular facility that could be expanded if the demand for pits increases should also be considered.

The APS panel also questions NNSA's justification of a large production facility based on the need to produce new types of pits. "If the additional capacity is intended to provide the option of new warhead production, then DOD [US Department of Defense] should justify the need for new warheads before NNSA builds the additional capacity to produce them," the report says. Although it is not stated outright in the APS report, von Hippel and other arms control experts have noted that any new warhead designs would almost certainly require a resumption of nuclear testing.

The panel also calls for an independent organization, such as the National Academy of Sciences or the DOD science advisory group JASON, to do an analysis to determine how to best proceed with pit manufacturing. "Deferring irreversible decisions—such as site selection and MPF design—until after 2006 affords the time to more thoroughly examine the various production options," the APS report concludes. "It also provides the time to include in the assessments the results of the pit-longevity experiment that will be completed in 2006. Finally, it will allow for more accurate estimates of future nuclear force structure to be included in sizing considerations." **Jim Dawson**

US Celebrates Oppenheimer's Centenary

On 25 June, a two-day commemoration of the centenary of J. Robert Oppenheimer's birth kicks off with a dedication by Senators Pete V. Domenici (R-NM) and Jeff Bingaman (D-NM) at the house in Los Alamos, New Mexico, where Oppenheimer and his family lived while he headed the Manhattan Project. The house remains essentially unchanged—it still has the same baby grand piano that Edward Teller once played. Helene and Gerry Suydam, who bought the house in 1946, will stay there as long as they wish, and it will eventually become a museum.

Oppenheimer's is the first of many houses of prominent Manhattan Project physicists that the Los Alamos Historical Society, Los Alamos National Laboratory, and the Washington, DC–based Atomic Heritage Foundation are trying to preserve. Eventually, those organizations hope to turn the area—including some structures currently inside the boundaries of the LANL weapons lab—into a national park accessible to the public.

Organizers of the Oppenheimer commemoration also plan a series of talks and a tour of the Manhattan Project site. Unless security clearances are obtained in time, the tour will consist of slide-show presentations (see http://www.atomicheritage.org for event details).

Also in recognition of the centenary, the office for history of science and technology at the University of California, Berkeley, has launched a Web site that lets visitors explore the contradictions and controversies of Oppenheimer's life (see http://ohst.berkeley.edu/oppenheimer).

After the Manhattan Project, Oppenheimer became director of the Institute for Advanced Study in Princeton,

ATOMIC HERITAGE FOUNDATION

Oppenheimer's Los Alamos home could form the centerpiece of a new national park.