

At DOE, nonproliferation sinks despite its success

Milestones are slipping for US efforts to round up vulnerable fissile materials and convert research reactors to low-enriched uranium.

Meeting in The Hague, the Netherlands, in late March, the US joined nearly three dozen nations in recommitting to secure weapons-usable nuclear materials that are scattered around the world and vulnerable to terrorist theft. But just weeks earlier, President Obama proposed scaling back by nearly one-quarter the administration's signature effort to do just that. In addition, the president indicated he would shelve a half-built \$7.7 billion project to convert US surplus weapons plutonium into reactor fuel, a back-step that would jeopardize a 2011 pact with Russia for each nation to dispose of 34 metric tons of the bomb-usable material.

The administration's fiscal year 2015 budget request (see special report on page 23) proposes to cut the Global Threat Reduction Initiative (GTRI), the Department of Energy program charged with securing vulnerable bomb-usable materials around the world, by \$109 million, to \$333 million. According to budget documents released on 4 March, 5017 kg of highly enriched uranium (HEU) and separated plutonium have been repatriated to the US, Russia, or secure locations since the GTRI's 2004 inception. In addition, the program has verified that 88 HEU-fueled research reactors or isotope production facilities have been closed or converted to use low-enriched uranium. The program also has strengthened security measures at nearly 1900 buildings outside the US that house fissile materials.

Energy secretary Ernest Moniz told the House Appropriations Committee on 2 April that he was disappointed with the proposed reductions in the GTRI's and DOE's other nuclear nonproliferation programs, but he said they were necessary to offset proposed increases for the National Nuclear Security Administration's (NNSA's) nuclear weapons program. Overall, the nonproliferation budget is slated to drop 20%, or \$399 million, to \$1.6 billion. The 2015 request includes \$8.4 billion for nuclear weapons, an increase of \$534 million, or 6.9%. Most of the growth is for work on modifying and extending the lives of three warhead types (see PHYSICS TODAY, December

2013, page 26) and on maintaining the declining weapons stockpile.

A gift basket

On 25 March, 35 of the 53 national leaders attending the third nuclear security summit pledged to implement and codify International Atomic Energy Agency nuclear security guidelines, to accept periodic peer reviews of their security practices, and to ensure that their nuclear security personnel are "demonstrably competent." Currently there are no internationally recognized standards for the training of nuclear security personnel. Page Stoutland, of the nonprofit Nuclear Threat Initiative, notes that some countries where corruption is endemic lack policies to require security screening of personnel who guard or have access to the materials. Together, those conditions present the potential for an insider threat.

The other 18 nations represented, including the nuclear weapons states of Russia, China, India, and Pakistan, declined to sign the pledge. Anne Harrington, deputy administrator of the non-

proliferation program at NNSA, downplayed the refusals. She told a Senate Armed Services Committee hearing that some states simply don't believe in such formalities, but that didn't necessarily mean they wouldn't adhere to the terms. Twenty-three nations, including the US, also agreed to a separate arrangement promising to step up efforts to round up and secure radiological materials, such as cesium-137 and cobalt-60, that could be used to make a dirty bomb.

In the summit's most immediate outcome, Japan announced that it will ship to the US hundreds of kilograms of HEU and plutonium from the Japan Atomic Energy Research Institute's Tokai Research Establishment. The quantity of plutonium at the Fast Critical Assembly facility there is sufficient to fuel 40 weapons, and four gun-type bombs could be fashioned from the HEU held there, according to Matthew Bunn, of Harvard University's Belfer Center for Science and International Affairs. The International Panel on Fissile Materials, a nonprofit watchdog group, reported that the material consists of 331 kg of separated plutonium, which is of UK, US, and French origin, and 199 kg of ^{235}U contained in material enriched to both 93% and 20%. Weapons



NATIONAL NUCLEAR SECURITY ADMINISTRATION

Nuclear materials are loaded for transport from a facility in Italy to secure storage in the US. At the nuclear security summit in March, the two nations announced completion of the transfer of more than 17 kg of UK- and US-origin highly enriched uranium and plutonium stemming from R&D activities in Italy. More than 100 kg of the materials have been removed from Italy since 1997.

grade is generally considered to be 90% or more ^{235}U .

In remarks at the close of the summit, Obama said, "We still have a lot more work to do to fulfill the ambitious goals we set four years ago to fully secure all nuclear and radiological material, civilian and military, so that it can no longer pose a risk to any of our citizens." He noted the initial 2010 summit's achievement of repatriating 128 kg of HEU from Ukraine to Russia: "Had that not happened, those dangerous nuclear materials would still be there now and the difficult situation we're dealing with in Ukraine today would involve yet another level of concern."

Indeed, Bunn says progress at each summit has become more difficult as "more of the low-hanging fruit has been harvested." The biggest caches of inadequately guarded fissile materials have already been moved to more secure locations, such as DOE's Y-12 National Security Complex in Oak Ridge, Tennessee.

Lengthening timelines

"President Obama's Four Year Initiative to secure the most vulnerable nuclear material by the end of 2013 was completed successfully," according to FY 2015 budget documents. However, the president's original goal, as stated in a 2009 speech he delivered in Prague, Czech Republic, was "to secure all vulnerable material around the world within four years."

In FY 2015 the GTRI plans to remove 125 kg of fissile materials, convert four reactors, and make security improvements to 125 buildings abroad. Some of that activity was forward funded with monies from FY 2014, Harrington told the Senate Armed Services Committee on 2 April.

"In this current fiscal environment, difficult decisions are inevitable," Harrington said, adding that the budget will still permit a "robust set of activities" for the nonproliferation programs.

The FY 2015 budget documents added five years to the GTRI's target date, now 2035, for conversion or shutdown of the 200 or so remaining HEU-fueled civilian facilities around the world. Last year's budget set the date as 2030; as recently as 2010, the NNSA's target date had been 2020. And the NNSA target date for securing the world's radiological materials has been set at 2044. "When the president is asked what keeps him awake at night, he says a terrorist nuclear event. So there's a disconnect, in my view, between what the president continues to restate that he wants

and what the bureaucracy is providing," says Kenneth Luongo, former director of DOE's Office of Arms Control and Nonproliferation.

"In a budget where we are spending hundreds of billions every year on national security, and when this is the third president in a row to say that nuclear terrorism is the biggest national security risk, to be slowed by cutting a few hundred million is really penny-wise and pound-foolish," says Bunn.

Luongo, who now heads the Partnership for Global Security think tank, puts it more strongly: "What they are doing in cutting the nonproliferation budget and increasing vulnerability in order to fund the weapons program is a crime against humanity, not just a crime against the taxpayer."

A search for alternatives

Proposed savings of \$215 million, more than half the overall reduction to DOE's nonproliferation budget next year, would result from suspending construction of a mixed oxide (MOX) fuel fabrication plant at DOE's Savannah River Site in South Carolina as the administration explores alternative and cheaper methods for disposing of surplus weapons plutonium. The US and Russia in 2011 agreed to each convert 34 tons of plutonium into fuel suitable for commercial reactors. But the MOX plant's construction cost estimate has soared from \$4.8 billion to \$7.7 billion, and its lifetime cost to operate is \$30 billion. Moniz told House appropriators the original estimate used assumptions that were based on a French MOX plant and failed to account for the two nations' differing nuclear regulatory regimes and other standards. Although Moniz and NNSA officials have repeatedly insisted that the US will abide by its commitment, changing the US disposal method will require reopening negotiations with Russia. "That dialog right now is not so simple," Moniz admitted.

The state of South Carolina filed a lawsuit against DOE on 18 March in a bid to prevent the mothballing. Senator Lindsey Graham (R-SC) told Harrington that there is no viable option to MOX that would be cheaper and meet the 2018 target date for beginning disposition. Graham called the administration "incredibly irresponsible" for breaking agreements with the Russians and the state of South Carolina. He added, "It's going to create problems with weapons-grade plutonium in the hands of the Russians at a time when we need no more problems with the Russians."

David Kramer



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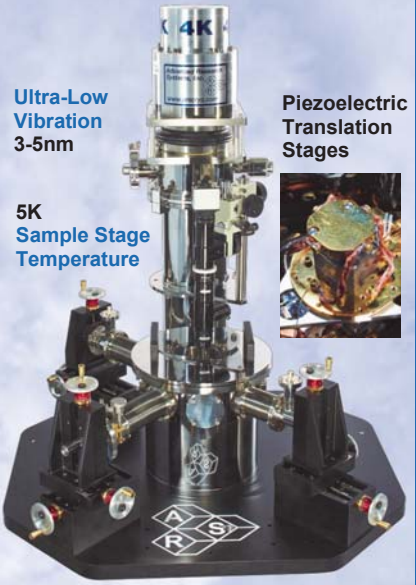
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Tel: +1 610 967 2120
Fax: +1 610 967 2395
www.arscryo.com * ars@arscryo.com