

us. As the budgets get tight, flat, or worse, we feel there's a much better chance of the two of us going through this together, promoting science for the nation in general."

Isaacs and Drell say they're hoping the new partnership with universities gets the reception they had when they, Oak Ridge National Laboratory director Thom Mason, and LBNL director Paul Alivisatos visited Capitol Hill as a

group in the spring of 2011. "We had a very crisp message of supporting the president's budget request and the president's priorities, and we just went around to any office we could get into and made the case for science," says Drell. "We were told by staffers that it was very effective, and they wanted us to do it again this year."

Still, institutions will continue to look out for their separate interests.

"Universities and laboratories will always get across the message to their local congressmen and senators about what they do, and we're not trying to suppress that," says Witherell. "What's new is a group that can talk about the whole university and lab complex together as an ecosystem for research in the physical sciences and engineering funded by the DOE."

David Kramer

Obama urges renewed efforts on arms control

Several nations are reported to have shed all their weapons-usable materials, but the president warns that the threat of nuclear terrorism remains.

Gathering with more than 50 other heads of state in Seoul, South Korea, in late March, President Obama pledged to negotiate further reductions to the US and Russian nuclear arsenals and trumpeted the progress made toward securing the world's vulnerable stocks of highly enriched uranium (HEU) and plutonium since the inaugural 2010 Nuclear Security Summit in Washington, DC.

"I firmly believe that we can ensure the security of the United States and our allies, maintain a strong deterrent against any threat, and still pursue further reductions in our nuclear arsenal," Obama said in a speech at Seoul's Hankuk University of Foreign Studies. "Going forward, we'll continue to seek discussions with Russia on a step we have never taken before—reducing not only our strategic nuclear warheads, but also tactical weapons and warheads in reserve." The New START treaty, which went into force last year, requires each of the two nuclear superpowers to reduce

its strategic stockpile to 1550 deployed weapons and 5000 warheads by 2018.

Obama touted progress made toward the goal he set at the 2010 summit: to secure all civilian inventories of HEU and plutonium by 2014. "South Korea, Japan, Pakistan, and others are building new centers to improve nuclear security and training," Obama said. "Nations like Kazakhstan have moved nuclear materials to more secure locations." Mexico and Ukraine just recently removed all the HEU from their territory, he said, noting that "all told, thousands of pounds of nuclear material have been removed from vulnerable sites around the world."

Nuclear quid pro quo

Among a slew of moves announced in March by the White House and the Department of Energy's National Nuclear Security Administration were the removal of more than 3 kg of plutonium from Sweden—a process that was four years in the making—and the shipment

to Russia of 128 kg of HEU from Ukraine, with assistance from the US. In addition, Belgium, the Netherlands, and France agreed to convert their reactors that produce the medical isotope molybdenum-99 to use low-enriched uranium by 2015 in exchange for a commitment from the US to continue supplying them with HEU until then. The European nations also agreed to "deal in a responsible manner with existing large amounts of scrap HEU resulting from past activities by recycling or disposing them, with the support of the United States and other partners," according to a statement issued jointly by the parties. And the US, Mexico, and Canada announced the removal of an unspecified quantity of HEU from a Mexican research reactor in exchange for a US supply of low-enriched material.

Obama pledged to seek Senate ratification of the Comprehensive Nuclear-Test-Ban Treaty and to propose further nuclear arms cuts when he meets with Russian president-elect Vladimir Putin this month. Obama also invited China to begin a dialog with the US on nuclear arms limits.

But despite the progress made in securing weapons materials, Obama acknowledged the continuing threat of nuclear terrorism. "We know that nuclear material, enough for many weapons, is still being stored without adequate protection. And we know that terrorists and criminal gangs are still trying to get their hands on it—as well as radioactive material for a dirty bomb. We know that just the smallest amount of plutonium—about the size of an apple—could kill hundreds of thousands and spark a global crisis," the president told the Seoul audience.

Diminished role for nukes

The US, Obama vowed, will not develop new nuclear warheads or pursue new military missions for nuclear weapons. "We've narrowed the range



A technician inspects containers of highly enriched uranium aboard a US Air Force cargo plane during an operation to transport the material from a Mexican research reactor to storage at Oak Ridge, Tennessee.

of contingencies under which we would ever use or threaten to use nuclear weapons,” he said. “My administration’s nuclear posture recognizes that the massive nuclear arsenal we inherited from the cold war is poorly suited to today’s threats, including nuclear terrorism.” A comprehensive study of US nuclear forces Obama ordered last summer is still under way, he said. “But even as we have more work to do, we can already say with confidence that we have more nuclear weapons than we need.”

According to a new report from Harvard University’s Belfer Center for Science and International Affairs, the threat of nuclear terrorism continues to grow in Pakistan in tandem with that country’s growing nuclear arsenal and increasingly capable adversaries. The report also noted that 120 research reactors worldwide continue to use HEU. It said that nations with nuclear materials should build up their defenses sufficiently to repel an attack from well-trained and well-armed terrorists and



President Obama and Russian president Dmitry Medvedev confer during the nuclear security summit in Seoul.

should drastically lower the number of locations where the materials are kept.

Former Senator Sam Nunn, cochair of the Nuclear Threat Initiative, said governments still need to establish best

practices for security and benchmark their progress. Greater transparency by governments that possess the materials, he said, is needed in order to build international confidence.

Joseph Cirincione, president of the Ploughshares Fund, calls the summit “underperforming” and says it “didn’t demand attention and didn’t reach for new goals.” He says that plutonium received little attention at the gathering because South Korea has indicated it wants to use mixed oxide fuel—which contains plutonium—in its nuclear reactors.

Cirincione also criticizes the Obama administration for its silence concerning summit remarks by South African president Jacob Zuma that his country may resume producing HEU. In 2010 the South African Nuclear Energy Corp became the first of the world’s major producers of the medical isotope molybdenum-99 to ship a commercial quantity of the material made without HEU (see *PHYSICS TODAY*, February 2011, page 17). **David Kramer**

Nuclear security agency and weapons labs at odds

Micromanagement by NNSA is blamed for adding hundreds of millions of dollars in labs’ extra costs.

A lack of trust between the US Department of Energy’s National Nuclear Security Administration (NNSA) and the nuclear weapons laboratories that it oversees is harming the labs’ scientific productivity, according to a recent report by the National Research Council (NRC) and recent testimony from several former lab directors. “The relationship between NNSA and its [labs] is broken to an extent that very seriously affects the Labs’ capability to manage for quality [science and engineering],” states the NRC report *Managing for High-Quality Science and Engineering at the NNSA National Security Laboratories*. “There has been a breakdown of trust and an erosion of the partnering between the Laboratories and NNSA to solve complex S&E problems; there is conflict and confusion over management roles and responsibilities of organizations and individuals.”

The White House Office of Science and Technology Policy issued a statement on 5 April saying that at its request, the Science and Technology Policy Institute (STPI) is carrying out a study on governance of the laboratories. The statement said the goal of the study is “better understanding [of] various governance structures, including

those in the Departments of Defense, Energy, and Homeland Security; how they are implemented; and governance characteristics that most effectively support national security missions.” The STPI is a federally funded R&D center managed by the Institute for Defense Analyses.

Accretion and accumulation

Cochaired by former Lawrence Berkeley National Laboratory director Charles Shank and UCLA professor C. Kumar Patel, the committee that wrote the NRC report urged the NNSA to reduce reporting and administrative burdens on lab directors and free the lab chiefs to establish strategic science and engineering directions. The report recommends that the labs and the NNSA agree on the boundaries and roles of their respective managements and “recognize that safety and security systems at the Laboratories have been strengthened to the point where they no longer need special attention. NNSA and Laboratory management should explore ways by which the administrative, safety, and security costs can be reduced, so that they not impose an excessive burden on essential S&E activities.”

The Shank committee said the erosion of trust has been most prominent

at Los Alamos National Laboratory (LANL), where past lapses in safety, security, and business practices have been well publicized. The resulting aversion to risk there has led to a bias against experimental work and greater reliance on computational modeling, Shank says. The report says the distrust has spilled over to affect the NNSA’s relations with Sandia National Laboratories and Lawrence Livermore National Laboratory (LLNL) as well.

“Erosion of trust on both sides of the relationship shapes the oversight and operation of the Laboratories, resulting in excessive bureaucracy governing Laboratory activities at a deep level of detail, including the conduct of S&E,” the report states. It later describes the relationship as follows: “Like barnacles on the bottom of a boat, mistrust accretes and accumulates over time until it compromises performance.”

Former LLNL director George Miller told a 16 February House Armed Services Committee hearing that excessive NNSA oversight is costing taxpayers “several hundred million dollars” each year. And Michael Anastasio, a former director of LANL and LLNL, complained that “a significant risk aversion has developed within the bureaucracy at NNSA” and “has manifested itself in a growing focus on compliance at the expense of delivering the mission.”

“The multiple steps and difficulties