

Thank you, Jason. I also want to greet my fellow former commissioners. Thank you for coming.

This organization and people here have done a lot of work on nuclear waste policy, and I hope that what we discuss today can help further the national conversation on what has been a pretty difficult topic.

As of yesterday, we released a report from the National Nuclear Security Administration entitled "Prevent, Counter and Respond – A Strategic Plan to Reduce Global Nuclear Threats." This was the first time that the Office of Nonproliferation Programs has pulled together in one place what we hope will be viewed as a clear articulation of our programs to reduce the threat of nuclear proliferation and nuclear terrorism.

I also noted in those remarks the connection between nuclear fuel cycle development and nonproliferation. And, of course, our Office of Nuclear Energy is a very strong partner with NNSA in these efforts.

Also, I would note that, to help coordinate, quote, "all things nuclear" across the department, I recently created a DOE Nuclear Policy Council. It's a group consisting of senior program leaders and advisers to address crosscutting issues and long-term planning across the whole nuclear space.

It's interesting; when you think about DOE, we have three undersecretaries: nuclear security, management and performance, and energy and science. And all of them have major nuclear responsibilities. So it's something that just cuts across the entire department.

Now, most of these fuel cycle discussions concerning proliferation risks focus on enrichment and reprocessing, for obvious reasons, as pathways to high-enriched uranium or plutonium approaches to weapons.

But the very back end of the fuel cycle – high-level waste disposal, spent fuel disposal – should also be part of these conversations. In fact, in another paper, in 2003, with John Deutch and Arnie Kanter and Dan Poneman, we presented this connection in the context of fuel leasing as an approach to nonproliferation. Pointing out the evident difficulty that we and others have in addressing nuclear waste disposal, sometimes you don't think about it, but it also limits our options in terms of how we approach the international fuel cycle and nonproliferation questions.

I'm not going to go into it today, but I think many of you know I'm kind of involved in some of those discussions these days with regard to the Iran program, for example. It's fundamentally a question about their developing nuclear power for peaceful purposes, but in that case also having to earn the confidence and trust of the international community in doing so.

Another introductory remark in this context is, of course, as we strive to fulfill the president's call for reducing global carbon emissions –tackling the threat of climate change while providing affordable and reliable energy for our country. Nuclear energy, we remain convinced, will be a crucial part of that energy portfolio, counting today for more than 60 percent of carbon-free electricity in the United States. But again, to ensure the viability of the nuclear industry over the long term, we simply have to address the issue of nuclear waste disposal.

So it really has these two elements: the obvious one in terms of nuclear power advancement, but also in the nuclear security regime. It's important that we make progress in both.

As we address spent nuclear fuel, however, we also must, at the same time, provide for the final disposal of wastes from past nuclear weapons activities. Although there's a far smaller amount of waste, serious challenges – technical, environmental and budgetary – remain.

So to address the twin issues of spent commercial fuel and defense nuclear waste, I want to highlight first the administration's overall approach to commercial nuclear waste management and some elements of our fiscal year 2016 budget request, and then finally make a couple of announcements regarding the road forward along both branches of this waste challenge.

So the administration's 2013 Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Waste lays out a plan to implement a long-term program. It derives from the report of the Blue Ribbon Commission that Jason mentioned, chaired by Lee Hamilton and Brent Scowcroft.

That program begins with the operation of a pilot interim storage facility, advances in turn towards siting and licensing of a larger interim storage facility, and finally calls for progress on the siting and characterization of sites for one or more permanent geologic repositories. Most important, the strategy also emphasizes the importance of a consent-based approach to nuclear waste disposal all along the decision chain.

Now, interim storage is a critical component of the strategy and, in our view, of any nuclear waste management system. Interim storage of used nuclear fuel makes sense for a whole variety of reasons. It offers an opportunity to remove fuel from shut down reactors in the near term. At present, there are 12 different sites where remaining used fuel is one of the last steps, if not the sole remaining step, to releasing the site for other uses.

Interim storage could also enable the federal government to begin meeting its waste acceptance obligations sooner and ultimately reduce our liabilities caused by the delay in meeting our obligations. These liabilities are currently projected to be as much as \$23 billion over the next 50 years, on top of the more than \$4 billion the government has already paid in settlements.

An interim storage facility would also provide the capability to receive used fuel in the unlikely event that an emergency situation arose at a nuclear power plant.

Finally, an interim storage facility would also support a long-term geologic repository by providing flexibility for the system as a whole, potentially providing the capability to package waste for disposal prior to shipment to the repository.

Real progress on the commercial side begins with the development of a pilot interim storage facility with an initial focus on accepting used nuclear fuel specifically from shut down reactor sites. Such a focus would provide an opportunity to build and demonstrate the capability to safely transport and store used nuclear fuel.

A pilot interim site would also build trust among stakeholders, including any potential host community that would give its consent for the facility, as well as jurisdictions along transportation routes and communities with spent fuel at reactor sites.

This approach to a pilot facility was endorsed and put forward by the Blue Ribbon Commission, the administration's 2013 Strategy for Nuclear Waste, and the bipartisan bill that we saw introduced in the

Senate last year. Beyond the pilot-scale facility, the administration also supports the development of a large, consolidated interim storage facility with greater capacity and capabilities that will provide flexibility in the operation of transportation systems and disposal facilities.

I would note that we were very encouraged to see the recent announcement by waste-control specialists WCS for a private interim storage facility. And we were particularly pleased to see that it's supported by the local community where such a facility would be located and by elements of the state's political establishment. This is a positive indication that it is possible to have community and state support, and that a consent-based siting process is the best way to proceed.

To be clear, the proposed WCS facility is not a pilot project. The proposal would be built in stages of 5,000 metric tons, with a total eventual capacity of 40,000 metric tons. As for scale, I'll remind you that Yucca Mountain was put forward with a cap of 70,000 metric tons.

Now, our administration strategy has been based on the idea of a federal facility. But the idea of a privately owned facility is an interesting development, and we think the proposal is certainly worth serious consideration and evaluation, and we will take a hard look at it. This sort of creative solution by a private enterprise with community support might play a very significant role indeed as a part of the overall waste management strategy.

The final aspect of the administration's strategy is moving towards one or more long-term geologic repositories for both spent fuel and high-level defense waste. As stated in the strategy, there is international consensus that geological repositories represent the best known method for permanently disposing of used nuclear fuel and high-level radioactive waste without putting a burden of continued care on future generations.

The Blue Ribbon Commission thus recommended that the United States undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of used fuel and high-level nuclear waste.

I should mention that John Kotek served as staff director of the Blue Ribbon Commission then. In case you didn't know, John has joined DOE as principal deputy assistant secretary in our Office of Nuclear Energy and is doing a great job.

To put it simply, the development of geological disposal is the safest and most cost effective way of permanently disposing both nuclear fuel and high-level waste, as I said.

Now, the Department of Energy's fiscal year 2016 budget request accordingly seeks to make progress across the administration's nuclear waste agenda, with investments both in policy development and long-term R&D leading to the ability to transport, store and dispose of both commercial and DOE spent nuclear fuel and high-level waste.

First, the budget includes \$30 million for integrated waste management system activities, including \$24 million from the waste fund, to support preliminary generic process development and activities related to consent-based siting, storage and transportation. These preparations include site-specific assessments of transportation and fuel handling infrastructure at shut down reactor sites, along with preparations to secure railcars, transportation casks and other infrastructure.

We continue to work closely with representatives of state and tribal governments to ensure adequate preparation for shipments, including training and emergency preparedness. The request also includes \$75.4 million for used nuclear fuel disposition to support R&D to enable storage, transportation and disposal of used nuclear fuel and waste generated by existing and future nuclear fuel cycles.

Within these used nuclear fuel disposition R&D activities, the fiscal year 2016 budget request includes \$26 million for the department to continue to move forward with its plans for a field test on deep borehole disposal, which was another recommendation of the BRC.

The basic idea is that a borehole would be drilled to a depth of approximately three miles with at least two miles penetrating crystalline rock. In our experiment, non-waste-bearing packages would be put in the bottom mile of the hole to demonstrate emplacement methods.

We would also retain the option of drilling a second experimental borehole to be used to examine water flow and other characteristics of the deep subsurface. The anticipated low permeability of rock at this depth, coupled with the long pathway to the surface, make this concept potentially very promising. I'll return to this idea a bit later in my remarks about defense waste.

Finally, the department's fiscal year 2016 budget also includes \$32.5 million to support further the understanding of long-term performance of disposal systems in three main geologic rock types: clay/shale, salt and crystalline rock.

So that kind of gives you the program of relevance to our discussion today that we put forward in the fiscal year 16 budget proposal.

But now let me move on to a couple of new things that we want to add to this program. As I've noted, the Blue Ribbon Commission Report recommended a consent-based approach, also focused on the dual tracks of interim storage and geologic disposal capacity. As described above, the administration's 2013 strategy embraced those core findings, and now we want to move forward with implementation of that strategy.

First, to this end, the department will, moving forward, take affirmative steps with a consent-based process to identify one or more sites for both a pilot and a full-scale facility for consolidated interim storage of commercial used nuclear fuel.

Of course, the development of consolidated interim storage in no way minimizes the need for a permanent disposal capability, and we are committed to advancing development of both interim storage and geological disposal for commercial fuel. But again, what we really want to do now is move the process forward for this consent-based interaction with communities and states to get our storage program going.

Second, let me return now to the department's approach to defense nuclear waste. In 1985, a decision was made to combine nuclear defense wastes and civilian commercial nuclear waste and dispose of them in one and the same permanent repository. The Blue Ribbon Commission suggested that we do a study to reexamine that.

Back then, the decision was understandable. The Cold War still continued, and the production of new nuclear weapons was expected to continue indefinitely. It seemed like a natural choice to combine

defense and civilian wastes in a single repository. But today we face a very different world. History has proved that the assumptions made three decades ago were misplaced, or at least did not reflect the future, which is quite common.

While the Department of Energy continues to maintain our nuclear deterrent, we are reducing, not expanding, our number of deployed warheads to the lowest level since the 1950s. It's been 22 years since the last U.S. nuclear test. And as a result of DOE's Stockpile Stewardship Program, which is nearing its 20th anniversary, our lab directors today understand more about how nuclear weapons work than during the period of nuclear testing.

Also since 1985, there have been significant schedule delays and obstacles to selecting a repository site, characterizing a site, and licensing an all-purpose, permanent site. The long-delayed availability of a repository has driven up costs significantly.

In addition – and really a derivative of that statement about the change in the weapons program – the U.S. is no longer generating defense high-level waste associated with weapons production. Thus, the inventory of defense high-level waste is both finite and known, and frankly, relatively small on the scale of civilian spent fuel.

The amount of commercial spent fuel, as I indicated, continues to grow at roughly 2,000 tons per year. We know also that the volume of defense high-level waste after treatment is going to be very small compared to the total inventory of other high-level nuclear waste and spent fuel.

So it's time to update our nuclear waste policies to meet these new realities.

Accordingly, I'm very pleased to announce that President Obama today authorized the Department of Energy to move forward with the planning for a consent-based, defense-only repository for some of the DOE-managed high-level wastes. A separate repository for defense waste could allow greater flexibility in the selection of a site, and greater flexibility can help keep costs down.

This proposal means that the timelines for disposal of defense waste and civilian nuclear fuel are no longer linked. Some defense waste is also less radioactive, cooler and easier to handle than commercial waste. This means that a defense repository for these wastes would have a simpler design and could present fewer licensing and transportation challenges.

Finally, defense high-level waste streams are heterogeneous, existing in many different waste forms, which could allow for different disposal pathways optimized to those waste forms. Nearly 80 percent of the inventory of defense high-level waste has been or will be vitrified – that is, put into glass – which means that it could be disposed of in a separate repository with a simpler design.

At the Savannah River site, for example, nearly half of the high-level waste has been vitrified, and it could lend itself to earlier disposal in a separate repository with a more simplified design.

At the Hanford site, the cesium and strontium capsules contain approximately one-third of the total radioactivity at Hanford but occupy less than 0.03 percent of the total projected volume of high-level waste at Hanford after vitrification is complete. These individual cylinders are less than 3.5 inches in diameter and less than 22 inches in length, and that does have the suggestion of a borehole shape. So these are very good candidates for deep borehole disposal.

At the Idaho National Laboratory, 4,400 cubic meters of calcine high-level waste, which exists as granular and powdered solids, is currently planned for treatment, but may be more safely and efficiently packaged without treatment and disposed in a borehole or in a defense waste repository. The same is true for granular solids resulting from fluidized bed stream reforming of 900,000 gallons of sodium-bearing liquid wastes that will be treated at the Idaho site.

So some of these wastes, such as the cesium and strontium capsules at Hanford really may be ideal candidates for deep borehole disposal, whereas larger waste forms would be candidates for disposal in a defense-only repository.

The considerations that I just outlined present the opportunity for borehole disposal and for a defense high-level waste repository to be selected, licensed and built sooner. If implemented successfully and in a timely manner, this could also mean reduced ongoing storage, treatment and management costs for wastes currently at a number of DOE facilities around the country. In addition, this process could play an important role in a broad nuclear waste strategy, providing important experience in the design, siting, licensing and development of the facility that could be applied to the development of a future repository for commercial used fuel as well.

To be clear, the administration strongly supports moving forward on a parallel track to address storage and disposal of commercial used fuel. As I already mentioned, we plan to move out in parallel to site pilot and full-scale consolidated interim storage facilities that could accept used fuel from shut down commercial reactors and potentially from other nuclear reactor sites as well.

Although the actual construction of a federal interim storage facility would require new authority, we can make progress towards scoping a consent-based siting process right away. And to reiterate, we are encouraged at the prospect of a privately developed interim storage facility, which would create yet another potential pathway for storage of commercial used fuel.

So to sum up, what we've put forward today are two steps as part of a comprehensive approach to spent fuel and high-level waste origin disposal: First, we will take affirmative steps with a consent-based process to identify one or more sites for both a pilot and full-scale facility for consolidated storage for commercial fuel. And second, the president today authorized the Department of Energy to move forward with planning for a consent-base, defense-only repository and other geological options like borehole for some DOE-managed high-level wastes.

We think these steps are just common sense. We look forward to working with stakeholders in Congress, industry and local communities across the country to ensure that our efforts fully reflect the safest, most efficient and most fiscally responsible path forward.

And again, I'd just thank the Bipartisan Policy Center for your hospitality and your flexibility in inviting us here to address this important topic. Thank you.

<http://energy.gov/articles/secretary-monizs-remarks-look-back-blue-ribbon-commission-america-s-nuclear-future>

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