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NUCLEAR SECURITY AND JAPAN'S PLUTONIUM PATH

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P R O C E E D I N G S

MR. EINHORN: It's sponsored by the Stanley Foundation. Jack Kimball is here from Stanley. I want to thank Jack for his support of this event. We're meeting just a few days after the third anniversary of the Fukushima Daiichi tragedy, and also, a few days before the third nuclear security summit in The Hague.

And part of the focus of this meeting is to consider whether and how these two events are related. Japan has had a longstanding declared policy avoiding the creation of surplus plutonium; the production of additional separated plutonium before there's a plan to dispose of it. Now, already, Japan has about 44 tons of separated plutonium. Most of it is in Europe, where it was reprocessed. About nine tons or so are in Japan.

Before Fukushima, a number of Japan's power reactors were burning, or to put it in another term, consuming some of the plutonium in the form of mixed oxide fuel, a combination of plutonium and uranium. But the Fukushima disaster shut down all of Japan's power reactors to review their safety. And so, the small amount of consumption of separated plutonium that had been taking place is no longer taking place.

And as part of his effort to revive Japan's nuclear industry, Prime Minister Abe hopes to restart some of those power reactors, and several of them may get a green light in the period just ahead from the new regulatory authority in Japan. But even if this small number of reactors does begin to operate soon and begins to burn MOX fuel, they'll only put a small dent in Japan's overall inventory of separated plutonium.

In the meantime, Rokkasho, Japan's large commercial reprocessing plant may begin operations before too long. You all know it's a plant that's been -- it's been under construction for about 22 years. It's been idle for most of that time. It's been a plagued history. Many hope that it will begin operating later this year, perhaps as early

as October or later on, but in any event, the plan is for it to begin operating this year, and when it's in full operation, it has the capacity to produce around eight tons of separated plutonium annually.

So, even if some Japan power reactors come back online and begin to consume plutonium, and this is a question mark, the startup of Rokkasho would add significantly to Japan's existing plutonium surplus. Now, on top of that, the Monju prototype fast reactor remains idle. It's been idle for quite some time.

Fast reactors were once the great hope for meeting Japan's energy security needs, addressing the plutonium surplus and dealing with the problem of spent fuel. But that hope has long since faded. Commercializing fast reactors still decades away.

Japan's plutonium policies also have implications outside of Japan. China and South Korea have begun publicly criticizing Japan's large stocks of separated plutonium. They say those stocks raise suspicions about whether Japan plans to turn those weapons' usable stocks into a large arsenal of nuclear weapons. They also voice concern about the vulnerability of those plutonium stocks to terrorist groups.

Now, my guess is that these recent Chinese and South Korean criticisms have more to do with the bilateral difficulties between those two countries and Japan than they have to do with those countries' security concerns about the separated plutonium, although I'm sure there is a residual concern about the security implications. But I think it's basically a function of the difficult bilateral relations these countries are going through.

But I think these criticisms are an indication that international attention to the plutonium problem of Japan is unlikely to decrease anytime soon. And international concerns about separated plutonium in Japan are not confined to Chin and South Korea. Reportedly, the United States has raised serious issues with Japanese authorities about

security practices at some Japanese facilities.

And of course, the surplus plutonium issue is just one part of a much broader debate over the future of Japan's nuclear energy future. The debate addresses such questions as the future of Japan's longstanding reprocessing and plutonium recycle policy, as well as the challenge of dealing with the growing spent fuel management problem in Japan.

And of course, it addresses the most fundamental question. Should Japan, one of the world's leaders in nuclear energy, continue to rely heavily, if at all, on nuclear power? And we hope today, to touch on all of these issues. And with us today are some experts who spent a lot of time thinking about this problem, and I'd like to welcome them, introduce them briefly.

I think you have some materials to describe them in greater detail. We have Douglas Birch, former Moscow bureau chief for Associated Press who is now a senior national security reporter for the Center for Public Integrity. Jeff Smith, former editor and foreign correspondent at Washington Post, and is now managing editor for national security at the Center for Public Integrity. Matt Bunn, a professor at Harvard's JFK School. He spent a lot of time thinking about fissile materials, was a former senior government official, and I guess was leader at the Project on Managing the Atom for many years, and is an authority in this field.

And then finally, a good friend and colleague, Ambassador Nobuyasu Abe, who has had a distinguished career in the Japanese foreign ministry, was my counterpart for a number of years at the Guymusho. He is now a director at the Center for the Promotion of Disarmament and Non-Proliferation at the Japanese Institute of International Affairs.

And if rumors are accurate, he will soon be appointed as a commission

of the Japanese Atomic Energy Commission. So, to start us off, I'd like to ask Doug and Jeff to come up. They have a presentation for you.

MR. BIRCH: Yes, I'd like to make one correction to the introduction. We were called experts. I'm not holding myself out as an expert, but I am journalist with 30 years' experience, and last year, when Jeff Smith asked me to do this story, he basically had two questions for me.

He said, there is this -- Japan is opening this new plutonium production plant. And why are they doing that, at a time when they have 44 tons -- when Japan has 44 tons of plutonium already stockpiled in Europe and at home? And number two is whether the material is safe; whether we have to worry about the security of this material falling into the hands of terrorists.

So, that was my mission. And as part of that mission, I went to Japan in November. I talked to many, many people first, but then I went to Japan in November and I visited several of the facilities, including Rokkasho. So, that's what I'm going to talk -- I'm going to focus on that today, and here we go.

Japan was an early adapter of nuclear power in the 1950s, at the urging of the U.S., as Jeff will talk about a little bit later. And its enthusiasm, I think, reflects a number of things, but one of them was its very unfortunate experience during World War II. So, I just wanted to have that.

Here is the Rokkasho plant. It's located on the northeast -- sorry, yeah, the northeast section of the main island of Japan, where Tokyo is located. It's about a thousand miles north and it's huge. It's about a square mile. It took, as Bob said, I think 22 years to build, and it cost $22 billion. It is about a square mile wide and a couple of dozen buildings altogether.

I arrived there in November, and the Japan Nuclear Fuel Limited, which

is the owner of the facility -- they were very nice about giving me a tour. So, the current concerns about Rokkasho are that obviously, that plutonium can be used to fuel both nuclear power plants and nuclear weapons. I mean, that is the main concern. That is why everybody is worried about it. I know most of you know that already, but some of you may not.

But International Atomic Energy standards, eight metric tons of fuel, of plutonium, is enough to build a thousand bombs. I mean, that's very rough. You can argue those figures, but if you do some simple arithmetic, that's what you come up with. Thomas Cochran, a physicist with the Natural Resources Defense Council and Christopher Paine have separately calculated that you could more than double that number with a sophisticated program. So, this is the concern.

As Bob mentioned, there is -- the Rokkasho can produce eight metric tons of plutonium a year, and the question is -- let's see. But the problem is, I guess I'm stepping -- I'm treading in the footsteps of Mr. Einhorn, but none of Japan's commercial reactors is currently open. All but one of them are standard light water reactors designed to burn uranium.

The one exception is Munju, which is a fast breeder -- a demonstration fast breeder reactor. That reactor has been closed for all about nine months since 1995 because of accidents and other issues. There doesn't seem to be -- there is little likelihood that Japan will be able to burn eight tons of plutonium a year, if it opens Rokkasho. It will only be able to burn a fraction of that amount, probably.

So, again, why go to the trouble and expense of opening Rokkasho? And this was a question I put to a lot of different people, including Matt, and he may talk about it. Before I get to that question, I'm going to describe my tour a bit. Oh, actually -- first of all, this is a map of reprocessing plants -- major reprocessing plants. The one in

the U.S. is H Canyon at Savannah River, which was a former weapons plant, which is now used for a variety of purposes, and it was intended -- it may be employed as part of the effort to turn U.S. weapons plutonium into MOX fuel.

But the others, you can see that the major ones are all up there. They're in the France. The bluer are commercial. The red are military. That red one over South Korea is not South Korea, by the way. That's China, just to make sure that you don't get confused. I'm sure the South Koreans would not like that, and we wouldn't like it, either.

Here is a graph of the plutonium holdings of the top five countries. These five countries control almost all of the plutonium -- all the 490 metric tons of plutonium that exist in the world. Russia, as you can see, has the most with the United Kingdom and the United States, France, and finally, Japan coming in fourth. Japan is the only -- obviously, the only non-weapons state in this group, and it's the only one -- well, it's the only non-weapons state in the group.

Now, this is the control room at Rokkasho. It's one of the stops. Let me just describe my visit there, which was -- well, first we went to the visitors center, and from there, we went through a portal. There seems to be one portal into the place. There was a very -- an elderly guard came up to me, and he bowed, and with his gloved hands and his uniform, he asked me for my passport, which I thought was a wonderful moment. I mean, the Japanese are incredibly polite people; I found them to be, anyway. And that was kind of my introduction to the plant.

Once we came in, we drove through this maze of fences and a grid of different -- of these huge buildings. I mean, it's a gigantic facility. It's obviously a tremendous amount of effort and money has been poured into it. We went to, first of all, the control room. This is Tomonori Iwamoto and he is a wonderful guy, and he also was a former weapons inspector in Iraq. He's the head of the nuclear security and

safeguards at Rokkasho, and was my main guide on the tour.

As we went through -- I don't want to talk too much about the details of what I was told and saw. I was told and saw a lot more than was in the story, and I don't want to get into -- again, I don't want to go too far beyond that, because I know this is a sensitive issue. But let me just say that there were radiations portals. At entrances to buildings, there were computerized identification systems. There were five inch thick steel doors. A lot of very impressive physical barriers that I don't think I've ever seen in any facility.

But in terms of the physical protection, in terms of guard force, I didn't see -- all of the guards that I saw were not armed. The one I did -- there is a small police post at the facility. I did not go into it. I don't know what's there. I don't know what exactly they have, but I have an understanding that there were armed forces at the facility, though not necessarily within the actual plant itself where the reprocessing takes place.

The U.S. has long been concerned about guard forces and the insider threat. These are the two main issues that the United States has been concerned about at Rokkasho. And this is the one that we've been told that the U.S. has, in the past, raised -- these are the issues that the U.S. has raised with the Japanese officials.

I saw the high level waste facility there. I saw the central control room, and I also saw the spent fuel storage area and a high level waste storage facility. All were again, physically very -- they had very impressive physical barriers, but -- and I was told that there lots of electronic -- there was lots of electronic protections, as well. The Rokkasho is one of the -- I guess it's the only facility of its size that is under IAEA safeguards. So, those are all the steps they've taken to secure the facility.

How safe is Japan's plutonium? That's a good question. What is

different about plutonium is that it's a nuclear explosive, and no matter how well guarded a nuclear material is, there is no guarantee it cannot be diverted or stolen. Japan's society sees so little violence at -- many people there that I talked to, had a hard time imagining that terrorists could try to seize nuclear explosives. It just wasn't something that seemed to be possible to some. Not to all, but to some.

Japan does not have the kind of specially trained, heavily armed guard forces that U.S. nuclear power plants have, and that's obvious. Whether they're needed or not is the question. Nor, according to officials that we talked to, are employees at nuclear sites required to undergo formal criminal background checks. Now, this is a bit of a squishy topic, because I understand that there are informal background checks that are conducted at some facilities under some conditions, but overall and in general, there are no required mandatory, formal criminal background checks or other background checks.

Japan is considering requiring more stringent checks -- these background checks, but because -- and that's -- the new nuclear regulation authority is considering those. They are supposed to announce this month what their plans are to heighten that security.

There are no plan to arm guards at these facilities -- arm their regular guard forces, and Japan has decided that's not -- that it's something it just simply cannot do. And that has been a concern for some within the U.S. security community. So, it may be that Japan's security measures are sufficient to guard its plutonium; terrorist attacks on nuclear facilities are rare.

This is a low risk, high consequence event. Sometimes, the improbable happens. An act of nuclear armed terror could kill hundreds of thousands of people, disrupt global trade and have massive unforeseen consequences. So, the question is, is can Japan take this chance, and can the rest of the world take the chance, as well?

I think I'm going to let Jeff talk, because I think I'm sort of -- I have much more on my papers, but I'll just let someone else come up and take it from there. Thank you. (Applause)

MR. SMITH: So, I'm going to speak about the American government's attitude regarding Japan's nuclear energy program, and in particular, the Rokkasho plant. As you will see, Washington's enthusiasm for it has waxed and waned, but mostly waxed. Our first engagement with Japan on nuclear energy came after the end of America's war with Japan, at the beginning of the period when America was eagle to promote and sell its nuclear reactor technology everywhere around the world.

U.S. officials faced a steep political challenge. How could they nourish a passion for nuclear energy in Japan, a country devastated by the dark underside of atomic power? The answer, according to the CIA, was to embark on an enlightenment propaganda program, part of an atomic peace mission that would spark an appetite for nuclear reactors. One of its key targets was the owner of the Yomiuri Shimbun newspaper, who became an avid of nuclear technology, who promoted heavily through his newspaper interests, and went on to help found Japan's Atomic Industrial Forum.

Beginning in 1966, Japan started building about one reactor a year, which as my colleague has mentioned, were meant to stop gaps until the country was able to create a new energy system based on advanced breeder reactors. That plan was supported and encouraged by the United States, which helped supply uranium for the early reactors, and also shipped weapons grade uranium and plutonium to Japan for nuclear fuel studies at a research center known as Toki.

Then, in 1977, the Carter administration reversed U.S. policy on the grounds that India's -- based on India's use of plutonium for its first nuclear explosion and the fact that breeder reactors, involving as they do, a stream of plutonium fuel moving

between factories and burners around the globe, if they were widely adopted, posed a dangerous nuclear proliferations threat.

So, Congress wound up killing the U.S. breeder program, partly due to cost overruns, but its supporters in Japan persisted. So at Tokyo's insistence, the Carter administration agreed to let Japan produce new plutonium for fuel, but required that it get permission each time it did so. The objective was obviously to limit Japan's overall stockpile of plutonium.

Then, in 1982, in a secret national security decision directive, President Reagan offered advanced consent for any plutonium production Japan wished to do. Japan started building the Rokkasho plant in 1993, and while it was supposed to be finished in four years, it's taken 21. And in the intervening time the 9/11 attacks, newly sensitized washed into the risks of nuclear terrorism.

And under government pressure, the guard forces at U.S. nuclear plants grew by 60 percent. Washington also asked France, Britain, Russia, China, Japan to undertake similar security improvements at their own nuclear facilities. But Japan resisted for the most part, with the result that the principle utility paid security forces at nuclear facilities around that country are unarmed, and as my colleague just mentioned, detailed background checks are not conducted on plant workers, officials, engineers -- those with access to the dangerous fissile materials.

We found plentiful evidence of U.S. frustration about this in diplomatic cables and in interviews, including some with Obama administration officials. Kevin Bayer, the chief science and technology officer at the U.S. Embassy in Tokyo from 2001 to 2005 said that when he and White House homeland security advisor, Frances Townsend met there in 2005 with a senior official at Japan's Nuclear and Industrial Safety Agency, we told them, your nuclear power plants are very good targets for

terrorists, and that security urgently needs to be tightened.

Bayer told us that the official said there is no threat from terrorists, because guns are illegal in Japan. Bayer said Townsend turned to him and asked, is he joking. The officials view, he said, was widely shared within the Japanese government. That's what we were up against. Townsend, in an interview, confirmed the account and said her impression was that the Japanese thought of themselves as very much isolated from this particular threat; that it was an American concern that didn't touch them.

U.S. concerns were also stoked when Japan invited an embassy official to witness a massive security drill in 2006 at their Mihama reactor meant to practice how the government should respond to a North Korean mortar attack meant to release a cloud of radiation. The officer's cable back to Washington cited what he called a typical police presence consisting of up to six officers in a single lightly armed vehicle, some of whom were fast asleep.

Like all such drills, the exercise followed a tightly written script, and it lacked any force on force exercise like this required and routine in the United States. Two days later, when U.S. charge d'affaires, Joseph Donovan, expressed his own broader concerns to two deputy safety directors at the Japanese Science and Technology Ministry, they responded that contract guard forces at Japan's nuclear facilities are prevented by law from carrying weapons, according to a confidential cable he sent to Washington.

When he specifically challenged the absence of armed guards at a Japanese research center, the Toki Center, stocked with plutonium and weapons-grade uranium, the officials responded that an assessment of local needs and resources had indicated that there was not a sufficient threat to justify armed police there, according to the cable.

The situation has hardly improved since then, a senior Obama administration official said in an interview with us. He spoke on condition of anonymity, due to the sensitivity of these diplomatic discussions. But the official said it's a system that relies heavily on the expectation that everyone will do what they're expected to do. The stuff we would kind of expect to see at a dangerous nuclear facility is not there.

He went on to say the devastating accident at Fukushima showed that police and lightly armed Japanese Coast Guard forces play a secondary role in the security and safety emergencies to private unarmed security guards. The Japanese government, he said, is heavily dependent on what the utilities decide to do.

For a decade, this official said, this United States has urged Japan in a friendly way, in a non-threatening way to elevate their understanding of the threat. Do they have the weapons and defensive systems that we have at nuclear facilities? Almost certainly not, the official said. Instead, Japan has treated the security of their nuclear facilities as more of a law enforcement task than a quasi-military mission.

History so far, hasn't proven them wrong, the official said, but you have to ask what level of risk are you willing to accept? I should probably that we talked to Naoto Kan about this. As you may know, he held a series of top governmental financial and strategic policy positions before becoming Japan's prime minister from 2010 to 2011, representing the democratic party of Japan, the LDP's main rival.

Before the disaster, Kan said, he had debriefed some officials within the nuclear and industrial safety agency who had traveled to the United States to discuss the terror threats to nuclear plants. NISSA, this agency, since abolished, was part of the powerful ministry of economy, trade and industry, a bastion of support for the nuclear industry.

Kan said that NISSA officials returned from their trip unimpressed, telling

him they concluded that America might be under terrorist attacks, but Japan is very unlikely to be so. Therefore, Kan said, NISSA felt it wasn't necessary to take the threat of terror attacks on nuclear facilities seriously.

He said this attitude was widely shared in the industry and government. "Japan simply didn't consider terrorism a possibility here," he said, "and as a result, Japan almost entirely ignored the advice of the United States after 9/11." And he said, "And you may ask whether Japan is prepared for such threats. Well, the answer is that it isn't prepared for such threats."

It's important for me to note here that Washington has not told Japan it should not open Rokkasho. One reason why Washington hasn't offered that advice, we have heard from many officials, is that killing it and all future nuclear power plants linked to it would increase Japan's dependence on traditional energy supplies and drive up their price in the world market, adversely affecting the United States economy. Moreover, as Jon Wolfsthal, a non-proliferation expert on the staff of Vice President Joe Biden and on the staff of the White House National Security Council during President Obama's first term told us, many of the administration believe that Japan wouldn't listen to pleas for cancelling Rokkasho, and that insisting on it would only fracture U.S. relations with the country.

Instead, the United States has genuinely urged Japan to cap or reduce the size of its plutonium stockpile and its officials, such as Deputy Energy Secretary Daniel Poneman, have encouraged Japan to reopen its closed reactors in part, so that any newly created plutonium can be burned at the same rate it is being produced. They've also pressed Japan to give up through repatriation to the United States, some of its existing plutonium stocks before production gets under way.

Underlying U.S. concerns about the size of Japan's plutonium stockpile

is a worry that this issue might wind up stoking tensions between Japan and some of its neighbors such as China and South Korea. Why? Because creating a large plutonium stockpile gives one a latent significant nuclear weapons capability, something that Japanese officials frequently refer to.

There's a pro-nuclear power plant argument, said Japanese parliamentarian Taro Kono in an interview with us; that we need to keep the nuclear reactors running so that we can pretend that we may have a nuclear weapon one day. Now, as everyone here knows, Japan has a pacifist constitution and a 47 year old policy of ruling out the production, possession or introduction of nuclear weapons on its soil.

It has signed and ratified the non-proliferation treaty; is a leading advocate nuclear arms control. Moreover, all of Japan's existing plutonium stockpile is under International Atomic Energy Agency safeguards, while its uranium, a lynchpin in any effort to restart the country's civilian reactors, is largely imported. That, of course, gives the rest of the world some leverage over what Japan decide to so.

But a potential linkage between Rokkasho's product and nuclear weapons has hung over the program from the start. A gentleman named Kumile Konecko, a 76 year old former director of the nuclear energy division at the Ministry of Foreign Affairs told the Center for Public Integrity that Tokyo pressed the Carter administration in 1977 for permission to start producing plutonium, partly to ensure that Japan had a weapons option.

We concluded that Japan should not build nuclear armaments while leading the ability to do so, said, Konecko, who retired from the ministry in 1982 and is now directing a foreign ministry affiliated think tank. Naoto Kan similarly told us the desire for nuclear weapons capability is an important source of support for Japan's plutonium programs.

Inside Japan, and that is not only within the democratic party of Japan, there are entities who wish to be able to maintain the ability to produce Japan's own plutonium, Kan said. They do not say it in public, but they wish to have the capability to create nuclear weapons in case of a threat.

Gary Seymour, who directed nuclear proliferation policy at the White House during Obama's first term put it this way in our interview with him. If the Japanese government really decided yes, we're going to turn it on, turn on the Rokkasho plant, then the Obama administration would have to make a decision, he said. Either the United States will have to stick with the existing policy, which is not to object, or we'll have to try in earnest, and for the first time, to persuade Japan to abandon its plutonium manufacturing plan.

Thank you very much. (Applause)

MR. BUNN: Good afternoon, everyone. Thank you for coming. And I'd like to thank the Center for Public Integrity and the Brookings Institution and Stanley Foundation for putting this event on.

I'm going to talk about both the fuel cycle aspect and the nuclear security aspect, which are, to some extent, linked. And I think I may tell a somewhat better news story than my colleagues have been saying so far. First of all, it's my view that Japan's people and Japan's government need to be the ones to make a choice about direction to pursue on nuclear energy and on the fuel cycle.

And the U.S. government's position should be that as an ally, we're prepared to help with whatever choice Japan makes, and help them implement it in a way that serves both Japan's interests and our interests. So, first of all, whatever choice Japan is going to make on the nuclear fuel cycle, it needs to be done in a secure way, for both of our interests. And Japan is already making significant progress on improving

nuclear security in recent years.

We've heard about the armed guards that now are in place from the national police forces. The unarmed ones are the ones that are employed by the utilities themselves, but the armed forces were put in place after the 9/11 attacks. Just in the last couple of years, Japan has expanded the protected areas near nuclear facilities and imposed a number of other improvements in nuclear security rules.

Seeing what happened at Fukushima, they have, I think, in a way better than a number of other countries, seen that that -- while that was a safety incident, it teaches us security lessons, as well. And that if terrorists were able to disable the power and the cooling systems at a nuclear power plant for an extended period, it could cause a release comparable to what we saw at Fukushima.

But as we've heard, they still have a way to go. I think I would like to see the background checks being put in place as soon as possible. I think it's just odd to have a situation where people with direct access to the essential ingredients of nuclear weapons haven't had any background check. I have clearances in the United States, and to me, it's just routine having people look over my criminal record and my bank accounts and my psychological past and so on, so maybe I have an undue laxness about such things.

But there are a number of people in Japan working hard to make that happen. I would like to see, beyond background checks, a number of steps for better protection against insiders. Like a number of other countries, Japan has focused more on safeguards which are international inspection and less on the kinds of things that are important for whether one or two or three employees might be taking something or sabotaging something, or what have you.

I'd like to see the armed guards more fully integrated into the security

plans for the site, and have somewhat higher capability, and I'd like to see the force on force exercises really getting going in a realistic way. These are tests where you see whether the security system really works in the face of creative and clever people trying to find its weak points and overcome it. But in all of those areas, there are people in Japan trying to make that happen and working to make that happen.

There is especially a need, of course, for good security for plutonium facilities and bulk processing, in particular, where you're handling large quantities of this material. That makes it more difficult to prevent somebody from squirreling away a little bit of it at a time. And in fact, almost all of the real thefts that we have seen of plutonium and/or highly enriched uranium, all but one have been in the form of bulk material that appears to have come from some kind of bulk handling facility.

I think that taking these kinds of steps would be in Japan's interests. I think that although Japan does face a much lower threat in terms of terrorism than the United States does, the reality is, in an age of global terrorism, there's no country that's so safe that the essential ingredients of nuclear weapons shouldn't be secured to fairly high standards.

I would note, in Sweden a couple of years ago, they had a remarkable theft -- not a nuclear theft, but just a theft of cash, where the robbers arrived in a helicopter; they had automatic weapons, explosives, rocket propelled grenades. They had explosives to blow through the security doors. They had left a bag at the police heliport labeled bomb, to prevent the police from taking off quickly, which was successful. The police took about 45 minutes to determine that it wasn't, in fact, a bomb and get their helicopter off.

They had spread what are called caltrops, little spiky things on the street all around the building in order to prevent police vehicles from arriving, and they made off

with millions of dollars in cash. And what's interesting about that, you think of Sweden as a fairly safe country. This was primarily a Serbian gang, so they'd come from half a continent away.

So, this is the kind of thing one has to worry about in this age of globalization that we live in. And I think this is important to Japan's leadership in non-proliferation, in arms control, and in nuclear power. Nuclear power is not going to grow unless people see it as a safe and secure way of generating electricity.

Now, part of this has to be a real focus on this non-accumulation of plutonium policy. In the past, they have had this as a policy, but not really as a reality. The nine tons that are sitting physically in Japan have largely accumulated since the policy of non-accumulation of plutonium was first enunciated. I fear that we will, again, have a situation where utilities have to announce plans for how they will use the plutonium, and they will announce plans, and those plans will be entirely fictitious and the plutonium will continue to pile up.

There is one Japanese utility, for example, that has already fabricated MOX fuel sitting in its pool, that has been sitting there for 10 years, waiting for adequate public acceptance to load that fuel into the reactor. So, even if once the reactors begin operating, it's not at all obvious that the public acceptance from the local communities will be there to use MOX on a large scale.

So, I would argue that Japan -- one possible approach it might consider would be to say, we won't separate any more plutonium this year than we used last year, rather than basing it on what we hope to use in the coming year, so that in the net, you'd be declining, or at least not going up over time.

An even more stringent idea that some Japanese colleagues and I put forward a decade ago was, whatever the trace of the fuel cycle, let's not separate the

plutonium until we need it. If we have plenty of plutonium already, no need to separate any more. If that were the policy, then there wouldn't be reprocessing in Japan or in a number of other countries for quite some time to come.

So, however, in Japan's nuclear energy picture, everything is linked to everything else. So, I believe it's in Japan's own interest to move towards dry cask storage of its spent fuel. But in order to make that happen, it requires a very comprehensive solution. Dry casks offer a technology that leaves all options open for the future. They allow technology, economics, politics, to evolve and develop, so you can make the best choice when the time comes. It doesn't lock you in to either reprocessing or direct disposal of the spent fuel. And they're a cheap, safe, and secure alternative for managing spent fuel.

So, the first step to do that would be, I think, to go to the communities where these reactors are located, who have been promised that all of that spent fuel is going to be moved away, and say, we're going to take a number of steps to make your reactor as safe as it can possibly be, and one of those steps is, we're going to take a lot of the spent fuel out of the pools that pose such a risk at Fukushima and put them in much safer dry casks, as the head of the new nuclear regulatory authority has suggested would be desirable.

Secondly, there needs to be something for Aomori prefecture. It's a very poor prefecture. A lot of the jobs and taxes are coming from this plant, and they don't want to be just a spent fuel dumping ground or a nuclear waste dumping ground. I would envision shifting Rokkasho to be a major R&D center on nuclear energy, fuel cycle technologies, safeguards technology, while establishing another major stimulus project in the area to bring in jobs with government financing. So for example, I could imagine partial government financing of an electric vehicle manufacturing facility, just as one

potential example.

Third: In addition to the localized dry cask storage, it would make sense to establish a centralized -- expanded centralized capability for dry cask storage. In particular, there needs to be some place to store all the Fukushima fuel.

Fourth: Expand work on citing and building of repository. People won't accept dry cask storage if there doesn't seem to be any movement toward a permanent solution for this spent fuel. But the repository really needs to be shifted, I think, to have the flexibility to hold either high level waste or spent nuclear fuel. There would certainly be some damaged nuclear fuel that isn't ever going to be reprocessed.

I think that it would make sense if Japan feels a concern about energy security to buy a substantial stock of uranium, which is cheap and easy to store; it doesn't take up very much space, for that purpose. And I think one thing that's clear is that the vision of energy security coming from plutonium is not coming true.

Fukushima made clear that nuclear energy, in and of itself, doesn't offer much in the way of energy security, because if energy security means anything, it means that your energy's picture can't be greatly disrupted by events beyond your government's control. And certainly, that's what we saw at Fukushima. But even on plutonium particularly, we saw already that the MOX program was disrupted for years and years by safety faking of tasks over in Britain, which Japan had no control over whatsoever. So, there's really no energy security to be had on the plutonium path.

Now, all of that being said, it is Japan's choice. I'm merely trying to offer some friendly advice. I again, think that the U.S. government should be supportive and willing to help with whatever path Japan chooses for its nuclear future.

I should mention, we have recently put together a large amount of material about nuclear security that's available -- including about reprocessing and

plutonium -- it's available on our web site called nuclearsecuritymatters.balforcenter.org. There's a few fliers for it out there, and you can find a lot of information there. Thank you. (Applause)

AMBASSADOR ABE: My name is Nobuyasu Abe. Thank you for your kind introduction.

As he mentioned, I will be probably assuming the position of commissioner on the Japan Atomic Energy Agency. But today, I am still director of the Center for the Promotion of Disarmament and Non-Proliferation. So, what I will say today is my personal view as director of the center, and not in any way as a commission of the Atomic Energy Agency.

I have been discussing this question of what to do with the reprocessing in Japan in a number of study groups, and perhaps, in the Atomic Energy Commission that I will be working for, this will be one of the major issues I should be dealing with, because as Bob mentioned, the Atomic Energy Agency, years ago, pronounced a policy for Japan not to possess any excess plutonium, which does not have any clear utility for Japan. And therefore, the commission will be sort of its own guardian with its own policy declared. So for that reason, I should be working on the question.

I am also a bold member of the WINNS, the World Institute for Nuclear Security. And in that capacity, as well, I have been working on promoting the need to work harder on the question of nuclear security and the measures against potential nuclear terrorism. Therefore, there are a number of questions raised about the lack of security in Japan. That's exactly what I have been working on and I will be continuing to work on, so that I don't touch on that question.

Many things were said about the reprocessing question and the Japanese nuclear situation, so I won't go over them. But let me raise two points briefly.

One thing is, almost everybody says Japan has 44 tons of plutonium separated. Before I came here, my foreign ministry friend gave me some material -- kindly gave material to me. It says Japan has 23 tons abroad and 6 tons at home, combined 39 tons -- a lot smaller than 44 tons.

SPEAKER: That's the fissile plutonium.

AMBASSADOR ABE: Right. You're right.

SPEAKER: Forty-four in total.

AMBASSADOR ABE: You are a scientist. You're an expert (Laughter).

I have to tell you, I am a political science major. I'm not a scientist, so I don't claim to be knowledgeable about all of the nuclear physics. But this is an important point; 44 tons by weight of mass of the separated plutonium. But when you count fissile plutonium, which is isotope 239, 241, that sort of plutonium that can explode is 39 tons.

So, why do I mention it? That's one of the contentious points of debate. Years ago, there was a famous ambassador in my debate, and the IAEA in Vienna -- the Japanese ambassador at that time, Imayi argued with the kind of reactor grade plutonium that Japan may produce, you cannot make a bomb.

And Americans came out, no, no, you can make a bomb. And therefore, it is dangerous and you should not be doing it. It was a debate for some time. Eventually, Professor Imayi lost the debate, because Japan has no way of proving certain plutonium, you can make bombs with, because we are not supposed to make a bomb (Laughter). We're a non-nuclear weapons state under the NPT. Americans know, because they have tested -- they have tested many kinds of bombs with the uranium plutonium. So, when they said you can have an explosive bomb, there's no way the Japanese can refute, so they lost the debate.

But anyway, as I discussed this question in a number of places, I came

back with questions to ask Americans overall. After all, what is the problem? Is that the quantity of the plutonium that Japan is possessing and producing? Is that the problem?

Then, there are certain ways you can keep the amount constant or you can reduce. Or, is that the quality of the plutonium that Japan is possessing or producing? Then, the questions comes whether it is a weapons grade or a reactive grade, or even less.

The recent report about the Japanese possessing something like 300 kilograms of weapons grade plutonium, yes, that was given to Japan in the 1950s for research purposes. The news report said that Japanese hesitated to give it -- turn it back. Well, after some time, it seems that Japan is going to agree to send it back to the United States. So, that will be solved.

But anyway, tons of plutonium will be there. If it is -- the biggest concern is quality, then there are some ways to get around. You may degrade the quality of the plutonium, so and so. Or, is it a question of physical protection? That means, do we have tough enough walls of protection or armed police, armed forces around? Is that the question? Is that the major question? Then, there are some answers to that.

Or, is that the question of willful, intentional diversion of plutonium to make bombs? Some say they are concerned. In that respect, there's another point I may have to refer to some of the things mentioned. Yes, there are some people in Japan -- General Tomogami, a few other politicians who say it is good that Japan keeps an option to make bombs. And some even say for that purpose, Japan should open Rokkasho.

I think they are totally wrong. If you are going to make a bomb with plutonium, you don't get the plutonium from Rokkasho. It's second grade plutonium. A country that produces Lexus, produces Sony doesn't try to make a bomb with that kind of

plutonium. They go the other way. The better way to make bomb-grade plutonium is to use graphite reactor or heavy water reactor. That's why we were so concerned about the North Korean graphite reactor. That's why people are concerned about the heavy water reactor Iranians are trying to build, because they are the best reactors to produce weapons grade plutonium.

Or, is it a question of technology proliferation? Japan is trying to master the technology to separate plutonium. With that knowledge -- that knowledge may be unintentionally diverted or stolen by some other country who may try to get the bombs. Is that a concern? Then, there are some ways to prevent them. Okay.

Other concerns, American concerns -- which one is the greatest concern? I give you a gold axe. Some from a children's story. But with a gold axe, you can only achieve one wish. Okay? Which one do you pick up out of the five questions I put; the quality, quantity, physical protection, diversion or proliferation? Or, if you still say all of them (Laughter), that makes things more difficult.

But I am still discussing learning and thinking what would be the best answer about this question. But to come out with an answer, you have to overcome a number of problems, as had been mentioned. One thing is that -- well, for example, the previous democratic government in Japan decided to abandon the Rokkasho reprocessing plant.

Prime Minister Kan, Prime Minister Noda said that Japan should eventually go out of a nuclear pod generation. And they came to the conclusion that if that is so, we don't need the reprocessing plants. They announced their decision to abandon the Rokkasho. A few days later, the governor of Aomori came in. Okay, if that is your decision, you don't -- you're not going to reprocess this spent fuel stored in Aomori. That means they will stay there forever. Aomori cannot accept that. Please

take all of that away. Then, the democratic government had to step back, because there's no way you can replace that. So, that's one big hurdle.

Another hurdle may be, the company which built Rokkasho spent more than $20 billion. It's a sort of consortium of all of the power companies in Japan. But at the moment you decided to abandon, that becomes a bad asset, and you have to write off that -- over $20 billion of investments. What do you do with it?

Another big question is, if you don't reprocess spent fuel, that means spent fuel will be -- will continue accumulating, and you don't know what to do with it. Matthew Bunn suggested to have a dry casket -- to keep it as they are without reprocessing. That is promoted by Professor Suzuki, current commissioner of the Atomic Energy Commission.

But he (Inaudible) a problem. Even to find a place to build a storage for dry cask, non-reprocessed fuel, which is more voluminous than processed high level waste, you have to have some locality that accepts the location. It's very difficult in Japan to find any local community which is ready to accept it. So, that's another hurdle.

So, all of these hurdles have to be overcome. And as of today, I don't have any good, clear answers to these questions. And I will be very interested in listening to your advice and the priority you may give. That's how we are today. What will be likely happening in the next few years would be, as of today, we don't have any reactors in Japan in operation.

We have 52 -- excuse me, 50 reactors remaining after Fukushima, but they are all idled. They have 17 reactors under application for restarting, but it is reviewed by a newly established nuclear regulatory commission which has established very stringent safety requirements, which they claim are the higher standards in the world, which is taking time. We don't know how soon they will be put back into operation.

Very likely, some of them may be allowed to operate, but not as many as 40 or 50 of them. Japan also now has a law which says basically, the nuclear reactors have to be put out of service after 40 years of service. That's a law. It has an exemption clause which says in an extraordinary case, you may have permission to operate longer than 40 years. But if that is so, in my calculation, in 20 years' time, theoretically, there will be only 12 or 13 reactors that can be allowed to operate.

So anyway, unless you build new reactors or unless you give very generous permits to extend your life span, the Japanese number of reactors will steadily decline. And with that, what that means is there will be less spent fuel to reprocess, and also, less MOX fuel burning reactors, even among those 10 or 20 reactors that may be allowed to operate.

So, there will be reduced requirements for Rokkasho to reprocess. So, Rokkasho is not going to operate in full capacity to reprocess 800 tons a year. I think at any rate, they would have to operate partially, in partial capacity. And that is likely to happen. And also, that is necessary in order to keep the plutonium balance at least equal, not increasing. And that's my projection.

And with that, let me finish and then open it to discussions. (Applause)

SPEAKER: While the -- you can all hear me? While the other gentlemen are getting miked up, let me raise a question.

It seems to me, there are different levels of concern with some of Japan's nuclear energy policies. The one level that we have been discussing most today has to do with security, and the excess of plutonium, and the just inability from here to see any prospect of drawing down that surplus in a reasonably brief amount of time.

If you deal with that problem, then you kind of -- you solve the problem with the nuclear security community. But then, there's another level, and that has to do

with the use of plutonium recycle; the separation of plutonium and the reuse of it in the nuclear fuel cycle.

And you know, there are solutions to the first problem that don't solve the second problem. You continue to separate plutonium, but that's okay, as long as you consume it at an adequate rate. But if you can solve that problem, you resolve a lot of criticism by other people. But then, you kind of deep down -- go deep down much deeper to the whole question of nuclear power, nuclear energy in Japan. And I've seen polls of the Japanese public suggesting that there's suggest like you know, 80 percent of the Japanese public that would be happy to do away with nuclear power altogether.

But if you ask another question a few minutes later, that if this would lead to an increased cost of living because of the importation of fossil fuels to meet critical energy needs, would you support this? And the answer -- you get a more ambivalent answer. So, you've got kind of different levels of issues that come at this problem.

But I'd just like to ask you about the second level problem. The reprocessing and plutonium recycle problem. I've asked many Japanese officials, nuclear establishment officials in -- you know, not in public, but you know, privately, if you had to do this all over again, would you go for the separation of plutonium and the re-use of it. And most of them would say of course not, just looking at the experience.

You know, one of the problems that you know, all governments have is that the tyranny of some costs -- you make decisions, you invest careers, you sink lots of investment. And it's very, very difficult to look at the world going forward, rather than to kind of take into account all that's happened in the past. But you know, there are many Japanese who would look forward and say, wait a minute, we've got to -- you know, we've got to step away from these sum costs and do the right thing going forward.

How much support does that idea have? I ask anyone, but you know,

especially Ambassador Abe about this.

AMBASSADOR ABE: Okay. I don't have a clear answer to it, but it's a very important question. And by the way, besides serving as director, I also teach with a number of schools, and I talk with the students and I talk about a teacher disarmament non-proliferation and nuclear energy; and because it is a very interesting subject for students these days.

They get all the views. It's interesting. Some of them realize that we are living in a real world. Therefore, even though we have seen a terrible accident and we are afraid of any accidents that may come again, there's still a number of students who say, but we still have to live in the real world where we have to earn our living, we have to make our exports and so and so. They tend to accept continuing some nuclear power generation at a certain reduced rate.

But it's interesting. In the latest governor's election in Tokyo, two major candidates came out with the anti-nuclear platform. Former Prime Minister Hosokawa almost ran on that single issue. The other communist socialist candidate also had an anti-nuclear platform. Both of them lost, but even then, they won something short of one quarter of the votes each. So, that shows in Tokyo, at least, a substantial number of voters favor going out of the nuclear power generation. That's quite significant.

When I teach students, I also take an example of science, and I tell them when the people started using steam engines, they had many explosions of the still developing technology. When they came up with the internal combustion engines for cars, they had many accidents. They overcame. They're still using them.

Nuclear, unfortunately, we had many accidents. Should we give them up or should we continue? Human history has two sides of stories. One example is supersonic transport. The French and British had the Concord. Not very successful, and

they eventually gave up.

The U.S. had Boeing super jet -- transports -- supersonic transport idea; that had engaged in the development. But in halfway, they gave up. So, it is possible in human history that if you decide consciously that you do not use that technology, you can do so sometimes. So, even today, I think we have a choice. And ultimately, it is for the nation to make a decision.

You just cannot make a separate decision. Tokyo people say they want to give up. The other next prefecture says, yes, you can do it. Or in your neighborhood, you cannot do it, and it has to be a collective decision.

MR. EINHORN: Anybody else? Yeah?

SPEAKER: But it seems to me that the decision about recycling can be separated from the decision about nuclear energy, if you can find a way to manage the spent nuclear fuel generated by nuclear power.

And in fact, I would argue that nuclear power's future will be best ensured if we can make it as cheap, as safe, as secure, as proliferation resistant and as simple and as easy for the public to understand as possible, and that reprocessing and recycling points in the wrong direction on pretty much every one of those points. It's more expensive. It's less safe. It's less secure. So, I think that Japan could decide to move forward with its nuclear energy, but not move any further forward, or at least not much further forward on recycling of spent nuclear fuel.

There's one thing I did want to say about your remarks, Ambassador Abe. I would argue, Ambassador Imawi lost because he was wrong. So, the U.S. National Academy of Sciences, in a study that I took part in, looked at what the United States should do with all of the plutonium from dismantled weapons. And one of the questions was this -- reactor grade versus weapon grade and so on.

And we went -- the members of the committee who had clearances went and talked to all of the weapons lab. We worked our sort of statement that was approved by all of the weapons labs. Ultimately, the Department of Energy put out a more elaborate statement that again, was reviewed by all of the weapons labs. And the basic notion was, you can make a bomb with reactor grid plutonium, even fairly high burn up reactor grid plutonium.

Any state or group that could make a crude bomb from weapon grade plutonium could also make a crude bomb from reactor grid plutonium that would have an assured yield in the range of kiloton, and probably yield higher than that. And an advanced state could make a bomb from reactor grid plutonium that would have similar yield liability weight, et cetera, to bombs made from weapon grade plutonium.

And we've gone around and talked to weapons designers from all of the P5, and haven't found any serious disagreement with the material that we declassified. One of the only Russian weapons designers I know who had actually been assigned to look at the question, how hard is it for terrorists to make nuclear weapons, and what kind of designs might they use, said to me, well, I don't disagree with anything you said, but I would have added one particular point, which I won't repeat here, because I wouldn't necessarily repeat it in public (Laughter) about how straightforward it might be for the terrorists to use the reactor grid.

MR. EINHORN: Anything else?

MR. BIRCH: Yeah, I just wanted to -- I think there is this -- that the two issues are joined; nuclear power in Japan and the fast meter reactor program are almost -- are twinned, are joined at the hip.

And I talked to many Japanese who seemed to think -- it was difficult for them to distinguish between the two; that if you're going to pursue nuclear power, it has

to, at some point, become a fast breeder plutonium program. And I think that this -- we talked Taro Kono, who you may know. He's the member of the Diet, and he has been a long time critic of plutonium reactors; not necessarily -- he was not always opposed to nuclear power, in general, but he was always concerned about the plutonium program.

And I mean, he said that he had a very hard time explaining to other members of the Diet what the distinction was; what a fast reactor was. So, it was not -- at any rate, he also -- it's just -- I think it has to do with this waste issue. Is that correct, Ambassador Abe? Do you think it has to do with the waste issues at the -- that the fast breeders can reduce the volume of waste, and this is seen as a way of avoiding the whole problem of long-term disposition. Is that correct, do you think?

AMBASSADOR ABE: No. I think -- can I?

MR. EINHORN: Sure.

AMBASSADOR ABE: The fast breeder reactor idea dates back to the beginning of the nuclear age. In those days, the amount of available uranium around the world seemed to be limited. Therefore, if you embark on a nuclear power generation, sooner or later you have to find other fissile material, which was plutonium.

And for that purpose, the faster breeder reactor was considered to be an ideal reactor, which can produce more fissile material than you consume. But history shows that later on, we found that there is more abundance of uranium around the world. So, you don't have to make such a haste in developing breeder reactors, or even have MOX fuel.

But I think, when you think about longer-term energy problems, indeed, we will be trying to use that renewable energy, solar winds and other sources, but still, the amount may be limited; the supply may not be constant. Therefore, you have to have some energy source to complement. In the future time, in 50 years, a hundred years'

time, fossil fuel may run out.

So, for the future time, as a hedge, at least, I think we need to maintain the nuclear energy option. And for that purpose, we need to maintain a technology which can also continue providing fissile material, which is in today's technology, a breeder reactor.

MR. EINHORN: But isn't it true -- I mean, plutonium has been such an integral part of Japan's program for so many decades. I mean, look at how the U.S. went. We went in a completely different direction. I remember -- I forget who sponsored this cartoon character, Pluto. It was you know, a very endearing little cartoon character, but it was designed to make the Japanese public comfortable with this.

And you know, it's interesting, when one things of solutions -- and Prime Minister Abe is -- his report continues to regard plutonium -- the use of plutonium as a fuel, as an integral part, and it's curious to me that there doesn't seem to be much support for you know, nuclear power generation, on the one hand. But without the use of plutonium recycle. But just to realize, to treat it the way the U.S. does, as waste, you have to be able to store it at an interim base to dispose of it over the long-term, but not try to use it as fuel.

But you know, I'm curious why there isn't a strong -- to me, at least, there doesn't seem to be a strong lobby for that point of view, because plutonium has become so integral to Japanese nuclear energy thinking.

AMBASSADOR ABE: Well as I said, it started with the idea of having a renewable fissile material supply in Japan, dating back to the time when uranium was considered limited. Now, we know that we have more abundance, therefore, we don't need to make that much hurry as they thought at the beginning. And I think that the Japanese are maintaining that, but the U.S. somehow abandoned that option.

But the MOX fuel basically burning is, in a way, to use plutonium, which is maybe in excess, and which the U.S. also did when they had the plutonium from -- dismantled the nuclear weapons from the U.S. and Russia.

SPEAKER: We tried.

AMBASSADOR ABE: They tried to use it in the reactors. And in a way, that is a similar thing Japan is trying to do.

MR. EINHORN: Why don't we open this up there -- people in the audience who know -- actually, let me call -- Kevin, your words were put up on the screen there. You get the opportunity to speak first.

SPEAKER: Yeah, I was -- on the physical rotation issue, that was referring to 2003, and I think they've made a lot of progress, but they still have a way to go. My question is really on the Rokkasho (Inaudible) issue. There's so much inertia in this program, invested interest in this program. To me, that's the hurdle, the hard decision.

One reason that was given as the justification for the program was national security. If Japan is blockaded, you still have energy security by reprocessing spent fuel. Other justification -- well, that was -- the real reason, which Ambassador Abe touched on was, you have no long-term storage. Neither does the United States. Nobody does, so we can't criticize Japan for that.

But your justification for the program is, you kicked the long-term storage question down the road by 20 years by recycling the fuel. But if you're not going to -- everybody knows that's not a valid justification, because at best, you're going to restart maybe 20 reactors, at best. So, you will be producing more storage.

But the problem with the Rokkasho-mura facility was it was delayed so long, because you need to create jobs for Tokyo University nuclear graduates. So, you

took an Arriva design that worked very well and tried to localize it, and you broke it. That's what -- I mean, everybody knows that's what really happened (Laughter).

So, how do you overcome these vested interests that are tied to Rokkasho, when given the reality now from my perspective, I think you do need to restart your nuclear power plants, as many as you can do safely and politically. But by keeping this tie to the Rokkasho program, you're just complicating your ability, in my view, to restart the nuclear power plants, because there's so much skepticism about this program now, and it's not economical.

The industry never wanted to do it. They were pressured by the Japanese government, because they paid five times the cost for fuel. The Japanese public -- still most people don't understand, for years, they've been paying for this through surcharges for their utility bills. And it's not a secret. It's just most people are not aware of it.

But my real question is, looking at your long-term nuclear strategy, if you're going to have a viable nuclear program, how can you break this vested interest in the costs in Rokkasho-mura, given the lack of logic in continuing the program?

MR. EINHORN: I think you're in the hot seat again.

AMBASSADOR ABE: A very important question, I admit. And I don't have any quick answer to it. (Laughter)

MR. BUNN: Well, I do think, as I was saying in my opening remarks, that you need a comprehensive solution that addresses all of the interests. You need something that deals with managing the spent fuel and gets political acceptance for managing the spent fuel. I think if it was part of making a reactor safer, that would increase your chance of getting political acceptance.

You need something on jobs and taxes for Aomori prefecture. You need

something on sort of nuclear power and the nuclear power industry. So, it seems to me, there's a lot of piece that -- and you need to some sort of serious leadership to pull together a comprehensive package like that and try to sell it. But that's a very hard job.

MR. BIRCH: Taro Kono, the Diet member -- we talked with him about this extensively. Jake Adelstein is here from Tokyo, who is one of the co-authors. And I just wanted to -- we didn't manage to get this into the story, so I'm going to go over a little bit about what he proposed. He said the government first should give the country's electric utilities the right to use the money -- use money they have collected to pay for Rokkasho; the surcharges -- to pay the $10 billion they still owe on the construction of the plant.

And under the current law, they can only use the money if the plant opens, so that would require a change in the law. Next, the government should persuade elected officials in the communities where Japan's 50 reactors are located to accept the return of their spent fuel, and keep it there indefinitely using dry cask storage. Again, this is Mr. Kono. With this technique, spent fuel has been left in cooling ponds for up to five years, Matt? Is that about right?

MR. BUNN: Well, it's been left for many more than that, but it needs to be left for at least five years before you move it into a dry cask.

MR. BIRCH: Anyway, he said despite the challenge of persuading local officials to accept the return of spent fuel that they thought was gone forever, he thinks it can be done. The power industry doesn't want to use the dry casks because they don't want to renegotiate with the local mayors, because it's a pain. Because it's hard and because it's time consuming, and it means unraveling deals that were so carefully raveled in the first place.

He said pressuring officials -- this is his view -- pressuring officials in

Aomori and Rokkasho, you know, the area where Rokkasho is located to keep the spent fuel is not an option, because it would renege on the government's promise and compound a historical injustice to people living in the region. The region was kind of a Siberia for political exiles about a hundred years ago.

And so, there is a great deal of sympathy for the Aomori and for the Rokkasho area in Japan, and it's one reason they were given this huge nuclear complex, and it's kind of a jobs program. So anyway, he said even today, Aomori is still one of the poorest areas in Japan. Kono, in describing dry cask storage, he used a Japanese religious tradition as an analogy. He said that they could treat the spent fuel the way that Shinto priests have treated Ise Grand Shrine in Central Japan since the millennium.

They rebuild the structures every 20 years to replace them completely from the ground up. They recreate them piece by piece. And he said the ritual is intended to perpetuate the buildings and preserve the skills of generations of craftsmen. So, we have to do the same thing with dry cask storage for nuclear waste, he said. And he wasn't being ironic, at all.

Every 50 years, you build a dry cask and transport the spent fuel to the new one. And if you do it 20 times, it's a thousand years. And hopefully, by then, we'll get a new technology to deal with it. (Laughter)

AMBASSADOR ABE: In the last governmental election in Tokyo, the major point of debate was the -- the sentence Hosokawa said that the nuclear power stations are something -- an apartment without toilets. In other words, there's no way you dispose of the wastes. And that was a major point of contention.

I think in order to settle and come up with any clear answer to the Rokkasho question, you have to give a clear, good answer to the question of waste. And then, you may be able to persuade those who are arguing to get out of a nuclear power

generation. So far, the major -- main major conventional thinking is underground storage. The other idea is, well, temporary dry cask storage.

The latest energy basic policy plan, recommendation that the METI panel came up with, is this idea of a retrievable storage concept. And in 30, 50 years' time, they may retrieve the waste stored underground, and to use better technology in 50 years' time from now to deal with that question. And that may be sort of evolving thinking among those who are engaged in the nuclear business in Japan. And that may win greater support among those who are worried about the no toilets question.

MR. EINHORN: After all, the ill-fated Yucca Mountain Repository was going to be retrievable for 300 years under the original plan. I should mention, by the way, that you know, it isn't true that everywhere we're making no progress on nuclear waste. We're making no progress in your country or my country, but both Finland and Sweden have recently succeeded in citing nuclear waste repositories with the complete support of the communities where the repositories are to be built. So, it appears not to be a hopeless task.

MR. EINHORN: Interesting. Miles?

MR. POPPER: Miles Popper from the Monterey Institute. One comment, and then two questions.

I think Ambassador Abe made a comment about dry cask being voluminous. Maybe that was only in comparison to high level waste, but it's not particularly voluminous. And I think we calculated -- I haven't done it for Japan, but we calculated for South Korea, you could fit all the waste -- the spent fuel in South Korea in Lafayette Park across from the White House. So we're not talking about a lot of space.

The two questions, one thing -- you know, we're talking about sort of a long-term question about Rokkasho, but it seems to me there's also just a short-term

question, which is you've got -- the MOX plant is still under construction there, and talking about moving ahead with the reprocessing plant before the MOX plant is operational. It seems the first step would be to just say, we're not going to do any reprocessing until there's a MOX plant to deal with the product of the reprocessing plant.

The other question is for Bob. The U.S.-Japan bilateral cooperation agreement, the initial one -- I mean, the recent one expires in 2018. There's essentially an automatic rollover. But is there any prospect that some of these issues may come up, and it's not completely automatic, and is there a look at the U.S. government in dealing with that question?

SPEAKER: You?

MR. EINHORN: On the U.S.-Japan, as you know, it's an automatic rollover, unless either country decides you know, to pull the plug. And I don't see any prospect of that whatsoever. Of course, you know, either side is -- you know, can raise concerns, and so forth. I cannot imagine the U.S. making rollover conditional about some demand with respect to Japan's nuclear energy program, the startup of Rokkasho or anything like that.

I can't imagine it. I can imagine having, you know, some quiet discussions with the Japanese about preferences, but I can't imagine that we would you know, hold continuation of the agreement hostage, you know, to any of these particular concerns. But there was a question directed to you?

AMBASSADOR ABE: Mm-hmm. It was a question about MOX manufacturing plant. Is that right?

SPEAKER: Right, and should we -- I sort of argued that Japan should at least accept a moratorium on operating plant until the MOX plant is open, so until 20 -- people are talking now about 2017 for the MOX plant.

AMBASSADOR ABE: I don't claim to know all the details about Rokkasho, but I haven't heard about any problem about the MOX manufacturing plant. They have been delayed, and their major problem was this beautification which makes hideable waste put into sort of a glass container. That part, they had the problem, and it seems that they are overcoming it, and that they are (Inaudible).

SPEAKER: My understanding is the MOX plant -- officially, it's supposed to open in 2016.

AMBASSADOR ABE: Mm-hmm.

SPEAKER: But talk is it won't open until 2017, actually.

AMBASSADOR ABE: Okay.

MR. EINHORN: Yes? You.

MR. FORRESTER: Hi, Alex Forrester with the East West Center here in Washington. I see a lot of parallels between what's going on here in Japan with the ongoing 123 renegotiations with South Korea in terms of their being some debate about the viability of the technology -- you know, security of the technology as far as not producing fissile materials. But in South Korea, it's about pyroprocessing.

And I'm just wondering if you think what's happening in Japan as far as Rokkasho goes will have any implication for the renegotiation process between the State Department of Energy and the South Korean negotiators.

SPEAKER: Maybe I should comment on that. You know, in the course of their many years -- many years -- several years of discussions with the ROK on a renewal of their 123 agreement, often in my view, the U.S. side was able to provide convincing answers on some of the main South Korean concerns about the future of their civil nuclear energy program; whether it was reliable supply of enriched uranium for the light water reactors, whether it was the competitiveness of the nuclear industry

worldwide, whether it was the storage of spent fuel.

For each of these problems, and these have been problems identified by President Park, I think there were reasonable solutions that didn't involve South Korea getting involved in fuel cycle activities enrichment or pyroprocessing reprocessing. But there is a component of this discussion which is non-technical.

It's quite political. It's even quite emotional. And that is that for South Koreans, especially South Koreans in the nuclear establishment, Japan is the eternal reference point. And I can't remember the number of times it's been mentioned to me that the United States provided advanced consent. We saw up here on -- Jeff showed the secret memo in 1982, I guess, in which the U.S. provided advanced consent for Japan to reprocess U.S. origin spent fuel.

And invariably, the South Koreans have this concern. You've provided it to Japan, why not to us? And there's several good answers to that question. I mean, back in '82, concern about fuel cycle capabilities and the implications for proliferation were not as acute. We've had experience since then which has made us much more sensitive to that.

Also, by that time, Japan had an ongoing reprocessing program, whereas in the ROK, pyroprocessing is still in a laboratory scale technology. So, I think there are answers why it makes sense for South Korea to study this phenomenon more. We're engaged a joint fuel cycle study with the South Koreans that looks at pyroprocessing, and we've agreed that we would review this question of consent down the road as we learn more about this technology jointly.

But at this stage, we simply think it's premature and unnecessary for South Korea to have a very vibrant nuclear energy program without these technologies that they would like advanced consent for. But you asked, what would be the impact of --

you know, one or the other on Rokkasho. I think Rokkasho starting up -- whatever you think of the wisdom of thought decision, I think would make it more difficult to reach agreement between the U.S. and the ROK, because I don't see the U.S. view changing at all.

But I could see the South Koreans digging in more deeply if they think the Japanese are doubling down on reprocessing technology. So, on the other hand, if Japan were to say, okay, we're going to put a moratorium on any Rokkasho startup until we have some convincing disposition path for the material that might be separated there, I think that might have a positive effect.

Or, if Japan took a more basic decision that plutonium recycle really doesn't make sense, we could have a vibrant nuclear energy program. We can get lots of these power reactors back online if we don't renew our commitment to plutonium recycle. I think that would have a profound impact on perceptions in South Korea.

I mean, you know, we tell the South Koreans over and over again, look at all the countries that had active reprocessing programs that looked at -- you know, looked at the economics, looked at the technology and decided we're not going to do this, starting with the United States. And there are many other advanced countries that did the same thing. But basically, those examples don't count. The Japan example counts for South Korea. That's the reality of it. Yeah? Yeah?

MR. ADELSTEIN: Hi, I'm Jake Adelstein for the Center for Public Integrity. A question for Ambassador Abe.

We spoke with Mr. Sugimoto at the nuclear regulations thing, and one concern that has been addressed many times and then it's been reported and confirmed again and again is that Japan's nuclear industry has very tight relations with Japan's organized crime groups, which exist legally and aren't banned; meaning that Yakuzas

supply labor to the plants. They work with the plants.

Rokkasho itself is managed by a security firm called New Tech. Now, in a series of articles written about New Tech, the president of that company, Shido Kawashido has been written up for his past associations with organized crime; mean Yakuza bosses. And in a law suit that he put against a journalist for writing about the fact that he had hired Yakuza on behalf of a politician he had worked for, she had called it off; dropped the lawsuit.

So, you have this issue of not only organized crime people entering the plants because there's no background checks, but you also have someone affiliated with it in the past running the security firm that manages Rokkasho. Is there something in Japan's indigenous organized crime groups that makes Japan feel that they aren't a threat to nuclear security?

AMBASSADOR ABE: About first of all, background checks; I am in favor strengthening background checks. But as it has been mentioned, there is a social, cultural difficulty in Japan to carry it, because of the issue of minority groups involved in this question.

As for the organized crime involvement, Japan has a law against organized crime, and even belonging to organized crime is a crime in Japan. And for example, public corporations cannot award contracts to those organized crime organizations. So, I think if it is proven that they are the ones, I think they will not be hired.

MR. EINHORN: Yes, sir?

MR. WINTERS: Steve Winters, local researcher. I'd like to get a comment from Ambassador Abe.

This is somewhat tangential to the current discussion, but it came up

repeatedly during the presentation, which was the statement that the Japanese officials felt that the issue of security was not as severe in Japan as, for example, in the U.S. But I was at Kyoto University 20 years ago when Shoko Asaharo was there recruiting personally students there that I saw myself. They had a very strong support group at the university.

Of course, he also recruited people from Tokyo University. He one way or the other, reached the top young scientific minds, or some of the top young scientific minds in Japan, set up an industrial plant for production of sarin gas, pulled off a major terrorist attack in the heart of Tokyo's governmental district which was designed to kill thousands of people, and almost did.

And so, I just wonder how there can be this feeling in Japan, no, we don't have terrorists here. In any case, they would be some people from Serbia who didn't know what they were doing, anyway. Because I can guarantee you, from knowing those students when I was there, if Asahara had turned himself to nuclear (Laughter) devices instead of sarin gas, they would have had no problem.

MR. EINHORN: We did a fair amount of work on this question. We found that a confounding discrepancy, the sense that Japan was isolated and unthreatened by the kinds of terrorist threats that -- you know, if you measure that against the history -- and Doug will talk about it for a minute, because he (Inaudible).

MR. BIRCH: Well, I mean, Asahara was interested in nuclear weapons, and in fact, there are well documented reports that one of his top lieutenants went to Moscow and tried to buy one, and there is -- reportedly for $15 million, back at the time when the Soviet Union was dissolving and the new Russian state was being created. It was fairly chaotic; early '90s.

Also, that he bought a -- that Asahara bought, and his followers bought a

500,000 acre ranch in Australia where they tried to mine uranium and refine it on their own, which was a somewhat quixotic effort. And I mean, it didn't go very far, at least as far as anyone knows.

But I mean, obviously, he was dead set on getting that technology. In fact, it was only after he failed to do that, that he turned to the sarin program. I mean, his chemical and his biological weapons programs. And he was very successful, obviously, with the chemical weapons. And I mean, this was something that I think everybody we talk to in Japan -- I mean, everybody we talked to on the U.S. side who had been engaged in trying to convince Japan that it was somehow -- that it was vulnerable to international terror, to nuclear terror, that this -- there was a sense, and I think it's a sense in a lot of countries that haven't faced a terror attack like 9/11, that you know, oh, it could never happen here. We're not the United States.

You know, we're just not those other people who have been victims of this in the past, just like I think the U.S. felt it was invulnerable to the kind of terror attacks you saw in a place like Russia after the fall of the Soviet Union.

MR. EINHORN: Or even in Tokyo with the Red Army attacks which preceded 9/11, of course.

MR. BIRCH: Yeah. Well, the Red Army, and also, there's Middle Corps faction. You may be familiar with them, as well. And Middle Corps faction was another terror -- indigenous Japanese terrorist group. And they set fire to the liberal democratic party headquarters in Tokyo in 1984 with flame throwers, fired mortars at Haneda Airport in 1985, and launched homemade missiles against the Imperial Palace during the '87 summer meeting of the Group of Seven.

So, I mean it's not to say that Japan has a worse problem with terrorism. Obviously not. But they're far from immune to it. I mean, this is what I sort of --

MR. BUNN: I think it's important to draw back a bit and talk about the world problem, as opposed to just the Japan problem. One of the things we have on that web site I had mentioned is a briefing that was given to the Sherpas preparing for their nuclear security summit at their last meeting before the summit on the state of the nuclear and radiological terrorism threat.

And it makes the point that both Al-Qaeda and Aum Shinrikyo pursued nuclear weapons fairly aggressively. Al-Qaeda's program reported directly to Zawahiri. It got to the point of actually carrying out some crude but sensible explosive tests in the Afghan desert for their nuclear weapons program. And although, Al-Qaeda, of course, is very much diminished, almost all of its nuclear people are still at large, and we have no idea where they are or what they're doing.

And I would argue that with at least, and there's some significant but not as conclusive evidence about Chechnyans, as well -- so at least two, probably three terrorist groups having significantly pursued nuclear weapons over the past quarter century, we can't expect they will be the last, and that this is an issue that's going to be with us for as long as terrorists interested in mass destruction and the materials that could be used to make nuclear weapons both exist in the world.

SPEAKER: Let me just add one more point that cropped up in the course of our investigation, which is that it's not just the prospect of somebody assaulting a nuclear facility, such as Rokkasho, that's worth taking seriously. It is also the prospect of an insider threat.

SPEAKER: Right.

SPEAKER: And the IEAE standard for large facilities like Rokkasho is quite high. It is that they will be able to monitor and track the flow of about 99 percent of the material that flows through a facility of this kind. This is a standard which the IEAE

has embraced, which we've confirmed was the standard that was built into the IEAE's monitoring plant at Rokkasho.

The problem is that the capacity of the plant is so high, that it still makes it possible for, you know, enough plutonium to fuel about 26 weapons a year to be -- to go missing, in effect -- 1 percent of their capacity still allows for that kind of discrepancy in the material accounting. Now, the IEAE, when we asked them for comment said, well, it's not the only thing we're going to be doing to monitor the plant.

SPEAKER: Exactly.

SPEAKER: They'll be having random you know, inspections and visits. But the IEAE's you know, inspection system is largely meant to prevent willful diversion by the state in which the plant is operating. It's not meant to prevent insiders, you know, in the employ of a terrorist group or somebody outside and someone from another country from secreting the material outside of the plant, you know, unnoticed. And the capacity of Rokkasho is high enough to allow that to happen with the IEAE knowing about it.

SPEAKER: Well, let me offer two modest modifications. One, it really is important that it's not just the accounting. There's lots of stuff that the IEAE is doing at a plant like Rokkasho. They have, for example, an ability to monitor whether there are any changes in the piping that are sending some plutonium solution off somewhere where it shouldn't be going, and things like that.

And I would argue that there's also things that aren't part of IEAE safeguards, but that help you on making sure that an individual isn't taking something out, like the portal monitors at the door that set off an alarm if you're carrying out plutonium or what have you.

That being said, I would also like to see stronger insider protections, not

only in Japan, but practically everywhere, including in the United States. I mean, if you go to Y-12, where the incident with the intrusion with the 82 year old nun took place, they have an armored personnel carrier that fires 3,000 armored piercing rounds a minute. But their insider protections are not anywhere near as impressive.

AMBASSADOR ABE: One point.

MR. EINHORN: Please.

AMBASSADOR ABE: This question of diversion or theft. Indeed, when you come to process tons of plutonium, even the sort of residues collection that may stay in the pipelines may become kilograms. And if you think eight kilograms can make a bomb, it's a problem.

So, the Japanese scientists at the JAEA is now working on a new technology to measure the amount of plutonium or uranium that goes through pipelines other places without stopping the operation or without touching them, through sort of a neutron or other radiation detection device and very precise measurements. They're working on it.

One thing -- additional advantage of having this Japan's cooperation agreement is that by virtue of that agreement, bilateral agreement, the safeguards verifications on those facilities, including Rokkasho, will stay perpetually as long as the agreement is there. Even if Japan declares we are out of the IEAE, as far as the U.S.-Japan treaty -- agreement remains. It is there. That's an additional guarantee.

MR. EINHORN: Last question. Dean?

MR. RUST: Thanks. Dean Rust, State Department.

I'm not sure this assertion is fair, but why is the U.S. government so passive about this? (Laughter) I mean, if Obama wants to -- if he believes nuclear terrorism is such a big threat, then shouldn't we be moving heaven and earth to try to

persuade them to at least delay the opening of Rokkasho?

I mean, the reason for the advanced consent in 1982 is because they met certain statutory requirements. And that's now 32 years later. I mean, can't we at least revisit it? We're not going to withdraw the consent, but it seems we can bring a little bit more pressure than we're doing.

SPEAKER: I can no longer speak for the U.S. State Department (Laughter). There are others here who can, and may want to stand up and say something. But I think the reality is that here -- you know, this is his strong ally of the United States who's gone through some real hard times. And I think there's a disinclination, especially during these very difficult times in the energy security area for Japan to make life too difficult.

And if there are preferences about how Japan conducts its nuclear fuel cycle policies, I'm sure those preferences would be expressed in private discussions, rather than publicly.

SPEAKER: And you know, frankly, I think many would consider me a nuclear security fundamentalist, but I also would argue that the most effective approach that the U.S. government can take is to work in a friendly with Japan. I think we can, for example, do joint R&D on safety of dry cask storage. We can have you know, joint public forums to talk about dry cask storage.

I think we can do joint R&D not only with Japan, but with a number of other countries that have issues with plutonium they don't know what to do with, including the United States now, with the cancellation or putting into cold standby of the MOX program, as to what to do.

Are there some other options for what to do with plutonium that's already been separated? So, I think there's a lot of ways we can work together that can help

make this situation better, rather than just leaning with our heavy thumb.

MR. EINHORN: Any last word?

AMBASSADOR ABE: Last word. About this point?

MR. EINHORN: Or any point.

AMBASSADOR ABE: About this point.

Well, say if you have one ton of gold bullion and you're concerned about theft, what do you do? Do you keep one kilogram in each household so that you can reduce the risk, or do you keep one ton at Fort Knox, heavily guarded? Japan has already, say, 30 tons of plutonium separated in France and Britain. Nobody talks about the danger that terrorists may come and grab them. I haven't heard about it.

MR. EINHORN: We'll get there (Laughter).

AMBASSADOR ABE: Or will that 30 tons increase to 40 tons with the risk increase? Scientifically, no. So, ultimately, if it is something necessary, you may have to produce it. And then, you have to think about what is the best way to protect it, rather than to just think about eliminating them.

MR. EINHORN: Well, we've heard that --

SPEAKER: If it's necessary.

MR. EINHORN: We've heard that the Center for Public Integrity --

AMBASSADOR ABE: If it's necessary.

MR. EINHORN: -- is going to do an expose now on the lack of nuclear security in France, so we meet again here next year (Laughter) to get that report.

Anyway, I want to thank you all for coming. I'd like to thank the Center for Public Integrity, the Stanley Foundation, our speakers, some who came from as far as Cambridge, Massachusetts (Laughter), but especially Ambassador Abe who came all the way from Tokyo for this event.

So, thank you very, very much (Laughter). There are copies of our investigation on the table, if you'd like to take a copy.

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