CARNEGIE
ENDOWMENT FOR
INTERNATIONAL PEACE

Transcript

KEYNOTE: SECRETARY OF ENERGY ERNEST MONIZ

Ernest Moniz, U.S. Secretary of Energy

Carnegie International Nuclear Policy Conference 2015

March 23, 2015

(Transcript not checked against delivery)

ERNEST MONIZ

Well thanks Bill; I had not expected my full heritage to feature in the introduction. But as most of you could just imagine, it was certainly a pleasure working with Bill over the last years and our paths will cross more here I am sure at Carnegie. But to be honest they cross more often than I had thought, still back in some of the old haunts and Bill did a great job as you know. I know this conference is looking at a very broad variety of nuclear tropics from security of fuel cycle to vulnerable materials around the world, to nuclear deterrents. The problem is energy has a similarly broad portfolio of all things nuclear.

Even as we lead in areas for the government in areas like you know clean energy technology, basic physical science, research about 2/3rd's of our budget is devoted to advancing America's nuclear security and cleaning up the legacy of past nuclear arms development. President Obama's January 2015 nuclear security strategy stated that no threat poses as great a danger to our security and wellbeing as the potential use of nuclear weapons and materials by irresponsible states or terrorists. That threat as people here no very well is not static. Last quarter century has witnessed dramatic shifts in the global nuclear security environment.

Cold War has ended but thousands of nuclear in large stockpiles and weapons usable materials remain. You have political instability and sources of potential conflict persist especially in countries and regions with an active and indeed often growing terrorist presence. New technology manufacturing processes continue to merge, sometimes without a full understanding of the potential security risks that they may involve to use items, 3D printing you name it. The concerns about climate change and rising demand for clean energy on the one hand risk increasing dislocations and on the other have led many areas at least to growing interest in nuclear power and fuel cycle development and that including research reactors.

Consequently an increasing number of countries with little to no experience in nuclear technology will be faced with the tasks of safely and securely managing nuclear facilities and protecting nuclear materials including spent nuclear fuels. Finally, the emergence of nuclear capable or nuclear threshold states, such as North Korea and Iran is challenging the fundamental principles of the global nuclear non-proliferation regime. Our national nuclear security administration at NNSA headed by our Under Secretary and Administrator for nuclear security, Frank Klotz, who I believe is here somewhere. Is tasked with ensuring that America's nuclear weapons remain safe, secure and effective without testing, while working to combat proliferation, secure vulnerable materials, prevent nuclear terrorism and respond to potential nuclear disasters. Further our Naval Nuclear Propulsion Program ensures reliable operation of the navy's nuclear power fleet, including 73 submarines and 10 aircraft carriers. Our office of nuclear energy, organisational under the Under Secretary for Science and Energy is working to support the next generation of advanced nuclear reactors including small marginal reactors, while ensuring that our current fleet has the technology needed to remain safe and efficient.

And advancing viable consent based nuclear waste solutions. The work on nuclear fuel cycles clearly intersect the non-proliferation agenda and collaboration between nuclear energy and NN is in fact both essential and quite active. And the weapons cleanup program that I referred to earlier on in the budget is under the Under Secretary for managing performance. All I want to emphasis there is this broad nuclear agenda at DOE engages all three Under Secretaries, NNSA, Science and Energy, Management and Performance. And that is why recently we established and I personally chaired a new nuclear policy council that provides a venue for senior folks at DOE to exchange ideas on cross cutting nuclear issues and to charge appropriate policy development.

Let me turn to nuclear fuel cycle. As we work to fulfil the global demand for affordable, reliable and carbon free energy, nuclear energy clearly has an important role here to play in America we think and around the world. Today it accounts for more than 80% of carbon free electricity in the United States. And last year the United States nuclear fleet produced 90% of its maximum generating capacity. The highest level ever recorded. However, we also have to consider carefully the nuclear fuel cycle both from a national security perspective and also from the energy security perspective.

Let me start with national security. I know that the P5 plus 1 negotiations with the [00:19:34] and many here, and I can't say much specific about this now, but I did spend all of last week in Switzerland as part of the US delegation, headed by Secretary Kerri, to the Ukrainian nuclear negotiations. These negotiations led by the state and the White House draw upon other agencies in their areas of expertise and not surprisingly that includes the Department of Energy.

DOE is able to draw upon a vast scientific and technical expertise base from across our national laboratories and other sites. So I just wanted to emphasise that frankly while our role has become more visible over the last month, I just want to emphasise that the department has been engaged all throughout these negotiations providing extensive technical advice and input to underpin our negotiating position. Almost 10 labs in sites in fact have been called upon in supporting the various positions that the United States is called upon to analyses in these negotiations. For example, DOE has done analysis of the rands nuclear fuel cycle in order to provide technical recommendations on topics like enrichment, RMD and breakout timelines. Similarly, the Iraq reactor and the plutonium path weight of the weapon has been analysed. The analysis is rigorous and central to the discussions because we need to be very clear and international community needs to be very clear about what we are getting in technical dimensions of a possible agreement.

On the Ukraine side I want to emphasise that Dr. Alie Selie, head of the atomic energy association of Iran also joined the talks in effect putting the heads of both countries nuclear organisations at the table. That is all I can say about the negotiations at this point but our engagement in these talks is just again one example of the department's deep involvement in security of the nuclear fuel cycle. And as you know the discussions will resume within days. Of course non-proliferation is only one piece of the nuclear fuel cycle. These efforts go hand-in-hand with the Department of Energy's work to increase the energy security of nuclear energy as well. The US has enforced 22 civil nuclear cooperation agreements with 49 partners forced during the development of over 70 gigawatts of clean nuclear power worldwide.

These agreements that only facilitate access to the safest and most advanced civil nuclear technology commercial available but ensure the transfers of US technology are consistent with US non-proliferation commitments and the highest safety and security standards. And looking back to the non-proliferation discussion, we worked through these agreements to encourage our partners to rely on the global market to fuel these reactors rather than pursuing indigenous enrichment and processing capabilities.

DOE backstopped these agreements with physical fuel assurances through the America Assured Fuel Supply. A bank containing 17 metric tons of LEU fuel which US partners may draw upon in an event of a supply interruption. These measures contribute to the security of the fuel cycle and the energy security of more partners. Ukraine offers an important example of how diversity increases security. There has been widespread coverage regarding Ukraine reliance on Russian natural gas and of counsel, European reliance on gas as well. What many don't realise or think about is that Ukraine relies upon nuclear power for half of its electricity and of course the nuclear fuel for those reactors is 100% sourced in Russia, supplying Russian origin reactor technologies.

When Ukraine gained independence from the Soviet Union, the only manufacture or fuel suitable for their reactors was Russia. And again, in a situation that is replicated in a number of other countries. So after independence in 1991, US experts from the Department of Energy began working with Ukraine to address its lack of flue market positions for its soviet design reactors. Which represent approximately half again of the country's total electricity generation? In 1999 the Ukrainian government formally requested US assistance to develop additional nuclear fuel supply options, which led to a formal agreement in 2000 to qualify a US vender as an alternative nuclear fuel supplier. The government chose Westinghouse through a competitive process to design and manufacture the fuel assemblies.

The research went forward with little fanfare as Westinghouse, US national lab personal and their Ukraine counter parts worked together to design a western fuel assembly that could work in a Russian designed reactor with Russian and Western fuel. In 2005 we began testing assemblies. In one reactor at the South Ukraine Nuclear Power Plant, by 2009 Westinghouse fuel began commercial qualification side-by-side with Russian fuel and by 2014 all of the Westinghouse commercial assemblies had operated successful without issues.

The research and development cost was about $70,000,000.00 over the lifetime of the project. But the return on that investment is many times over that initial investment. Today Ukraine has an alternative vendor for its nuclear fuel. Other countries with Russian design reactors have a viable and reliable choice of vendors. And Westinghouse has the opportunity to finalize contracts abroad and this could mean an increase in US manufacturing jobs.

Russia's influence over Ukraine's access to nuclear fuel is only part of the energy security application. Nuclear waste was in many ways equally important. If Russia stopped removing the used fuel after a period of time Ukraine's reactors would not be able to operate due to a build up of used nuclear fuel. Another outcome of the agreement with Ukraine is a contract with another US company, Holtec International, to build a used fuel storage facility inside Ukraine. The construction cost for the Holtec facility is estimated at about $300,000,000.00 meaning the facility will pay for itself in less than two years. An in-country storage facility again gives Ukraine an option, the option to pay Russia to take back used fuel or store that used fuel locally diversifying its options.

This reminds me of course it remains us of the importance of making progress on the disposition of nuclear spent fuel and high-level waste. Russia's willingness for spent fuel return of Russian origin fuel can be an important non-proliferation advantage, basically an approach to what I sometimes call fuel leasing, while additionally providing them additionally competitive advantage. So we need to diversify not just a supply but in this case we need diversification of nuclear waste disposal as well. And that of course remains a challenge in many parts of the world including the United States. The bottom-line is that the Ukraine example of what two countries can do to realise substantial security of supply and energy security market enhancements is an important one.

When talking about Russia it is important to remember our larger strategic relationship. At the Department of Energy this relationship is rooted and science historical has been a vehicle of collaboration even when political relationships have been difficult. And there have been significant difficulties, however, we hope that our shared trust and expertise in science will allow us to continue at least some of our nuclear security work with Russia despite the current political climate and hopefully to resume more activity should circumstances allow.

As a major nuclear power, Russia remains an essential element of the global effort to address the threat posed by nuclear terrorism. Despite current differences we are ready to work as partners in areas of mutual interest. For example, we have worked with Russia to eliminate over 2000 kg of HEU from over a dozen countries around the world. Earlier this year NNSA, the

Russian Federation, Kazakhstan and the IAEA cooperated to return 36 kilograms of Russian origin HEU spent fuel from Kazakhstan to Russia. In last fall, we worked together to remove HEU from Poland. All of this happening obviously at a time of great tension. As we look forward in the 21st century we must continue to drive international cooperation around nuclear security irrespective of now complicating factors. Ultimately, it is in all of our interests to ensure that we reduce the threat of nuclear terrorism and proliferation.

The United States will continue to work with Russia in the areas that we can and I hope that our Russian counterparts will commit to a meaningful dialogue going forward. Let me return to the Department of Energy's non-proliferation efforts more broadly. Today I am very pleased to announce the release of a new report titled *Prevent, Counter and Respond – A Strategic Plan to Reduce Global Nuclear Threats*. It exists and I believe that there will be copies out back and on our website within minutes. For the first time, in a single document the department is articulating our programs to reduce the threat of nuclear proliferation and nuclear terrorism including where we see the program developing heading over the next several years. And I want to congratulate Frank Klotz and Madelyn Creedon and especially Anne Harrington for bringing this together. I think it is an important step in our ability to again to articulate what are the dangers, what are the risks, what are the needs, what are the priorities as we go forward.

I note this report is in response to the Secretary of Energy advisory board's task force on nuclear non-proliferation. As was the formation of the DOE nuclear policy council that I mentioned earlier. I will that C Ab is chaired by John Deutch, the nuclear security sub-group is headed by Brent Scowcroft and the non-proliferation taskforce is chaired by Al Consol, so it is a pretty good line-up of people who know something about the nuclear security issues. The report describes that NNSA should teach an approach to build and sustain the capabilities required to prevent, counter and respond to nuclear proliferation and nuclear radiological terrorism. This defence by other means strategy is built around three pillars that are laid out and elaborated considerably in the report.

Again, preventing non-state actors in additional countries from developing nuclear weapons and preventing non-state actors from acquiring radiological materials. Second, countering the efforts of both proliferate states and non-state actors to acquire, develop or deliver the materials needed for a nuclear device and third responding to nuclear or radiological terrorist acts or accidents. The report again as I said is now available outside the auditorium and for download from our website. So I won't go into much detail here. I hope it will inspire some conversation over the rest of this important meeting. But I do want layout one important piece of both a report in our strategy of funding and managing our non-proliferation, counter terrorism and emergency response functions. Our FY 16 budget request which went to the congress in February proposed the transfer of the nuclear counter terrorism and incident response and that the counter terrorism and counter proliferation program from the weapons activities of NNSA to the defence nuclear non-proliferation appropriation. This realignment we feel will concentrate funding for reducing global nuclear dangers in one place. It will also consolidate funding for critical R&D to support counter terrorism emergency response and non-proliferation initiatives.

The restructuring cut redundancies across programs. Strengthens compliment missions and we think provides greater clarity on the totality of the program and the funding requirement. So we think this change makes sense. Together these programs execute one of NNSA's enduring missions to limit or counter the spread of weapons and mass destruction, advance technologies that detect the proliferation of weapons, eliminate or secure inventories of surplus materials, provide a trained response to incidents worldwide, and address hostile nations or terrorists groups that may acquire nuclear devices.

In moving to close my remarks, I'll emphasize as you all know the President has made eliminating and securing nuclear, reducing nuclear stockpiles and increasing global cooperation a pillar of this foreign policy.

Last summer in Berlin the President echoed the vision he first put forward in his 2009 Prague speech calling on the global community to secure vulnerable materials, decrease the number of nuclear weapons and build a sustainable and secure nuclear energy industry. A critical driver of our nuclear security agenda has been present in Obama's vision and particularly the nuclear security summit process that he launched in 2010. As the president has said himself, what has been most valuable about these summits is that they are resulting in concrete actions that make the world a safer place. The first summit was held in Washington with 47 delegates including 38 Heads of State or government. The largest number convened by a US President since the 1945 UN Conference on International Organisation. In 2012 the summit was held in Seoul and the third summit was held in The Hague in 2014. And President Obama has announced that he will hold a fourth summit in the US in 2016. One of the largest commitments made at a nuclear security summit was the pledge by the United States in Japan to remove and dispose of all HEU and separate Plutonium from the fast critical assembly in Japan.

The joint project involves the elimination of hundreds of kilograms of sensitive nuclear material to help prevent unauthorised actors, criminals or terrorists from acquiring them. Earlier this month I hosted Dr. Toyoshi Fuketa, Commissioner of the Japanese Nuclear Regulation Authority at DOE headquarters to talk about how we can continue to move this towards completion. Our very positive discussion was the result of over a dozen meetings between US and Japanese teams since the Hague summit last year, during which our experts have tackled and overcome a host of challengers. Indeed we are still hoping that we will be able to launch the return of this material in 2016.

I use this example to demonstrate our commitment to making the summits action-based meeting with clear deliverables coming out. I also note one other part of the Hague summit that was interesting. A new approach to highlighting the nuclear challenge for leaders, namely a table top exercise involving radiological sources. We need to keep thinking creatively about how we elevate the priority of these nuclear security challenges and that I thought was one eye opening exercise for leaders from many countries. So again, in closing today I'll note that we covered a fair number of the topics on the nuclear security agenda but today at least not the maintenance of a safe and secure and effective nuclear stockpile in the absence of testing. I know that administrator Klotz will participate in the panel this afternoon and I am sure we will engage in those discussions in how the Department of Energy's technical capabilities allow for a stockpile that is that is safe, reliable and effective without testing.

I think later on this year we will also be, I think reflecting more on what I think is a remarkable achievement for our national security, namely the new paradigm that was established nearly 20 years called Science Based Stockpile Stewardship. It is absolutely foundational to a no-test regime. The United States remains committed to ratifying and entering into force the CTBT which will lay the ground work for a world with diminished allowance on nuclear weapons, reduce nuclear competition and eventual nuclear disarmament. I encourage you all to stay for that discussion that Frank Klotz will be engaged in as well as other exchanges at this conference.

So let me again say thank you to Carnegie for hosting this important conference and thank you all for your dedication to these critical issues. Thank you.

TOBY DALTON

So Secretary Moniz has graciously agreed to stick around and take a few questions. At least as long as his voice holds out I suppose. So I would ask that you please line up. There will be a few

people in each of the isle that have microphones, so I would ask that you please step to the microphones and please state your name, your affiliation and ask briefly your question or comments.

JENNIE

Thank you Secretary Moniz. Vietnamese Voice of America. Thank you for the very comprehensive plan you expressed to us. I would like to ask the importance of the outcome resolved regarding our relationship between Russia, China, the US and especially what is going on now in South East Asia including the Asia rising power, India, Japan and China regarding the nuclear power both in the changing of climates – climate change and the use of civil nuclear powers and also the potential use of nuclear in our times. Including the relationship between China and Iran. Thank you.

TOBY DALTON

A lot of territory to cover there.

ERNEST MONIZ

Well, I will try to give a shorter answer than the question. Well okay, first of all the issue of nuclear power in climate change clearly China in particular is stepping out with an enormous nuclear build although it still is dwarfed in comparison to their fossil fuel use today. But I would just note there if we go back to the commitment made by President Shea when he and President Obama announced climate objectives back in October. Much attention is paid and rightfully to the fact that China declared a peaking of CO 2 admissions. But I would call attention to a second part of that announcement which was a commitment to 20% carbon free energy by 2030. If you work out the arithmetic that is a very substantial and challenging commitment and nuclear power is certainly going to be a part of that, at least according to their plans.

We are moving towards completing hopefully the renewed 123 agreement with China and we envision ongoing collaboration.

Let me just – you asked many questions. Let me just talk a little about India. With India we are having many discussions about – particularly trying to get the administrative arrangement completed and address liability issues. We see movement there and hopefully the agreement between United States and India on nuclear collaboration is one that will flower in the next couple of years.

TOBY DALTON

Let's take one over there.

STEVEN DOLLEY

Good morning Mr. Secretary. The administration has chosen not to pursue a deep geological repository at Yucca Mountain. Can you tell us briefly what tangible steps are being pursued for a development of a repository and do you feel that it is important for the US to have active efforts to develop repository to encourage other countries to do so or is it sufficient to say do as I say, not do as I do.

ERNEST MONIZ

Well as I said in my remarks the developing and carrying through on used nuclear fuel and high level waste disposition is quite important. It is obviously important for nuclear power but it also has perhaps in second order at least a non-proliferation implication. Things like fuel leasing obviously cannot be carried out without a suitable disposal pathway. Now what we are doing, and both are doing now and have in our FISCAL year 16 budget is fundamental to move forward our agenda that was set out by the Blue Ribbon Commission on America's nuclear future and then by the administration Statement of Policy in January 2013. It has a number of components, a very important one is moving – we would like to say promptly towards a consolidated storage, dry cast storage of fuel.

Last year such an initiative did pass the Senate. I believe there is interest in revisiting that again this year and we hope to get it across the finish line. With regards to also on high-level waste, you should note that we did put out a report last fall, October I believe it was, on the issues of looking at specific disposal pathways for high-level waste from the nuclear weapons program. Things like, it could be deep borehole approach, for example, for cesium strontium capsules from Hanford.

Very importantly I think an FY 16 budget in addition to carrying on the technology development characterisation work for three different geological media. We have in there about 30 million dollars to advance you might say generic activities towards consent based nuclear disposed facilities. We remain convinced, as was the Blue Ribbon Commission, that the only way we are going to get over the finish line is through consent based process and we will start a set of generic activities with the FY 16 budget.

TOBY DALTON

Thank you, in the middle here please.

WARREN STERN

Brookhaven National Laboratory. Thank you Mr. Secretary for an excellent introduction which addressed a range of topics from safety, security, non-proliferation emergency response. In the bureaucracy each of these topics is often addressed separately. Indeed you talked about the Ukraine Fuels Qualification Program and the Spent Fuel Storage Program which were part of our Nuclear Safety Program. And often there is not interaction between the various disciplines. But as you noted they are all need to be integrated in policy. What are you doing to make sure that at DOE that each of these topics are integrated into nuclear whole if you will, that they work together in a synergistic way?

ERNEST MONIZ

Well two things that I already mentioned in my remarks. One is the reorganization of the non-proliferation office, including the integration into it of some of the common terrorism and nuclear response efforts. The organisation is now much more along functional lines. Some people were unhappy that some of their favourite names may not be so prominent anymore. But if you look at that I think you will see a very logical kind of functional organisation. But secondly, I do want to emphases again the nuclear policy council that we've created recently. We've had one quarterly meeting so far and there have been some taskings, it explicitly recognizes the issue that you have raised. And like I said when we look at all things nuclear, all three of our Under Secretaries have major responsibilities, it is not just NNSA. So this provides in our forum where we are specifically looking at how we draw upon our capabilities, many of which are in the labs, to look at cross cutting issues. Again the obvious one I discussed today, the nuclear fuel cycle, is both a nuclear energy and a nuclear security issue. And so now we have a

forum where we can look at this in a more integrated way across the enterprise and hopefully that will lead to some specific actions in gaps that otherwise might have existed.

JEFF BRUMFIELD

With National Public Radio. I was wondering with what technical aspect of the Iranian program has taken up most of your department's time or what has required the most analysis? And then also what aspect of the program worries you personally the most?

ERNEST MONIZ

Sorry, could you please repeat the last part?

JEFF BRUMFRIELD

Sure, so the first part is just what technical aspect has taken the most time and then what part of the program worries you personally the most?

ERNEST MONIZ

Well let me just say that there are, we have always said there are multiple pathways to weapons should Iran chose to pursue them: two involving uranium and one involving plutonium and one in terms of covert activities. So that is the way the racket has been done. We cannot emphasis one over another, we need to address all of these pathways and we are doing so. In terms of the technical dimensions, again I think it is pretty straightforward having said that. One is around enrichment and enrichment R&D, and the second is around reactor production of plutonium. So those are the technical dimensions that we have been analyzing, we are analyzing and that we are discussing. And that is really about as far as I will go at the moment.

TOBY DALTON

We will take one last question in the middle here and then unfortunately the Secretary will have to run.

François Gere

From France. Mr. Secretary you have mentioned the importance of nuclear facilities in Ukraine. Could you tell us in this country which is in a situation of serious military crises. What are the measures which has been taken or envisaged in order to secure nuclear facilities in that country against possible terrorist action or possible militia actions? Thank you.

ERNEST MONIZ

Well the physical protection of these facilities is largely the responsibility of the Ukraine government surely in the areas in which it has current control. We know there are obviously issues and challenges for the international community in terms of, let's say, safeguard certification in Crimea, for example, would be a rather difficult problem at the moment. What we have been involved in mainly is – one thing that I did not mention is that the department has worked very closely with other agencies as well of the government including FEMA, Red Cross etc. – the department has through its energy emergency response capability and I should also say, always in partnership with European commission, we helped the Ukraine government develop its energy contingency plan for the winter. This past winter and of course there will be remaining challenges going forwards. That is broad based, natural gas, electricity, coal supply, nuclear power.

In the nuclear realm the one tangible result has been the commitment to diversify the fuel supplies, I said, involving Westinghouse now producing fuel assemblies for Ukraine reactors.

TOBY DALTON

Well it is 9:45 and the Secretary has a hard stop. So please join me in thanking him for his time today.