



## **MINUTES**

**Tuesday, August 7, 2012**

**9:45 a.m. – 11:30 a.m.**

**Idaho State Capitol, West Wing 55 (700 W. Jefferson, Boise, ID)**

### **Commission Members in Attendance**

Chairman Jeff Sayer, Dept. of Commerce

John Grossenbacher, Idaho National Laboratory

John Kotek, Gallatin Public Affairs

President Duane Nellis, University of Idaho

John Chatburn, Office of Energy Resources

### **Welcome and Introductions**

Governor C.L. “Butch” Otter addressed the LINE Commission at the start of the meeting. He thanked the LINE Commission for taking on their responsibilities. In the Executive Order creating the LINE Commission, the Governor said he laid out areas he wanted the Commission to explore, but said he also wants the Commission to go beyond that. The Governor indicated that the Commission should feel no discomfort in letting him know if there is another approach or idea that it wants to take a look at. The Commission has the opportunity to create a future for the Lab that is secure and will maintain our leadership in the nation as the nuclear laboratory for the United States.

The Governor then welcomed Duane Nellis in Moscow and the participants in Idaho Falls and pointed out that this meeting was being held in an economical way through the Idaho Education Network. He said the state has been working diligently on this for the last five years, and put almost \$40 million into it. The technology has brought us together all over the state as it brings the Commission and members of the public together today.

The Governor then said it was his privilege to introduce the Assistant Secretary for Nuclear Energy, Dr. Peter B. Lyons, who was confirmed about 16 months ago. Prior to this appointment, he has a long history of service and knowledge of nuclear materials and a strong history of where we’ve been and where we have the potential to go. Dr. Lyons served as an NRC Commissioner and served for Senator Pete Dominici on Energy and Natural Resources Committee. From 1969 to 1996, he worked at Los Alamos National Lab and has a Ph.D.

### **Remarks by Assistant Secretary Peter Lyons**

Dr. Lyons thanked the Governor for his leadership in creating the LINE Commission and for the open, transparent way the Commission is doing its work. He appreciates the invitation to be here. He said it has been an honor to serve as the Assistant Secretary for Nuclear Energy. He supports nuclear energy very strongly as part of a clean energy portfolio goal for the U.S. and referred to it as part of the “all of the above” strategy in supporting all sources of clean energy.

Dr. Lyons reviewed the organization of the Department of Energy and where the Office of Nuclear Energy resides. He talked about other offices supporting NETL and NREL, but his office supports INL as the lead lab for nuclear research and development.

The overall budget for the Office of Nuclear energy is \$800 million out of a total DOE budget of over \$20 billion. Most of that goes toward national security and science. NE is a small part, but based on the President’s and Secretary’s comments, a very important part. NE is responsible for all the research, development and deployment for nuclear. There are a small number of national programs, but INL is the largest player.

Yucca Mountain was terminated and moved into the Office of Nuclear Energy under the fuel cycle R&D program. His office supports the 104 existing, operating plants. His office’s interest is in keeping them that way. They manage a light water reactor sustainability program where licenses are being renewed to 60 years. These programs are done jointly, and INL leads the activities on the existing plants. Developing the technologies to support existing plants is a significant resource for the nation. The second large area of focus is on new plants. Small Modular Reactors fall within this area. This is the area that houses the NP 2010 program that led to the licensing of the AP 1000. They are looking at research on sodium fast reactors, molten salt high temperature gas reactors. Those areas have significant involvement of the INL.

With the Blue Ribbon Commission recommendations, INL is and will continue to be a major player in fuel cycle development. Another important area is in non-proliferation. Nuclear power is expanding dramatically. There are 60-65 nuclear plants under construction around the world. Countries are expressing interest in moving into nuclear – but it has to be done without proliferation. INL is key in that.

Dr. Lyons discussed several “drivers” for NE’s programs, including Fukushima. During the accident, DOE mobilized incredible resources to help people of Japan. The team peaked at 45 people on the ground, but is now in a very different mode with the situation stabilized. They are assisting in cleanup, evaluation and remediation of that site.

INL is helping evaluate the details of that accident, and evaluate codes to see if they can predict that kind of accident and whether the response can be improved. The operators were overwhelmed. All of those plants were active plants that required operator actions to happen in a certain way under extraordinary circumstances. We need plants with passive safety systems. SMRs and smaller reactors will have passive safety systems.

In addition, another key area NE is exploring is “accident-tolerant fuels.” The fuel in Fukushima was the type that under accident conditions generates hydrogen. It did – and it exploded. It is possible to develop accident

tolerant fuels. This ties in with INL and two facilities for which Lyons has tremendous of support – TREAT and APEX.

SMR is a current driver in his program. SMR's are an alternative to large gigawatt plants like the AP 1000. There are cases where the small units make sense, but the big units make economic sense. SMRs are built in a factory and trucked and assembled on site. It offers opportunity for a utility to buy in bite size chunks what they need instead of a \$5-8 billion investment in large gigawatt plants. DOE is close to the end of a process to select two bids for a cost share program with the government to move ahead with licensing of a design.

Workforce is a current driver. Building the workforce is why DOE makes a \$200 million investment to universities in the area of nuclear R&D.

Dr. Lyons then discussed some of the challenges for nuclear energy.

Natural gas is very cheap. The country is seeing only the cheapest of the wells continuing to operate. Cheap gas is a key driver now.

In addition, there is no price on carbon. There is no recognition of the role carbon plays in climate change.

Issues with the federal budget also continue to have an impact. Lyons is doing his best to support two key facilities at INL. The new low-level waste disposal area shared between the Navy and the INL needs to be in operation by 2017. And, there are two key research facilities at INL that are essential. APEX will provide INL with an integrated capability to apply the latest technology and understand how the fuel performed and how it can be improved. TREAT was shut down a number of years ago, but NE has been putting money in to bring it back on line. It is essential to the development of accident-tolerant fuels – that is impossible without those two facilities. They will be important to the world. A number of countries have written in support of the restart of TREAT, and they have an interest in testing fuel to failure as you could measure how it fails in a safe, contained way.

There are extraordinarily important opportunities in accident-tolerant fuels. Idaho has a strong program and leads that effort. Idaho is building a library of irradiated materials. That library, combined with the state's willingness to allow small quantities in to support that facility, increases the ability of the Lab to support national and international efforts.

A new test reactor at the INL is Lyons' dream if the funding could be found in the federal budget. It could be a sodium cooled fast reactor, salt reactor, or HTGR.

Through the BRC, the nation needs consolidated storage and repository sites on the fastest schedule possible around the country. It points out the importance that any facility be sited on a consent-based process. The idea of forcing a facility on a state or community is foreign to the BRC and the thinking of the Department today.

Language supporting a pilot consolidated facility is in the appropriations bill now. The nation needs solutions to used fuel. The largest opportunity to INL and Idaho is the importance of finding that solution. INL has the research facilities that will be vital, but in the nearer term the country is going to have to come up with consolidated storage and a repository. There is \$27 billion in nuclear waste fund; recent bill in the Senate provides an approach on how money moving forward can be used for consolidated storage or a repository. Lyons believes there are opportunities for playing a strong role in management of used fuel. There will be a number of states seeking opportunities, and there will be substantial new funding available for work in that general area.

With that, Dr. Lyons indicated he was willing to spend the rest of his time responding to questions.

Question – My question goes back to Dr. Lyon’s days at Los Alamos and how effectively those labs incorporated university students and post-doctoral fellows. They did a good job of building that future workforce. Are there things that the Department or New Mexico did to facilitate that?

Dr. Lyons – They recognized the opportunity to provide core specialties to train individuals in the technologies used in nuclear fields. JC’s in New Mexico have strong programs in that area. UNM operates a branch college at Los Alamos. You have something like that in Idaho Falls. Universities are playing a key role in this. 20 percent of RD funding goes to University research programs that are competitively awarded.

Question – You mentioned that Yucca is not workable. Can you elaborate on that, why you view Yucca as not workable?

Dr. Lyons – He grew up and worked in Nevada. It’s important to understand the development of the political situation in Nevada. The construction of the necessary 300-mile railroad requires state permits, and it was not possible to get permits in Nevada. When they tried to get a water permit for drinking, they couldn’t get that approved either. The BRC laid out a very convincing path forward. One way of viewing the BRC recommendations is to recognize that Yucca is limited in the amount of used fuel it can accept. We need a second repository anyway because we already have more fuel than Yucca could accept. The courts deferred the decision back to Congress until December. Short of a legislative change to increase the capacity of Yucca, you need a second repository.

Question – Is there anything we as a Commission can recommend so we demonstrate the long-term view on our country and the world’s challenge?

Dr. Lyons – There’s been discussion of a clean energy standard. Such a standard could recognize the utilization of clean or cleaner fuels. Such clean energy standards, could recognize the benefits to the nation from diverse energy and clean energy sources. Certainly that would include renewable, and efficiency, and clean coal options, but recognition at the state and federal level of the long-term benefits of having diverse energy sources are steps in a positive direction.

Question – One of the biggest challenges is to identify how we can play into the recommendations of the BRC. You have an interesting vantage point that would be helpful – can you speak to how other states are responding to BRC’s recommendation on consent-based regional storage?

Dr. Lyons – If the language in the Senate bill is to become law, for FY13 that would require that we move ahead with a pilot demonstration facility to accept fuel from decommissioned sites. The only remnant of nuclear activity at those sites are guarded dry cask storage, and there is strong interest in removing that fuel to a consolidated site and returning to full effective use by those communities. If that moves ahead, we would ask for expressions of interest from states. Four have already expressed interest, but he is not at liberty to identify those states. The largest opportunity for significant budget and mission growth at INL and Idaho in general would involve the back end of the fuel cycle.

Question – Regarding tech transfer and the New Mexico labs. Do you have suggestions that we might look at or recommendations that the state could take to enable tech transfer?

Dr. Lyons – There is a challenge of identifying sources of funding for small businesses for start ups. There is a valley of death between time of conception of an idea and its reduction to commercial reality. This valley of death is recognizing the significant financial resources to bridge from a technology on a bench in a laboratory to a product that is being sold. There can be roles for the state to encourage technology commercialization

Question – Why is it in the national interest that a federal agency be conducting the type of work done at INL?

Dr. Lyons – The drivers from a shareholder perspective are going to be on short-term returns. If one is looking only from a perspective of what will get the utility shareholder a return the fastest, it will be the quickest, cheapest solution that will make the most money. Right now that’s natural gas. That type of mentality makes it extraordinarily difficult to look at advanced, cleaner and long-term technologies. The government has an important role in developing and answering the longer-term questions and to do enough in the development in the longer-term options so they can be used by utilities.

Question – Regarding the cost share on licensing of two small modular reactors, has there been any thought to investigate one of those at INL to generate onsite energy needed by the lab.

Dr. Lyons – The current program is to take two technologies through design certification at the NRC, involve a utility and vendor and they propose a site. Consideration will be given to supplying power to government facilities. They are right in the middle of this procurement, so he is limited in what he can say; we tried to build into the procurement ability for bidders for this type of scenario. One of their dreams is that SMRs become a made in America industry.

Question – Reactor components of the AP 1000 are not manufactured in US. We have 104 reactors, performing at a high level, but what is the state of the industrial enterprises that created this industry in the US and around the world?

Dr. Lyons – There is no capability in the US to make the large forging for the pressure vessels of these large plants. Japan Steel Works and Dusan Iron Works in Korea are the prime sources for the US construction. Until we demonstrate there are far more opportunities than the four under construction today, it's not going to generate interest in the large forging industry. The vision for SMRs has smaller components, meant as completely made in America.

Question – From your perspective, what are the risks and vulnerabilities associated in this age where we worry about terrorist attacks?

Dr. Lyons – At NRC, he worked security issues with all the plants and witnessed force on force exercises. Any terrorist, who considers attacking should think twice. Our plants are exceedingly well-guarded. NRC didn't have responsibility over DOE sites, but INL has one that performs superbly.

One attribute of the SMR is that most designs can be sited underground. That offers benefits from many perspectives including security. You can take a blank sheet of paper to control access with most modern technologies.

Dr. Lyons mentioned that the power supply for the Curiosity Rover that just landed on Mars came from INL. The country is proud of this and he wanted to extend congratulations. Extend to other labs as well, worked together to provide power sources. This is the 50<sup>th</sup> anniversary of nuclear power in space. Many, many missions have had nuclear power in space. The rover that landed in a most impressive landing sequence and currently on Mars is the latest manifestation of that capability. Those missions would be out of the question without nuclear power.

Question – If you were Governor Lyons and we were your cabinet or your LINE Commission, what would you have us working on?

Dr. Lyons said he would start with the importance of your educational system, making sure that you have a strong system to prepare graduates with an appreciation of high technology specialties. Instill in them a love for the West and Idaho and give them an interest in staying in Idaho.

INL is a tremendous resource for the state. As the lead lab for nuclear power, it is a vital asset and resource. There has been interest in commercial nuclear in Idaho, but there isn't at this point. To the extent that Idaho could move ahead with any technologies, he thinks that would be very positive. The support that Idaho provided for the Areva facility and the federal government provided loan guarantee could be an important contributor to increasing the range of nuclear facilities and well-trained nuclear experts within the state. SMRs on local sites is also a potential for the state.

Looking at opportunities out of BRC is the largest single opportunity. Whether it is consolidated storage, or a repository, you must also have a good understanding of what those risks are that are involved. I think communities that do move ahead with consolidated storage and repositories have an opportunity to use that as a springboard to a high tech future and a substantial manufacturing capability. If you look at the number of

different tools, installations and equipment that are required for consolidated storage or repository there are risks – but they are well understood, well quantified, well contained.

Dr. Lyons thanked the Commission for the opportunity to talk with them. There are some wonderful assets in the state, and he appreciates the way the state is approaching this in an open public transparent way – this is the only way to build public understanding.