



**MINTUES**

**Thursday, May 16<sup>th</sup> 2019**

INL Meeting Center

775 MK Simpson Blvd Idaho Falls, ID 83401 (Formerly University Blvd)

9:00 am – 3:00 pm

Commission Members in Attendance:	Tom Kealey
Bobbi Jo Meuleman, Co-Chair	John Grossenbacher
Rebecca Casper	John Tippets
Rose Bernal	Fred Hughes
Joe Weismann	Scott Snyder
Jim Woodward	
Paul Arrington	
Janet Nelson	
John Chatburn	Staff:
Harold Blackman	John Revier
Brian Wonderlich	Elli Brown
Wendy Horman	Nate Fisher Jr
Scott Bedke	

**Call to Order**

Co-Chairman Bobbi Jo Meuleman called the meeting to order at 9:04 a.m.

**Welcome and Introductions**

Governor Little issued a new Executive Order for LINE, No.2019-05. Language online. Different administration, different approach to oversight and involvement. LINE is now housed within Governor’s Office. Welcome new commissioners: Sen. Jim Woodward, Brian Wonderlich, John Chatburn.

**Rebecca Casper moved to approve the minutes from January 23, 2019.** Seconded by Janet Nelson. All in favor. **Motion approved.**

**DOE Idaho Operations Office Overview** by Bob Boston, Manager, Idaho Operations, DOE ID. See PowerPoint.

*Tippets* –We are familiar with SMRs but not as familiar with microreactors. Can you give us a bit of insight on size and application on these reactors? Power generation or other applications?

A: It’s not well defined. There’s a request for solicitation out, and there hasn’t been a decision about where these will go, but their concept is as a mobile/remote reactor. Will be built remotely, bring to Idaho, assemble in Idaho, operate for some time and then move elsewhere. As it relates to military bases, this could serve as an alternative to diesel fuel.

*Weismann* – Is High Assay Low Enriched Uranium Fuel (HALEU) different than traditional Low Enriched Uranium (LEU) fuel?

A: Anything above 20% is high enriched uranium, anything below is low enriched uranium. We are not enriching to make HALEU, would be down blending current stocks.

*Kealey* – Is there enough talent in the Idaho Falls areas to support all of the new and exciting projects on such an aggressive timeline?

A: Staff talent has been identified as highest risk to the future of the lab, but they are taking the necessary actions to address the needs.

*Grossenbacher* – Within DOE is there discussion where private sector fusion experiments will go? Appears there is a lot of money, people and experiments that are big enough they will need different locations.

A: Those discussions would take place in Office of Science, then will work with Office of Nuclear Energy. To our knowledge they have not been addressed yet.

*Grossenbacher* - Anything we can do from a state perspective to support the long-term viability of the laboratory and its mission?

A: We're lucky to have a strong working relationship, appreciate the relationship with the state and local communities. They hold us to task in our missions – clean up and research and development. LINE commission is a great way to inform the public and facilitate conversation.

*Snyder* – We (Idaho Universities) want to be part of the workforce solution with DOE and INL to train students and future workforce. Do you see specific actions we can take?

A: The role of the universities is critical. We want global talent, however, we've found bringing in local talent means they will stay longer term. Local universities need stronger engagement – internships, etc. Better communication, on both sides, is necessary to market and advertise employment opportunities at INL.

*Horman* – The 2020 Career Technical Education (CTE) state budget had a line item specific to NQA1 funding. This will allow an expansion of local programs to keep and retain students to assist workforce need. In addition, the legislature has made large investments in the STEM Action Center. So while the bottom line to universities didn't increase a lot, there were targeted investments made that support efforts such as these and seems like a good opportunity to leverage relationships going forward.

**DOE ID Cleanup Update** by Jack Zimmerman, DOE ID. See PowerPoint.

*Tippets* – Is this the last simulant run for IWTU? Do you believe so far this simulant hasn't led to another need for an additional simulant run?

A: Yes, that is the plan now. However, they need to fully evaluate the data from the simulant run once it's complete.

*Tippets* - You seemed confident the issue with filters is resolved, is that correct?

A: Yes.

*Kealey* – Can you define the split between EM (Environmental Management) and NE (Nuclear Energy)?

A: EM (Cleanup) annual budget is \$430M annually. NE (DOE ID) is \$1.4B annually.

*Casper* – ARP V accident took place over a year ago, do you have the final report on the accident available?

A: Inspection report was finalized in fall of 2018. Available on CAB and Fluor website.

*Grossenbacher* – Long-term environmental monitoring programs will exist into the foreseeable future. This work has been done through contractors. Maybe we should consider utilizing an in-state institution to keep Idahoans informed. Idaho Universities could potentially build those capabilities. Have you explored this option?

A: Have not thought about it in the short-term. DEQ does some independent monitoring. Grant goes to Shoshone-Bannock Tribes for some monitoring. Could consider a different approach for the future. EM will go away in the future and could become a lab mission.

*Horman* – Can you provide high level overview of cleanup contract structure?

A: Fluor Idaho signed a 5-year, \$1.8 B contract. No option for extension. Beginning stages of progress to address the next contract that runs through May 2021.

*Meuleman*: We appreciate the open lines of communication between DOE, Governor's Office, and AG's Office.

10:10 am – 10:20 am Break

### **RDD&D Subcommittee Panels**

#### **Panel One: Versatile Test Reactor (VTR):**

Panelists:

- Bob Boston (DOE ID Manager, Idaho Operations)
- Tom O'Connor (Director, Office of Advanced Reactor Deployment, Office of Nuclear Energy)
- John Baumgardner (Director, Advanced Nuclear Facilities R&D)
- John Kotek (Vice President of Policy Development and Public Affairs, Nuclear Energy Institute), Moderator

Kotek: One of the primary roles of NE and the laboratory system is to provide big science tools. VTR is part of that obligation. So, what is it? What role would it play? What gap would it fill?

O'Connell: fundamentally there is very little difference between ATR, but with a much higher electron flow. With these capabilities we will be able to conduct more diverse tests than ATR. It's an important tool for both designers and regulatory structure.

Kotek: Talk about technology structure, and what water use looks like

Baumgardner: Design is very similar to other reactors that have been sited at INL – EBRI and EBRII. Will be a sodium-cooled reactor. Important attribute from a safety perspective.

Kotek: Where will DOE build this proposed reactor and what does the process look like?

Boston: Brought in a sub-contractor who is looking at NEPA process

O'Connell: EIS in process, which is an important step to look at holistic view of impacts. INL is a contender for the VTR, but other sites must be considered to comply with EIS. A key piece is evaluating post-irradiation capabilities of different facilities.

Kotek: How are we building on past experiences with the Prism design (sodium-cooled fast reactor)?

Baumgardner: Roughly \$1 billion dollars was spent on the Prism design in the 80's/90's. It was state of the art at the time. We're looking into some modifications, but much of the original design is still solid. Differences include non-steam generator on VTR. It will dump directly into air because its main purpose is a research reactor. Currently reaching out to industry and contractors who designed Prism to leverage their knowledge.

*Tippets* – Is it anticipated that the VTR will utilize spent nuclear fuel? If so, would the current ISA be impacted by that?

Boston: No. SNF will not be used.

*Blackman* – What about the risk assessments, what do they look like? Have you thought about the disposition of fuel?

Baumgardner: NRC has looked at risk assessment, and that is the only report I'm aware of. Assessment was done on prism reactor, and we are leveraging all that information, which is part of licensing modernization.

Boston: Part of EIS is looking at fuel disposition (cradle to grave) – currently reviewing.

*Kealey*- Will this add or take away from target dates on other projects?

O'Connell: Draw a parallel to what Navy is currently doing. Relative to other reactors, there is no impact, but utilizing VTR could benefit other ongoing efforts. We are behind on talent at INL for VTR and need to work on that. However, having a physical reactor sparks the interest, excitement and passion in the students

*Grossenbacher* – Discuss the main risks: technical risks, licensing risk, financial risk then becomes political risk. How big of a lift is this, relative to the current DOE budget? Is the manufacturing of fuel going to be difficult?

Baumgardner: Technical risk - risk is smaller, fuel is available, and data is available. Balance of technology is very simple and low-tech which helps. The part of the plan that's complicated is experiments, but they are very controlled so we can mitigate that.

Boston: Licensing – we have great experience onsite. When the lab was consolidated we took over some facilities that had legacy licenses and spent a long time getting those up to speed, had to relicense other site areas. With that we have a lot of experience. Biggest licensing risk is lack of qualified, technical individuals. We have a highly qualified sub-contractor, but are generally short on talent.

O'Connell: Licensing – the relationship with DOE should benefit us with process. We have an MOU signed with NRC if needed for regulatory assistance. Addressing the “heavy lift” – will be very difficult to begin with. The cost estimated for this has already been factored in by DOE, they have signed off on the concept of this project. We received significant budget increases from Congress aside from the president's proposed budget. We have a lot of support for this, but we must meet milestone and marks to justify the investments.

Baumgardner: This provides us the opportunity to look nationwide and engage a broad community at different labs to work with.

*Casper* – Can you talk about the international opportunities and relationships this project could provide? Potential customers?

O'Connell: The US has had fast reactor technology previously. Japan has similar technology but both are inactive or on that path. France has limited capabilities, as does India. We are in the process of developing MOUs with Korea, Japan, and France to talk about considerations and form working relationships. Looking internationally, we have a lot of opportunity because many other nuclear countries don't have similar capabilities.

Boston: Our intent is to be good stewards of public money and support. We are committed to safety.

*Arrington* - Will VTR use water and how much? How do you consider how you'll use water on projects like this?

Baumgartner: We don't anticipate using much water for VTR due to its ability to use sodium as a coolant. Very little water is used other than for support functions.

Boston: We talk often to the state when discussing new projects and water rights. We are in regular discussions.

*Grossenbacher* - I suggest and ask you to think about considering folks in Idaho who are experts. Partnerships with folks in state ensure public confidence and trust. Keep it local. Is there a relationship that could/should be developed with licensing authority and the state?

Boston: That's an excellent suggestion. We will look into it. We work frequently with the universities, but increased partnership is always beneficial.

## **Panel Two: MicroReactors**

Panelists:

- John Wagner (Associate Laboratory Director, Nuclear Science & Technology)
- Shannon Braggs-Sitton (National Technical Director, Integrated Nuclear-Renewable Energy Systems Manager, Systems Integration, Nuclear Science & Technology)
- John Kotek (Vice President of Policy Development and Public Affairs, Nuclear Energy Institute), Moderator

Kotek: New reactors need infrastructure and expertise to demonstrate their technologies. INL is returning to its roots of testing technologies at full scale. Microreactors are another example of an emerging technology that could be tested at the site. So, what is a microreactor? How is it different than a traditional reactor?

Braggs-Sitton: Microreactors are on the order of megawatt scale, made in factory, assembled in factory. Require minimal site preparation. Industrial use could be: mining, residential, military. We can transport and move the reactor to multiple sites and remote areas. They require minimal installation, are self-autonomous, easier to use and configure.

Wagner: The microreactors go in the opposite direction of a traditional reactor -- we'd been looking at developing bigger and bigger reactors to capitalize on economies of scale. This goes the other way, to something that simply can be delivered and set up. We are working to remove the risk so that the potential for any release of radioactive material is much smaller. Low power density. The size "micro" is somewhat misleading. They are small, but not miniscule, can fit on a truck bed.

Kotek: Are you saying that this is 1/10 or 1/100 the size of a commercial reactor accurate?

Wagner: Yes

Kotek: What is driving interest in this model?

Wagner: Interest from remote communities both in US and internationally. Things like mines, military bases, and other remote areas that need better access to power than using and relying on diesel. These are designed to not need refueling for 10 or more years – so they offer a consistent, long-term solution for energy.

Kotek: What about timelines?

Braggs-Sitton: We are talking about starting demonstrations with these in 3-5 years. The licensing for these could be tricky. They'd likely be NRC licensed, but would need to work with the military for other applications.

Wagner: There are a lot of aggressive timelines being discussed. There are some critical pathways and elements to consider: access to HALEU, fabrication of the fuel and licensing of the technology.

Kotek: HALEU is not commercially available in USA. What can we do?

Wagner: You can enrich, and DOE is working on a project to do this. Another way, which is a likely pathway, is that the DOD would get HALEU and down-blend it. A third option is to recover high-enriched uranium and then down-blend it. Those decisions will be made at a later date.

*Meuleman* – What could the state be doing to help advance this project?

Kotek: Continuing LINE Commission, this group has been very beneficial. Many companies are committing to using clean energy and nuclear is by far the leading source of clean energy in the US. Many companies in Idaho are starting to make commitments to utilizing clean energy (Chobani, Cliff Bar, HP, Idaho Power), likely due to the fact that much of Idaho's power is so clean already. The state should continue to use tax incentives and other measures to preserve the competitive advantage we already have in clean energy development.

Wagner: There is no microreactor supply chain, no support system, no supply chain for HALEU – all opportunities for Idaho. Question now is who takes opportunity? Continuing stakeholder engagement is key to ensure buy-in. The state should continue to work on focused workforce development and work on resident talent pool.

*Tippets* – Are we creating increased opportunities for attacks/sabotage by moving reactors to remote areas? What environmental risks does this pose?

Wagner: These systems will not be deployed unless they meet rigorous standards or they will not be licensed. Additionally, the risks are fairly small as is. The fuel levels is very small already which should help mitigate and assuage environmental concerns. We have regulations in place and will need to follow them.

*Kealey* – What is the market size? Cost? Is the supply chain starting to form?

Bragg-Sitton: We are right at the cusp of determining market size and potential as we speak. The price point will be higher than traditional residential power because of use, location. We are not behind on supply chain, it is developing now.

Wagner: NEI recently put out a study regarding this market. Market will depend on cost. Remote areas will differ greatly from more urban areas in needs and in cost savings/projections. It remains to be seen how big this can be, but I expect it will be quite large. Remote or mainstream – demonstration becomes so important to prove technology. Remote and autonomous is necessary. Driving down cost of HALEU is another key. The reactor types look different and the supply chain needs depend on technologies, so it is still evolving.

*Casper* – What will the impacts of plant closures be to the nationwide fleet and talent pool? Where do microreactors play into these closures?

Bragg-Sitton: It's concerning when these facilities closedown prior to licenses expiring. We need to look at how to keep such facilities economically viable, and these reactors could aid some of that. SMR and microreactors are more flexible to fit within renewables and support grid and other applications. In some cases these have more of an opportunity internationally than in the US to provide a clean supply of water or other alternative applications.

Kotek: That begs the question of where our industry is headed, and it's a necessary conversation. Proving there is a bright future is critical going forward.

*Bernal* - How much power can a microreactor produce?

Bragg-Sitton: It depends, 1-15 megawatts seems to be the closest estimate. 5 to 10 megawatts electric might be a standard size. Most importantly, can they meet the other requirements: transportation, assembly, scalability?

Wagner: Think about it fitting on the back of a truck bed or railcar (that includes shielding). That's what defines this class of reactors instead of power – once on site are you assembling instead of constructing?

*Break for Lunch*

**Utah Associated Municipal Power Systems (UAMPS) and NuScale Carbon Free Power Project Update** by Doug Hunter, CEO, Utah Associated Municipal Power Systems (UAMPS) and Chris Colbert. See PowerPoint.

**Idaho Falls Power Overview and Carbon Free Power Project perspective** by Bear Prairie, General Manager, Idaho Falls Power. See PowerPoint.

*Weismann* – Was the \$1,000 price point because of the polar vortex this spring?

A; Yes, it was Pacific Northwest and Canada and lasted longer than a normal polar vortex

*Weismann* - \$1,000 vs \$35 is a huge disparity – how often do you see costs somewhere between the two prices?

A: Leading up to 2007, gas prices started to jump up to \$100 range, then dropped due to increased supply of natural gas (fracking). First time for \$1,000 since 2001, but trending to higher prices – duration and frequency. We are moving to an era of being resource constrained.

*Casper* – Why is the SMR project a good fit for the Idaho Falls Power portfolio? What was the decision-making process?

A: Idaho Falls Power is currently 100% clean energy and would like to stay on that course if possible. We see nuclear as a dispatchable resource and see an increased risk with natural gas (price and accessibility).

*Chatburn:* How much did the Idaho pipeline capacity figure into decisions on natural gas?

A: We looked at a number of things and it ultimately came down to constraints and fuel risks. We see that the pipeline is constrained and will only get more constrained.

**REDI Presentation** by Dana Kirkham, CEO, REDI. See PowerPoint.

*Tippets* – 82% of power generated from renewable, what percentage of renewable is consumed vs produced in Idaho?

A: Chatburn: large amount of power generated in Idaho isn't consumed in Idaho. However, our portfolio continues to get cleaner. Will follow up with specific figures.

### **Subcommittee Updates**

RDD&D, Peters: Coordinated VTR and Microreactor panels in the morning session

Safety Risk and Environment, Blackman: Distributed five draft waste stream white papers (sodium bearing waste, remote handled mixed low level waste, transuranic waste, spent nuclear fuel, calcine) Commissioners should take time to review and send feedback to Governor's Office or Harold Blackman.

Education and Workforce, Aman: Degrees and workforce certifications are two main focuses of subcommittee. Additionally, supported the NQA1 funding from State of Idaho for curriculum development and training.

*Nelson* – As mentioned, workforce is the greatest risk so it is great you are focused on this issue. How can universities join forces to make an impact?

A: Starts at the top with the presidents. They must understand how important energy and the nuclear field is to Idaho. Have a great opportunity with new leadership at all three institutions to educate them early on the importance.

*Horman* – Adding to response: we are sitting between two examples: CAES and Cybercore/C3. We have a common cause and has united the universities working together and collaborating. Models do exist to solve the problems of today's employers.

### **Public Comment Period**

Kurt Hammon – Idaho Falls resident and stakeholder in Carbon Free Power Project. In 2016 it was mentioned there was a need for diversity in voices and what should commissioners be studying (per LINE meeting minutes on website). Educational materials for those members that may be interested in learning more about the SMR Project, the history of the commercial nuclear industry and list of economic references can be found here: <https://tinyurl.com/yxn49v6w>.

Tammy Thatcher – Idaho Falls resident. This commission only looks at the most optimistic views and not the realities or the cancer causes, the contaminated fuel, and the dangers of nuclear energy. Yucca Mountain was mentioned but no real issues addresses. While buried waste is almost completed at ICP, they still leave acres left of waste buried. Carbon Free Power Project prices aren't locked in – comparisons are only from a favorable view. Is nuclear energy the best thing for the citizens of Idaho?

### **Commission Discussion**

*Kealey* – Have we looked at other commissions or councils on promotion, supply chain or workforce? Can we learn anything or implement what others are doing? Department of Commerce would be glad to support the research on what others are doing.

*Horman* – Update on Energy and Technology Caucus: Held two meetings during legislative session and hosted a tour of INL. Excited about the potential to help get the word out about work at the lab and what is taking place throughout Idaho. We are watching the Pennsylvania nuclear caucus and their actions. We believe it is a good platform to educate on a statewide approach.

### **Closing Comments**

- INL 70<sup>th</sup> Anniversary – August 14<sup>th</sup>
- Next Meeting: October 2<sup>nd</sup>, Sun Valley
- Letters in commissioners packets: Versatile Test Reactor Support Letters: Governor Little, Speaker Bedke & Pro Tem Hill, Mayor Casper, DRINC (Directed Research Institute for Clean Water) Support Letter: Governor Little, Utah expansion of collaboration to Idaho & Utah Delegations: Dr. Peters, Idaho to Join Cyberstart Press Release: Governor Little

### **Adjournment**

Co-Chairman Bobbi Jo Meuleman adjourned the meeting at 2:41pm.