WM2016 Conference Panel Report

PANEL SESSION 54: **UK/USA/Canada Partnering – Accomplishments and Lessons Learned**

Session co-chairs: **John Mathieson**, *Nuclear Decommissioning Authority (NDA), (UK)*
Laurie Judd, *Longenecker & Associates*

Panel reporter: **Christine Fahey**, Canadian Nuclear Laboratories (CNL)

Panelists:

1. **Rodrigo Romando Jr**., *Senior Technical Advisor, United States Department of Energy – Environmental Management (US DOE-EM),*
2. **Graham Jonsson**, *National Programme Manager (Intermediate-Level Waste and Nuclear Material), NDA (UK)*
3. **Richard Sexton**, *Vice-President Decommissioning & Waste Management, Atomic Energy of Canada Ltd. (AECL)*
4. **Anthony Banford**, *Chief Technologist, Waste Management & Decommissioning, National Nuclear Laboratory (NNL) (UK)*
5. **Brian Wilcox**, *Director, Whiteshell Laboratories Closure Project, CNL*
6. **Pamela Marks**, *Federal Project Director for Salt Waste Processing Facility, US DOE-EM, Savannah River National Laboratory (SRNL)*
7. **Jeff Griffin**, *Associate Laboratory Director, SRNL*

Summary of Presentations:

As the United States faces its toughest environmental management challenges, the United Kingdom adjusts its approach to remediation and Canada adopts a serious clean-up posture, collaborating on solutions and sharing of lessons learned has never been more important than it is at present. Under the umbrella of three Statements of Intent to cooperate, signed bilaterally by the governments of each of the countries represented on this panel, dialogue and partnership among Canada, the UK and the US has been greatly enabled. As evidenced by the presentations of the panellists, the value of the international cooperation is increasing as the relationships mature and deepen among the parties involve mature.

The initial speaker, **Rodrigo V. Romando Jr.**, noted that the nearly ten-year old relationship between the US DOE and the UK NDA, has never been stronger and serves as a model for other partnership agreements. Originally between the NDA and the US DOE-EM, the most recent renewal of the agreement expanded the partnership to additionally include both the US DOE's Nuclear Energy department and the UK's National Nuclear Laboratory. Mr. Rodrigo highlighted the similarity of the US and UK programs in scope and scale as well as hazards and risks. He pointed to four ways in which knowledge is shared, including; 1) reports; 2) new technology development and deployment; 3) university student hosting assignments; and 4) relationships built through site and facility visits, workshops and personnel assignments.

Through knowledge sharing under the agreements, Mr. Romando concluded the US and UK are making strides in executing their respective missions.

Graham Jonsson, lead for the decommissioning of the UK's largest and most complex site at Sellafield, noted his emphasis on program and project management and keen interest in driving value for money and demonstrating this to the taxpayer. To that end, Graham spoke of a week-long trip made in advance of the WMS 2016 by NDA chairman, John Clarke, to explore ways the NDA and the DOE can leverage the similarities in the most difficult challenges they respectively face and work more closely with US counterparts to solve them. Mr. Jonsson also noted the value of current talks with Canada and other countries on the remediation of boreholes and of ongoing cooperation with the Savannah River National Laboratory on the Salt Waste Processing Facility (see Ms. Marks' summary below).

The third panellist, **Richard Sexton**, focused on the recent changes to AECL as a result of the recent adoption of the Government-owned, Contractor-operated (GoCo) operating model. He explained that the 10-year journey to GoCo was driven by the need to tackle the legacy liability – now C $10 billion – and has resulted in a model similar to that in the UK, in that AECL is the NDA equivalent, with each reporting to a federal government department, the GoCo contractor, Canadian National Energy Alliance, is the Parent Body Organization and CNL is the Enduring Entity. As the new model is but six months old (took effect 2015 September), AECL and CNL - its former subsidiary - are forming a new relationship and jointly focused on CNL's three missions: Science & Technology, Decommissioning & Waste Management (DWM), and capital renewal. Mr. Sexton advised there will be a step change in the volume of DWM at CNL and acknowledged that the Canada's partnering agreements with the US and UK will be exercised more as solutions are progressed for decommissioning, remediation and near surface waste disposal.

Anthony Banford described the UK's NNL as the principal research and development organization that underpins the UK's national nuclear programmes. He noted that the NNL operates in the mid range (4-6) of the Technology Readiness Level scale and is connected to work led primarily by universities on the lower range and industry at the upper range of the scale. Among the NNL's areas of focus are robotics manipulations technologies for sorting and segregating materials and laser cutting and thermal treatment technologies. Mr. Banford noted that NNL serves as a hub for bringing academics together to solve tough problems together and while currently domestically centred, an effort is underway to expand collaborations internationally. He highlighted successful exchanges on glass collaborations with the SRNL and on decontamination fixatives and fogging/misting technology with the Idaho National Laboratory. He indicated the NNL is looking to expand its collaborations in areas addressing groundwater cleanup, inspection and characterization, and black cell operations.

Brian Wilcox, the fifth speaker, concentrated his presentation on how Whiteshell Laboratories benefits from collaborations as it undertakes closure of CNL's second largest nuclear research site. Among the closure challenges are the safe recovery of wastes from tile holes (stand pipes) and their repackaging for shipment to Chalk River Laboratories. Mr. Wilcox credited the collaboration agreements for enabling dialogue with peers in the US, UK and other countries that face similar challenges, including recovery hazards such as hydrogen gas. Mr. Wilcox underscored the value of building relationships through site visits and conferences, noting that the personal connections formed foster dialogue that leads to cooperation and collaboration. Looking forward, Mr. Wilcox, identified CNL interest in collaborating with the US and UK on topics including: best practices in characterization, remote handling equipment, mixed waste disposition, reactor entombment, and hot cell refurbishment.

The focus of the remarks by **Pamela Marks**, were the cooperation between the US and UK on the start-up and commissioning of two similar plants at SRNL and at Sellafield required to process liquid waste. Both projects had late engineering changes and were re-baselined because they were significantly behind schedule and over budget. Ms. Marks noted the SRNL's Salt Waste Processing Facility is about three years late relative to plan; however, construction is nearing completion, inactive commissioning is underway in some areas, and system testing is to begin in 2017, with hot commissioning in 2019, and regular operations in 2020. In terms of lessons learned to date, the main ones have been to: 1) ensure design requirements are well-defined and adhered to throughout the project; 2) revisit design assumptions often; 3) perform large-scale testing for first-of-a-kind technologies; and 4) pay greater attention to supplier evaluations and to plan within their limitations. Ms. Marks also observed that lessons have been shared between the US and UK mainly through reports and, as such, have been retrospective. She emphasized the need for both project teams to be more forward looking and to work collaboratively in anticipating issues so the learning is more dynamic and less static.

The final panellist, **Jeff Griffin**, began by concluding that at the foundation of collaborations are relationships. In his presentation, he described the technical and programmatic issues faced at SRNL relating to waste cleanup and fuel cycle technologies and identified four aspects of collaborations that are important in addressing them. These aspects include: 1) sharing of ideas to stimulate innovation of for mutual benefit; 2) leveraging complimentary capabilities to avoid duplication of effort; 3) sharing actual experiences and lessons learned from them; 4) developing the next generation of engineers and scientists cooperatively. Mr. Griffin provided examples of SRNL collaborations with the UK on waste forms, material processing and waste management and spoke of two workshops held in 2014 and 2016. With Canada, through two technical exchanges, SRNL has collaborated on topics such as cementitious materials and insitu decommissioning. They are now working together on innovated remote system hardware to capture facility configurations in high hazard environments.

Discussion Among Panellists

Following the presentations, the session co-chairs facilitated a discussion among panelists. Mr. Griffin began by asking his fellow panellists for their views on the state of the workforce, retirement, and plans for the future. Mr. Sexton observed that workforce transitions will be occurring at CNL as the scope of the new GoCo contract is undertaken; 'retain-retrain-redeploy' is the principle being applied to the retention of highly qualified employees who currently work in facilities that will be closed. Mr. Romando recognized that some 40% of the workforce at US DOE national laboratories could retire today and the average age of workers is 54. He recognized that a more strategic approach to succession planning is needed. Mr. Banford sees the workforce issue as a shared problem that stems from the lack of new build and attraction of new blood to the nuclear industry. With both new build and accelerated D&D work on the horizon in the UK, he believes the current workforce issue will be exacerbated. Some of the solutions include graduate programs, research grants, the DISTINCTIVE program, and the skills academy. Mr. Jonsson identified the decline in the capabilities of the supply chain as a major concern, and noted, for example, that few contractors have the welding capability to meet nuclear standards.

Prompted by Session Co-chair Mr. Mathieson to address barriers to workforce issues and solutions, Mr. Romando recognized longer attachments of staff would be more effective than shorter exchanges and identified that the related travel costs would need to be built into budgets. Mr. Jonsson advised that Sellafield already does include the costs in its budget and takes the whole life-cycle into consideration. Mr. Griffin stated the importance of demonstrating the link between graduate programs and mission success over several years. Mr. Sexton suggested the UK has set the benchmark in terms of how to build and sustain capability and therefore has made the most progress to date. Session Co-chair Mr. Judd remarked that the DOE has 17 major procurements in the near term with a total value of US $500 million and could include workforce reinvigoration in the procurement requirements. Mr. Mathieson indicated the UK's *Energy Act* already requires such reinvigoration. Mr. Banford closed the discussion with the observation that truly collaborative projects, with parties seconded in from different sites, are essential to stimulate growth in capability and knowledge.

Initiated by Mr. Sexton, the second topic debated by panel members was management of intellectual property (IP) and the commercialization of technology. Mr. Judd stated that the contractor keeps the IP it brings to the contract; anything arising from the contract is the government's IP, however the contractor may use it. Mr. Mathieson spoke of a scenario when the US DOE and UK NDA had to step in and declare ownership of the IP, and direct that it be shared by its contractors. Mr. Judd expressed the view that AECL's IP terms are outdated. Mr. Sexton countered that this is a priority for AECL's lawyers.

Question and Answer

Two questions from audience members were fielded by panellists. The first focused on the impact of quality standards to mission delivery. Mr. Wilcox responded by confirming that Canada's regulatory regime is not prescriptive, noting that the licensee proposes an approach to the regulator and provides the rationale. It observed that in some cases, having more defined requirements would help assist project planning. Ms. Marks indicated the increase in the quality requirements for the Salt Waste Processing Facility relate to the underestimate of the nuclear consequences at the outset of the project. Mr. Jonsson observed that the over-specification of quality requirements has huge consequences for fabrication expenses. He cautioned that the highest quality standards (Grade 3 in UK) be set only when needed.

The second question concerned the NDA's new responsibilities for Sellafield resulting from recent NDA structural changes. Mr. Mathieson replied that the change is about the correct assignment of risk. Mr. Banford noted that the NNL is working closely with the NDA to demonstrate technologies to the point where contractors can take them on. Mr. Jonsson further elaborated that the NDA's initial strategy of contracting everything out for Sellafield was not quite right. There was too much uncertainty for that approach to work and NDA is now reducing the risk through work with strategic partners such as the NNL, and taking a gated approach to contracting. He suggested that Canada adopt a gate-review type of thinking as it implements its GoCo model. Mr. Sexton responded that AECL's strategy is about defining the "what" and letting the contractor determine the "how". He remarked that empowering the contractor to innovate and incentivizing them to do so in a variety of ways, is central to mission delivery.

Conclusion

In closing the panel, the Session Co-chairs concluded that international collaborations were never more important in dealing with challenging issues and thanked the panelists for sharing their insights. They also pointed out that further details on the UK and Canadian programs would be the subject of separate WM 2016 panel sessions.