Across The Pond

A Quarterly Update on Joint UK NDA/US DOE Activities and Initiatives

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US DOE and UK NDA Renew Information Exchange Agreement

The Statement of Intent (SOI) between the US Dept of Energy (DOE) and the UK Nuclear Decommissioning Authority (NDA) on decommissioning and waste management was renewed for a further five years during the Waste Management conference in Phoenix, AZ in March.

The signatories to the SOI were the DOE's Offices of Environmental Management (EM) and Nuclear Energy (NE) and the NDA, with NE being a new addition to the arrangement. The Office of Environment Management is responsible for the clean-up of the former nuclear weapons' sites and the relationship between them and the NDA has already resulted in collaboration in a number of areas such as thermal treatments for stabilization of wastes, plutonium management, aging facilities management, non-standard fuels disposition, glass chemistry, sodium passivation and decontamination technologies. The Office of Nuclear Energy responsibilities include fuel cycle activities, which also encompasses geological disposal and transport, and discussions will soon begin on identifying specific areas of mutual interest for collaboration.

The continuing relationship enables the sharing of lessons learned as well as the development and application of new technologies and approaches to improve the safety, cost-effectiveness and schedule of both programmes.

David Huizenga, DOE Senior Advisor for Environmental Management and Head of EM, said: "EM highly values international co-operation and we are eager to continue working with organisations in the UK to ensure this relationship is fruitful for both sides."

Mark Lesinski, NDA Executive Director for Delivery, added: "We are very pleased to extend the term of this agreement and look forward to working with our colleagues in both EM and NE in the coming months."

Peter Lyons, DOE Assistant Secretary for NE, stated: "We value the experience and partnership of scientists in the UK as we exchange technical information in this important programme."

Topic Area Update and Future Plans

Since the Statement of Intent between NDA and US DOE was signed in 2007, there have been a multitude of informal and formal interactions to exchange information and lessons learned in an effort to optimize the cleanup programs on both sides of the Atlantic. Indeed, significant information exchange and relationship building has taken place at multiple levels across multiple organizations with more than 120 individuals across NDA, DOE, the National Labs and Contractors being involved in one or more Conference Call, a Technical Exchange Meeting or a visit from NDA to DOE or vice versa.

These interchanges have covered a wide range of areas of interest to all parties including Spent (Used) Nuclear Fuel Management, Plutonium Management, Waste Processing, D&D and commercial strategy and policy. In the past few months, the focus has been on plutonium management (see separate article), spent fuel management and tank remediation & closure. Specific areas of interest and activity include;

Aging facilities management – developing technologies and management practices to ensure that current wet and dry fuel storage facilities (which can be 30-40 years old) are safe to store fuel for another 30-40 years or more pending implementation of a geological disposal facility.

Nonstandard fuels disposition – comparing disposition pathways of nonstandard (U.K. exotic) fuels to identify common issues, complementary approaches and technology gaps.

Remote welding of fuel canisters – exchanging information on recent trials completed in the UK on remote welding of canisters engineered from Duplex steels and the applicability of this approach in the US where stainless steels are currently the material of choice.

Sludge retrieval – exchanging information on lessons learned during sludge retrieval operations at K Basin at the DOE Hanford site and their applicability to sludge retrieval from the storage ponds at Sellafield in the UK.

In situ heel encapsulation – exchanging information on heel retrieval and dissolution activities and tank closure approaches adopted at Savannah River, Idaho and Hanford and their applicability to a specific series of tanks at Sellafield.

Fuel drying and dry storage facilities - seeking methods to improve the safe, secure, cost effective, and innovative methods of fuel drying and dry storage facilities by leveraging on past experience and technology development activities performed and planned in the U.S. and the U.K.

Over the next few months, these topics will be developed further and will be supplemented with new areas.

In addition, a Government-to-Government meeting on contracting approaches and experience is being planned for September 2012. The addition of DOE-Nuclear Energy to the SOI adds a whole new, untapped dimension to the scope of the agreement which will be addressed in the coming months.

Overall, the SOI is benefitting both the US DOE and the UK NDA. Success is manifesting itself in both tangible and intangible outputs such as in-kind input into R&D programs, as well as information sharing and lessons learned. The potential for additional activity is substantial and so as more and more people become aware of the benefits of this international collaboration it is highly likely that the number of topic areas being addressed will grow too.

International Collaboration: Development of Cryograb Technology for Waste Retrieval

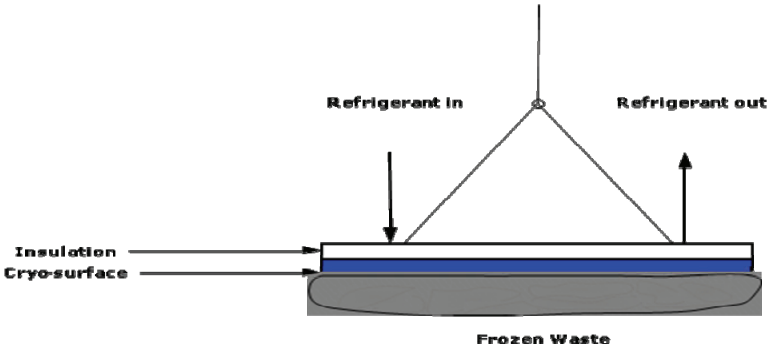
The National Nuclear Laboratory (NNL) in the UK and NuVision Engineering (NVE) and Savannah River National Laboratory (SRNL), both in the US, are collaborating on a 3-year program to develop, evaluate and demonstrate cryogenic grabbing technology for waste retrieval from underground storage tanks at the Savannah River Site.

The technology works by freezing water associated with the waste to form a solid mass that can be retrieved. The freezing is achieved through an engineered cooling surface, or "cryo-head" which is placed in contact with the waste. Cryo -head designs are tailored for the specific application and can include plates, fingers, or webs.

A range of options for cooling the cryohead exist and the favored one is selected based on the operational requirements: either cooling via electrical means, refrigerants (a variety of liquids and gases), or in some cases direct injection.

The technology has been implemented in the UK in nuclear and non-nuclear waste recovery and processing operations and is a very effective means of recovering sludge type wastes with minimal disturbance of the material.

In the first phase of the current USDOE-funded program, NNL is performing an evaluation of the feasibility of deploying 'cryograbs' for the recovery of heels of material that remain following bulk waste retrieval operations. NVE and SRNL have worked with NNL to clarify the deployment environment, establish design constraints and provide information on waste properties. NNL has used this information to perform thermal modeling of the rate of waste freezing given known variations in waste properties and a variety of freeze head designs. In subsequent work, the team will assess and develop deployment scenarios based on entry restrictions, tank internals, retrieval objectives, and the cryomodeling analysis and will then perform a downselect on the deployment scenarios and cryohead designs. The output of this current phase of the project will be an assessment of the feasibility of developing cryograb technology as a viable option for waste retrieval in the US. The next phases of the project will lead to the development of a cold pilot scale demonstration and will aim to take the technology to TRL-5.



Transferring Best Practice in Research and Development

One of the Nuclear Decommissioning Authority's (NDA), strategic objectives is to ensure that sufficient and appropriate R&D is being carried out to technically underpin delivery of the decommissioning and clean up mission whilst maintaining high standards in safety, security and environmental management. There is therefore a requirement to provide transparency and visibility of the technical baseline and the R&D requirements to provide confidence in the deliverability of the Site License Companies' (SLCs) plans as well as to provide overall visibility of R&D across the NDA Estate to ensure maximum return on investment and to avoid duplicative efforts.

To help meet these objectives, the NDA and the SLCs use a robust gated approach to their R&D efforts, apportion clear accountability for technical assurance, use a consistent system for assessing technology maturity using Technology Readiness Levels (TRLs) and ensure that the programs of R&D are directly linked to the overall NDA lifetime plan.

The SLCs generally produce Technical Baseline and Underpinning Research and Development (TBuRD) Requirements on an annual basis although updates are provided throughout the year as R&D is carried out so that latest information is always available to the NDA.

Recently, the TBuRD submissions and process have been independently reviewed, resulting in a number of observations and recommendations for improvements including recognition of the need for implementation of a standard procedure to identify and address inconsistencies in TBuRD submissions between the current TRL, the insertion point of the proposed solution and / or the projected cost and suggestions on how better to identify gaps in the R&D program and the need for a process to prioritize funding to ensure that the most pressing needs are met and that funding is directed at those areas where the maximum return on investment will be realized

The analysis is currently being shared with the US DOE to see if lessons can be learnt and R&D program synergies identified. The report itself is currently being summarised for public distribution and will be available later in 2012.

Collaboration in Plutonium Management Moves to the Next Level

Following the DOE – EM sponsored U.K/U.S. bilateral workshop on plutonium materials management in April 2011 great strides have been made towards jointly funded R&D programs between the parties. The workshop, focused on technical activities in plutonium materials packaging, long-term storage, surveillance and disposition strategies, was hosted by the Savannah River National Laboratory (SRNL) at the Savannah River Site. Participants included staff from DOE-HQ, DOE-SR, DOE-NNSA, U.K. NDA, U.K. National Nuclear Lab, Sellafield Ltd., LANL, Shaw-Areva MOX, SRNS –NMS and SRNL. The two and half day Workshop also included the tours of the Defense Waste Processing Facility and the Mixed Oxide Fuel Fabrication Facility, under construction, at the SRS.

The workshop discussions enabled both groups to develop a better understanding of the others' respective overall plutonium program strategies and highlighted the key differences in both countries' programs. The workshop also identified potential areas for collaborative research and technology development activities between DOE-EM and the UK NDA. These areas have been advanced through multiple group telephone calls during the past 12 months and culminated in a videoconference in March 2012 where NDA agreed to fund Phase II of a project on Stress Corrosion Cracking of storage canisters which has hitherto been funded by DOE. In this way, the cost of the overall effort is divided between the parties and the results can be shared. Other areas identified for funding include residue immobilization, corrosion in storage canisters and gaining a better understanding of gas generation in canisters. In addition, it was agreed to collaborate on a developing common strategy to creating a sustainable R&D capability in the field of plutonium for the future.

First Row: *Beth Hackney (SRNS); Jim Marra (DOE/EM); Rebecca Weston (UK/Sellafield); Gary DeLeon (DOE/EM); Hitesh Nigam (DOE/EM); Natraj Iyer (SRNL); Kerry Dunn (SRNL)*
Second Row: *Tom Monahon (SRNS); Kevin Leyland (UK/Sellafield); Chip McClard (SRNS); Steve Hensel (SRNL) Charlie Scales (UK/NNL); Paul Gilchrist (UK/NDA); Andrew Worrall (UK/NNL); Matt Hackney (SRNS); John Berg (LANL); Paul Cook (UK/Sellafield)*

Organizational Changes in NDA and DOE-EM

In the past few months, both NDA and DOE-EM have undergone some organizational changes. On the UK side, John Clarke was appointed CEO of NDA on March 2 2012 following the departure of Tony Fountain in December 2011. John has been a member of the NDA Board since 2008 and led the negotiations for the sale of Springfields Fuels Ltd to Westinghouse and managed the sale of surplus NDA land, both of which generated multi-million pound benefits to the UK taxpayer. He also played a leading role in restructuring the NDA during 2010 and 2011, working closely with then CEO Tony Fountain.

On the US side, DOE EM implemented a new organization in February 2012 comprising a set of new deputy assistant secretary positions responsible for various "mission units" and "mission support" areas. In addition, the reorganization establishes a new set of associate deputy assistant secretaries and eliminates some previously established offices. The new structure is designed to result in clear roles, responsibilities, authorities and accountabilities within the Field and within Headquarters to support the continuous improvement of the EM Program. More details of the revised structure of EM and the roles and responsibilities of each unit can be found at http://www.em.doe.gov/Pages/orgstructure.aspx

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