WM2014 Conference Panel Report

PANEL SESSION 113: Prospects for an International (Multi-Country) Repository Progress

Co-Chairs: **Enrique Biurrun**, *Germany*
Leif Eriksson, *USA*

Panel Reporter: Keith Miller, *National Nuclear Laboratory, UK*

Panelists:

1. **Hans Codee**, *COVRA, Netherlands*
2. **Charles McCrombie,** *Arius, Switzerland*
3. **John Mathieson,** *NDA, UK*
4. **Graham Fairhall,** *NNL, UK*
5. **Paul Degnan,** *IAEA, Austria*
6. **James Voss,** *Predicus LLC, USA*

This panel session focused on the prospects for development, construction and operation of a Multi-Country Repository. Enrique Biurrun introduced a group of International Experts to present their views on this important topic. The format of the panel is that all presenters will delivery their presentation, followed by an open discussion and questions from the floor. Question and Answer sessions followed and included questions on the criteria for selecting a site, and should this relate to the number of operating NPP?, would a potential host country be prepared to sell real-estate to the "Nuclear Community" in exchange for a one-off fee? Who is actually responsible for the "Post Closure" period?

Summary of Presentations

Paul Degnan began the session with a presentation on the IAEA's role in relation to the opportunities for a Multi-national repository. He started by giving an overview of global Nuclear power today and noted that even after the events at Fukushima (March 2011) the driver for nuclear power remain unchanged. In fact the Agency's yearly projections so a high case of a near doubling of installed NNPs by 2030. Paul then outlined some of the IAEA priorities for Radioactive Waste Management (RWM), giving some of the reasons why member States might consider Regional Cooperation, including the potential advantages of sharing resources and infrastructure. Underpinning these potential collaborations would be a common understanding of National responsibilities together with the status and expectations of the partners. There have been examples of countries sharing Nuclear Infrastructure, but with the exception of Sweden and Finland these have focused on the commissioning and operation of NNPs. **Paul** concluded his presentation by discussing the IAEA's position on Multi-national Repositories, with particular reference to the Joint Convention and the IAEA's published documents dating back to 1998. He concluded by stating that despite the recognized benefits, there had been no real progress in sharing repositories amongst established Member States and that this was due to the focus on Geological Disposal (GD) and the distant time schedule for GD, no time pressure for action now.

James Voss presented a study on the Macroeconomic Impacts of an International Repository, illustrating the impacts with an example of a repository in Argentina and Australia. Previous studies have established that both countries have superior geological attributes that would

equally support an International Repository. He then went onto outline the comprehensive range of Model Inputs that had been used, and their corresponding outputs in terms of Annual Operational Revenues, Direct Tax Payments, Direct and Supplemental Employment and other Macroeconomic impacts. **James Voss** concluded by comparing these impacts in terms of the overall economies in Argentina and Australia, noting that substantial benefits would be delivered in both.

Graham Fairhall outlined a different approach to this topic, and started his presentation by giving a brief overview of the UK's National Nuclear Laboratory (NNL). There are clearly a number of benefits for an International Repository, including: economies of scale, safety and security and options for siting. A range of criteria is also needed to support these objectives including international support and national political approval and stability, common waste treatment and storage approaches and stakeholder engagement. **Graham Fairhall** noted that much of what is required is already undertaken in the supply of nuclear fuel for international markets, and is accepted practice with strong political and public acceptance. Looking to the future, and the adoption of Generation IV technologies, these technologies could change the perspective as recycling of nuclear fuel will be required. This in turn could lead to the value of fissile material exceeding High Level Waste (HLW), trade in Plutonium and waste substitution. These factors alone will increase the likelihood for an International Repository.

John Mathieson gave an overview of the International Framework for Nuclear Energy Cooperation (IFNEC) in his role as Co-Chair of the Infrastructure Development Working Group (IDWG). IFNEC consists of 63 nations and 3 International Organisations and was known as the Global Nuclear Energy Partnership (GNEP) until 2010. IFNEC is working on the concept of Comprehensive Fuel Service (CFS) and supporting the work of IDWG (focusing on newcomer nations and infrastructure) is the Reliable Nuclear Fuel Services Working Group (RNFSWG) (focusing on fuel cycle implications). A number of discussions have already taken place in relation to CFS, where it is recognized that front-end services are routinely provided via the commercial market and that Back-end services are less well developed due to restrictions on recycling and HLW substitution. **John Mathie**son concluded that, effective regulatory and legal mechanism to support the expanded development of back-end fuel services will be essential. Governmental and public acceptance (at all levels) will be required to maintain existing programmes and those of the emerging nuclear nations.

Charles McCombie began his presentation with an overview of those European nations with either National Solutions, or the potential for a Regional Solution. Part of the justification for a Regional Solution, is based on the impracticality of each of the 28 Member States (MS) having their own Waste Management Organisation and the impossibility of having 28 separate Geological Disposal Facilities (GDF). **Charles McCombie** then outlined a potential organizational structure, leading to the establishment of the European Repository Organisation (ERO) around 2025. Much of the current activity is being driven by the EC Waste Directive, Articles 14 and 15, and the requirement to submit a formal report, as soon as possible, but not later than August 23, 2015. He then went on to describe the conditions for exporting radioactive waste out of a MS and also those governing shipment to a third Country. In 2011, the ERDO-WG submitted a report to Governments of MS, highlighting the economic drivers and the role and expectations for NPP and non NPP MS. **Charles McCombie** concluded that safe and secure management and disposal of radioactive waste is needed for all EU MS, however large or small.

Regional disposal facilities remain a legal possibility within the EU and that national tasks of allocating responsibilities for decisions relating to national project must come first.

Hans Codee concluded the formal presentations for Session 113, with a view to looking Off-Shore for a solution. **Hans Codee** struck a chord with the audience, with a quote from Mark Twain relating to new ideas and then proceeded to take a light-hearted, but effective look at the issues. There are currently 137 operating NNPs in the EU. Each MS has radioactive waste and all MSs need a waste management system. The EU Waste Directive (2011/70) requires all MS to quantify their Radioactive Waste (RW) and also their plans for dealing with this waste. However in the context of the very long timescales for dealing with RW, what does "National" actually mean? **Hans Codee** then illustrated this issue via a series of slides showing how the national boundaries in Europe have changed in the 2000 years since 1 AD. In this context and with a review of the economic, technology, timescales and siting conditions for National Programmes, **Hans Codee** proposed the construction of an artificial island in the North Sea off the coast of the Netherlands, in a similar manner to the Palm Island in Dubai and Kansai Island in Japan. Known as Tulip Island, accepting RW from all EU MS, independent of all National considerations and sponsored by the EU.

Questions and Answers

In response to a question on whether there should be specific criteria for selecting a host nation, and whether one criterion could be the number of operating NNP, **Charles McCombie** replied that a similar argument could be applied to countries that export Uranium. Similarly from a Safety and in country economic benefit, then Argentina would be selected. Hans Codee noted that this was a negative approach and that the topic should be discussed in a much more positive manner.

Not specifically a question, more of a comment from the floor, one approach could be for the international nuclear community to form a consortium, purchase real-estate in Australia and then as host to the repository, take a one time payment.

Hans Codee was asked if the Netherlands proposal to host a repository was for all countries? He replied that it was a dual track approach, with National and Multi-national waste input.

The Panel was asked to explain the relationship (overlap) between International Parties and National plans for repository operations. At present one stands in the way of the other "making it work". **John Mathieson** replied that the International Framework for Nuclear Energy Cooperation (IFNEC) organisation was brought together to discuss this very issue. **James Voss** noted that the European Union (EU) framework overcame some of these issues and was a very powerful way forward.

These question where then followed by an extensive discussion on waste issues, and particularly who has the actual responsibility for Post Closure period, would it be the relevant nation or organisation (EU). **Charles McCombie** noted that the liabilities would be shared between countries. **John Mathieson** stated that if a country responsible for building a facility e.g. Tulip Island no longer existed (referencing the presentation by Hans Codee) then the problem would be left behind. **Graham Fairhall** highlighted the potential of a Fast Reactor programme to trade

Plutonium and use to Waste Substitution. **John Mathieson** also noted that China and Taiwan where cooperating on SNF disposal.

Paul Degnan was asked if the IAEA had a role in producing a guidance paper for new and emerging nuclear nations in relation to repository siting. **Paul Degnan** responded by stating that the IAEA has no part in influencing policy, its role is to provide objective information.

Leif Eriksson closed the panel and thanked the members for their contributions. A recommendation to the PAC was made for a similar session to be held during WM2015.