

Three Sites featured at WM 2011

Three sites are highlighted at this year's Waste Management conference. Each afternoon—Monday through Wednesday—a focused session will feature one of the three sites. Reflecting the international nature of this conference a site outside the U.S. is the first featured site.

Monday afternoon the Sellafield site in northwest England is the focus of a special panel session. The session will review past accomplishments and challenges, and look toward the future of the site. Participants from US sites will join the discussion for the second portion of the sessions.

The diversity of the Sellafield site portfolio and the challenges that the teams face cannot be overestimated. Sellafield is the custodian of some of the UK most hazardous nuclear wastes and legacy facilities. However by applying modern techniques and treatments, along with the capability and knowledge of both Sellafield Ltd and Nuclear Management Partners, we are able to safely deliver some excellent work, demonstrating real progress and value to the UK taxpayer.

Under the ownership of Nuclear Management Partners, Sellafield Ltd is safely delivering nuclear decommissioning, waste management and commercial operations. With a diverse portfolio which stretches across the North West of England and spans the entire history of the UK's civil nuclear programme, our challenge is unique. The cleanup of the Sellafield site is one of the most important and demanding managerial, technical and environmental challenges for the UK

Sellafield is a United Kingdom (UK) government owned site under control of



the Nuclear Decommissioning Authority (NDA), who selected NMP to manage Sellafield Ltd's diverse mission of decommissioning, nuclear fuel manufacturing and spent nuclear fuel recycling, because of its world-leading expertise and track record in all of these functions.

NMP brings together the world's leading nuclear industry experts, URS, Amec and Areva, with its focus on making Sellafield safer, cleaner, more productive and a better neighbour.

Safer – establish and sustain world class safety culture.

Cleaner – maximise the reduction of risk to the public and the environment through accelerated high hazard reduction.

More productive – apply best in-class project management and workforce development from around the world to boost productivity and accelerate the achievement of milestones.

Better neighbour – minimise the impact of accelerated clean-up and

organisational change on our workers and host communities through planning, pursuit of new site activities and support of regeneration activities.

Today the highest priority for the site is accelerating high-hazard and risk reduction of the legacy facilities on what is the largest and most complex nuclear cleanup site in the world, with 170 major nuclear facilities and 2200 other buildings, housing activities that cover the entire nuclear fuel cycle. It is home to some of the most innovative and complex nuclear decommissioning projects in the world.

Sellafield was originally established in the 1940's as a Royal Ordnance factory, producing explosives for World War II. After the war the site was identified by the British government as the ideal location to develop a nuclear capability. By the early 1950's this development culminated in the world's first civil nuclear programme. Over the

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Monday Highlights

Panel and technical sessions following the opening plenary session Monday highlight US DOE Environmental Management, worldwide programs and progress, waste classification, and waste management policies and programs. The DOE Environmental Management Panel will begin at 10:00 a.m. Monday and will feature senior US DOE environmental managers.

Several international sessions, including a panel on progress in international deep geological disposal will also be held Monday morning. Other international sessions will discuss management and oversight, an international overview of decommissioning, and topics on packaging and design. These international sessions are a preview to Monday afternoon's panel session on the first featured site—Sellafield, located in northwest England.

Sessions on communication of technical issues, advances in nuclear safety, emerging issues in Low Level Waste, and the future of Yucca Mountain are also featured Monday afternoon. Check your program and find the session that fits your interest!

Attention Speakers and Co-Chairs!

Make sure you are registered for the conference, and take advantage of a chance to meet your colleagues.

All presenters and co-chairs are to check-in during registration to confirm attendance and receive any session update information.

Each morning, a speaker and co-chair breakfast is held at 7 a.m. on the third floor of the convention center. Each session has an assigned table. This is a chance to meet others in your session and finish any session organizing. Please be sure to attend.

Exhibit Hall Open Daily

There's action in the lower level of the convention center. That's where you'll find more than 200 exhibits representing the full spectrum of radioactive waste industry. The WM Exhibit and Marketplace has traditionally been a center for networking, viewing demonstrations and new products. Evening receptions are held here Sunday, Monday and Tuesday evenings. *Insights* newsletter staff will be walking the exhibit halls on the lookout for any special "Rad-Hot" deals. Look for our review right here in the *Insights*.

Around Phoenix

There's still time to explore the spirits of downtown Phoenix. Monday evening you can join friends for a 3-hour walking tour—with lots of breaks—of the history, haunts, and culture of downtown. You'll visit the haunted Ghost Bar in the San Carlos Hotel, explore the historic Orpheum Theater and the new CityScape area. The Phoenix Ambassadors will lead the exploration. If you haven't preregistered, check the registration desk to see if spots are still available.



Featured sites *continued from page 1*

next five decades facilities were constructed to manage the waste from the growing number of commercial reactors being built across the UK, including reprocessing facilities. These facilities were designed and built over very short timescales, to meet increasing demands and with limited thought to emptying and decommissioning.

As a consequence some of the greatest decommissioning challenges facing Sellafield currently include:

- Degraded legacy facilities with nuclear inventories dating back to the 1940's.
- Diverse and highly constrained decommissioning activities due to close proximity of nuclear facilities and radiological conditions.
- The need to upgrade and improve aged facilities prior to decommissioning to allow removal of radiological inventory.
- Lack of current plans, drawings, or records.
- Much of the work is unique and has not been done before.

The **Savannah River** site in Aiken, SC will be showcased Tuesday afternoon.

A site on 198,344 acres, or 310 square miles, near the Savannah River in South Carolina, with a workforce of 12,000 and an annual budget of \$2 billion, the Department of Energy's Savannah River Site (SRS) is an industrial complex responsible for environmental stewardship and cleanup, waste management and disposition of nuclear materials. With a long track record of being the safest site in the DOE complex and one of the safest major industrial sites in the world, SRS' highest goal is to protect the workers, the public, the environment and national security interests.

During the early 1950s, SRS began to produce materials used in nuclear weapons. Five reactors were built, along with support facilities including two chemical separations plants known as "canyons," a heavy water extraction plant, a nuclear fuel and target fabrication facility, a tritium extraction

facility and waste management facilities. Irradiated materials were chemically processed to separate useful products from waste. After refinement, nuclear materials were shipped to other DOE sites for final application. SRS produced about 36 metric tons of plutonium from 1953 to 1988 under the management of DuPont.

Today, SRS is dedicated to maintaining the highest possible safety and security standards while processing and storing nuclear materials in support of national defense and U.S. nuclear non-proliferation efforts and developing and deploying technologies to improve the environment and treat nuclear and hazardous wastes left from the Cold War. The contractors guiding the site toward these goals include Savannah River Nuclear Solutions (Site Management and Operations and Savannah River National Laboratory), Savannah River Remediation (Liquid Waste Operations), WSI Incorporated (security), Shaw AREVA MOX Services (Mixed Oxide [MOX] Fuel Fabrication Facility construction), Parsons (Salt Waste Processing Facility construction) and the University of Georgia (Savannah River Ecology Laboratory).

Finally, Wednesday afternoon will focus on the **West Valley Demonstration Project** in New York. The West Valley Demonstration Project is a unique operation with the DOE complex. Established through the West Valley Demonstration Project Act of 1980, the DOE is responsible for solidifying the high level waste, disposing of waste created by the solidification, and decommissioning the facilities used in the process. The land and facilities are on property of the New York State Energy Research and Development Authority and represents about 200 acres of the 3,300 acres Western New York Service Center. After DOE completes its responsibilities, the premises will be returned to New York State.

Each day, Insights will highlight the featured site with special articles about each site. Look for additional information on the Sellafield site in this issue.

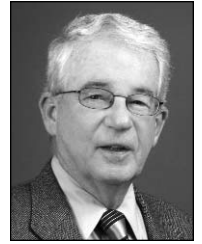
President's Welcome

On behalf of the Board of Directors, I would like to welcome you to WM 2011.

This year promises to be an exciting conference with over 100 sessions and workshops planned. The WM Symposia is a non-profit organization designed to further educational objectives. This year we have a sizable number of students, with over 50 attending and making presentations. We also plan to issue 8 scholarships through the Post Foundation. The scholarships will be presented at the Awards' luncheon on Tuesday. The Post Foundation Golf Tournament provides a large part of the funding for the scholarships and I want to thank those event sponsors and those of you who participated in the event.

This year we have a large international contingent and as a result, one of our featured sites is Sellafield in the northwest of England. We also are encouraging international cooperation in the regulatory area, as we are holding a workshop sponsored by the IAEA, the US NRC and the US DOE. The purpose of the workshop is to discuss common approaches, methods and tools used to demonstrate compliance with dose or risk criteria for LLW facilities.

Please take the time to visit the Exhibit Hall and meet with the diverse array of talent and equipment that is displayed. Enjoy the conference.



James Gallagher



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Europe's Largest Nuclear Project

Construction of Evaporator D, a new Highly Active (HA) Liquid Evaporator at Sellafield, is the largest nuclear project in Europe and will provide additional capacity to support the Sellafield site's existing evaporators, which play a pivotal role in the delivery of reprocessing, historic clean up and high hazard reduction across the Sellafield site.

What does an evaporator do?

The evaporator receives HA liquor from the evaporator stock tank by a batch process and is steam heated under vacuum using up to six coils in the evaporator and the evaporator jacket. During the evaporation process, steam is removed through the overhead condenser, whilst HA concentrate is removed from the evaporator via steam ejectors back to the highly active liquid effluent storage.

Challenges

The project has faced a number of challenges ranging from preparing a justification of the need for a new facility, and the development of a construction methodology to minimise risk to personnel and to existing buildings.

Solution

The strategy is for off-site fabrication of large scale modules which are then transported to site by sea and installed into the buildings concrete shell using a gantry system. This is the first time in the history of the Sellafield site that large-scale modular construction will be used.

Progress

Evaporator D Building

- Construction of the building foundations started May 2009 with final concrete pour of the raft foundation completed August 2009
- The project then moved to its main construction phase with the introduction of two self erecting tower cranes in November 2009. As the concrete shell has progressed, structural steelwork and cladding has started at the lower levels of the building
- Work on the essential services has started in earnest with the area being prepared for the first foundation, that of the cooling towers



- In parallel with civil construction, the mechanical, electrical and instrumentation work commenced in September 2010

Modules

- Work on fabrication of the main vessel, the evaporator, is ongoing at Bendalls Engineering, Carlisle
- In preparation for receipt of vessels and pipework, Interserve Industrial Services Ltd, have started (November 2010) assembly of the steelwork frames for modules at its facility in Ellesmere Port

Module Delivery Route

- Construction work for the temporary marine access development started August 2009 following receipt of the planning application from Copeland Borough Council. This work has included the placing of four 38 metre steel beams to form a bridge over the River Ehen.
- A series of barge landing and off-load trials were undertaken in December 2009. The trials were a successful demonstration of the

ability of the barge to land on the beach and off load modules.

- The project successfully completed trials of the transporters (Self Propelled Modular Transporter or SPMTs) in July 2010. This included testing the new road layout on the road to Station Gate

October 2010 saw the arrival of the first sections of the Gantry System to Sellafield. The Kursk Beams, each 38 metres long, were original fabricated to aid in the raising of the stricken Kursk submarine.

What's happening this year?

- Main Evaporator D building 'reaches' the required height to install the Gantry System
- Installation of the Gantry (used to lift the completed modules into the Evaporator D facility)
- First barge delivery of modules to Sellafield
- Installation of first module into Evaporator D facility
- Further modules will be delivered and installed throughout 2011

Plenary Session Kicks Off 2011 Waste Management

This year's opening plenary session will feature a discussion of worldwide waste management issues. Dr. Ines Triay, well known to Waste Management attendees, will be joined by Francois-Michel Gonnot and Thomas Zarges to start the week-long conference. Dr. Triay is DOE Assistant Secretary for Environmental Management for DOE. Mr. Gonnot, chairman of the governing board of ANDRA, is a member of the Economic Affairs Commission of the French National Assembly. Mr. Zarges, president of URS Corporation and Construction, has responsibilities for operations worldwide. The experience and perspective of these keynote speakers, will set the global tone for this year's conference.

Student Opportunities at Waste Management

Monday is a day that will highlight students, and opportunities for them to network and meet other Waste Management professionals.

This year, there are more students from more places than ever before—including students from outside the U.S. A special networking session for students and young professionals will begin just after the International Welcome Reception Monday evening.

Student posters will be featured from 1:30-5 p.m. on Monday.



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Progress on Deep Geological Disposal in other Counties

By John Mathieson

Last year I did a round-up of what's happening with respect to the deep geological disposal programmes in a number of countries. I compared the setback in the US programme at Yucca Mountain against those that other countries had gone through, noting, with a degree of optimism, that most had readjusted their siting processes resulting in some progress. This article provides an update on that progress over the course of the last year.

The interim deliberations of the Blue Ribbon Commission are keenly awaited and it will be interesting to note what account they have taken of experiences in other countries. In particular the Disposal Sub-Committee visited Finland and Sweden and met with local community representatives as well as the implementing organisations Posiva and SKB respectively.

During the course of WM2011 we will have updates from several countries. In the Plenary Session M François-Michel Gonnot, the President of the French National waste management organisation Andra will give us details on progress with investigating the potential repository site for higher activity wastes at Bure in northwest France. And no doubt Dr Inés Triay will give us DOE's perspective on the situation with respect to the BRC.

Both Dr Triay and M Gonnot will be joined by Borries Raapke, the MD of DBE Technology, the German

repository construction organisation as well as senior representatives from SKB and Posiva. They will be discussing deep geological disposal issues in the Monday morning international panel following the Plenary. Throughout the conference we will also be getting national updates from Italy, the UK, Russia and other countries.

Taking a look around the world, not too much has changed since last year and it is good to report steady progress – or at least no programme has terminated. Sweden selected its preferred deep site for spent fuel near Forsmark in 2009 and in March this year will submit an application for the construction licence. Posiva continue to construct their facility at Olkiluoto which is now at a depth of more than 434m and anticipate having a repository operational by 2020, around the same time as neighbouring Sweden. In France, investigation at Bure have moved apace and are now entering a new “industrial” phase (as opposed to research) – a deliberate change of terminology to better reflect the mission; by law, the repository will be available by 2025 (subject to licensing, of course).

In the UK, no further communities have expressed an interest in hosting a facility. This means that at this time, only the Cumbrian communities are involved. As part of the UK process, the British Geological Survey published the locations in the region which are unsuitable to host a repository. After a 10-year moratorium

investigations at the German repository for heat-generating waste at Gorleben have restarted. After many legal challenges the Konrad repository for non-heat generating is targeted to become operational by 2013, following refurbishment. In Belgium, ONDRAF/NIRAS is researching HLW disposal in clay at its Mol underground rock laboratory and is awaiting a government decision on taking the siting process forward.

Switzerland re-established a siting process for both HLW and ILW under a new law in 2008; a decision on proposed sites will take place later this year. The siting programmes in Czech Republic and Hungary are still on hold.

Canada is developing a deep repository for L/ILW at Kincardine but will not start its spent fuel repository siting until the process has been agreed. In China they are investigating a potential site in the Gobi Desert to cater for the long-lived waste from its expanding nuclear programme.

Japan's volunteer siting process has not been very successful – after 10 years and several false hopes, they have still to find a site.

This is only a summary of what is going on around the world. It is important to note that the disposal community keeps in touch with each others' programmes. We are all keenly aware that setbacks in one country can have a knock-on effect in others – so hence the interest in the output from Blue Ribbon Commission.

AL LETCHER
President

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SITE NEWS

Improved Access to Hanford Single Shell Tank Will Speed Radioactive Waste Removal

55-Inch Hole Safely Cut into the Dome of Tank C-107 over the Weekend

Richland - - Installation of the Mobile Arm Retrieval System (MARS) into Hanford single-shell tank C-107 took another step forward in December when Tank Farms contractor Washington River Protection Solutions (WRPS) and its subcontractors safely cut a 55-inch diameter hole in the top of the tank. The hole was cut through 15 inches of concrete and steel rebar in order to place a new riser for the MARS unit that will be used to remove approximately 247,000 gallons of radioactive and chemical waste.

WRPS is a prime contractor to the Department of Energy's (DOE) Office of River Protection (ORP) and is charged with eliminating the risk to the environment posed by 53,000,000 gallons of radioactive and chemical waste stored in Hanford's 177 underground tanks.

"We spent more than a year planning and preparing for this project to ensure that it would be done safely, while protecting the environment and limiting the exposure to our workers. All of our hard work paid off with the successful completion of this project," said Kent Smith, WRPS Deputy Manager of Retrieval and Closure Operations.

The 55-inch diameter hole is the largest ever cut into an active DOE radioactive waste storage tank and it creates the access for the largest robotic arm developed to date for removing radioactive and chemical wastes from the tanks. "We have developed robotic arms at Hanford for many years but arms that would fit into the tanks through available risers were too small to do the job. The robotic arms that were robust enough to do the job wouldn't fit into the tanks. The only option to increase retrieval efficiency was to cut a larger access into the tank," said Chris Kemp, Deputy Federal Project Director for ORP.

To cut the hole, WRPS used a conventional technology that employs high-pressure water with a fine grit of garnet to cut evenly and precisely through the concrete and rebar of the tank's dome. The water flowed through the cutting equipment at a rate of approximately three gallons per minute at a pressure of 48,000 psi, cutting 8 inches per hour. Despite



winter weather conditions and freezing temperatures, the cut into C-107 took just under 24-hours to complete with no incidents.

"Even though this technology is commonly used in industry it has never been used in quite this way. We brought in AK Services of Boston, a specialty subcontractor that is used to working in hazardous environments, trained their personnel to our safety standards and provided the support they needed to do the work," said WRPS C-107 Project Manager Thom Myer.

Months prior to performing the cut, three different types of abrasive were tested, along with different cutting mechanisms. A mixture of water and garnet proved to be the most efficient and posed the least risk to workers, the environment, and the tank itself during the cutting operation.

During the cut, air samplers were set up inside the containment tent that surrounded the project and a ventilation system was in constant operation to draw air back into the tank and reduce the potential for contamination to escape.

"I was pleased to observe this work over the weekend. It shows again that challenging work can be done safely at

tank farms, and this is another step forward to getting waste out of the single-shell tanks. The progress on installation and use of the MARS equipment is encouraging and will be another tool in the waste retrieval toolbox," said Nancy Uziemblo Washington State Department of Ecology, Nuclear Waste Program, Tank Farm Oversight and Technology Development

Prior to the start of the cut, the portion of the tank dome to be removed was bolted to a crane to prevent it from falling into the tank when the cut was complete. Once it was cut free, the plug was lifted out of its hole and immediately wrapped in a plastic sleeve to prevent any potential spread of contamination. The plug was then placed in an isolated area where it will be staged for final disposal on the Hanford Site.

Once the plug of concrete and rebar were removed a large riser was carefully set into the hole. The riser has a shield plug bolted to its opening as well as thick gasket material around the outside to seal the hole. Delivery and installation of the MARS retrieval unit is scheduled for late February 2011.

Retrieval of waste from C-107 is planned to begin next summer.