

# DECONTAMINATION DECOMMISSIONING AND REUTILIZATION DIVISION

FALL 2007

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## DISCLAIMER

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## CONTRIBUTIONS

If you would like to contribute news or an article to the DDR newsletter, please contact Mr. Steve Horvath, the DDR Newsletter Editor, at (865) 481-6312 or via e-mail at: [shorvath@energysolutions.com](mailto:shorvath@energysolutions.com). If you have any recommendations regarding any aspect of the newsletter, these are welcome as well.

## THE CHAIR'S MINUTE FOR THE FALL 2007 NEWSLETTER

The fall of 2007 has a new event taking place, applications for new nuclear power plants. This change after so many years of plant cancellations and early decommissioning has brought a different focus to the nuclear industry. I spent many years in reactor operations but recognize just how significant the DD&R mission is to the survival of the uses of nuclear science. The public surveys all focus on the negatives of the failure to complete decommissionings by the removal of spent fuel and other "materials" from sites. The media focus on heritage sites always has a hint of negativism that 1940s activities are still not cleaned up.

It is imperative that our division, which has had declines in membership due to the completion of site shutdowns and budget constraints in federal projects, turn to a new stronger image. First I want to thank my predecessor Larry Boing for his dedication to keeping DD&R vital during his year as Chair. Then I want to challenge each of you to think differently. It is obvious to many of us that with license extensions and new designs, the life of a new plant will approach perpetual. We need, as a group, to provide lessons learned from cleanups to those new designs. We also need to be part of reutilization as we approach a generation of operating plants, which will require the upgrade or replacement of every major component including reactor vessels. With closure of the low level waste sites and the delay in Yucca Mountain and Private Fuel Storage startups, it is necessary for each of us to have clear and concise messages to the public, which is expressing increasing concern.

Our division needs to emphasize its role in revitalization and reuse of existing sites. Also our absolute dedication to the removal of all used nuclear components and materials from the 72 plant sites in America. The hearings for the PFS interim storage site gave me a personal opportunity to study the national Environmental Policy Act and understand the public rejection of perceived abandonment or dumping while new sites are started. I urge each of you to carry our message of the need for this division's functions into every discussion on the enlargement and advancement of the nuclear role in America. From hospitals to national labs to power plants neighbors get concerned when they hear of a lack of solutions. It is our job in DD&R to provide and promote acceptable cleanup polices and honest answers to their questions.

JOHN PARKYN  
DD&R Division Chair 2007-2008

## 2007 DDR TOPICAL MEETING SUMMARY AND HIGHLIGHTS (Jim Byrne; jbyrne4424@comcast.net)

The DD&R 2007 Topical Meeting "Capturing Decommissioning Lessons Learned" was held September 16-19, 2007 in Chattanooga, Tennessee. The meeting was a success with over 200 attendees from 12 countries and 26 exhibitors. The Opening Plenary session on Monday morning featured talks by Wayne Norton, President of Yankee Atomic, Sandra Waisley, Director of D&D and Facility Engineering for the Department of Energy's Office of Environmental Management (EM); Hans Riotte, Head, Radiation Protection and Waste Management, OECD Nuclear Energy Agency; and Thomas LaGuardia, the managing member of Laguardia & Associates. They provided an overview of decommissioning related issues addressing commercial, governmental and international lessons learned.

The DD&R Division presented two awards. DD&R Lifetime Achievement Award and the Award of Excellence. The Lifetime Achievement Award was presented to Mr. Tom LaGuardia for his lifetime contribution and leadership in the decommissioning area. Mr. Wayne Norton was awarded the Award of Excellence for the Connecticut Yankee Decommissioning Project.



Tom LaGuardia, Managing Member,  
LaGuardia & Associates, receiving DD&R  
Lifetime Achievement Award



Gerry Noordennen, Connecticut Yankee,  
receiving DD&R Award of Excellence  
for Wayne Norton, President & CEO

One of the main points of interest in the plenary and throughout the conference is the proliferation of decommissioning lessons learned websites. The following are some examples:

OECD's: <http://www.nea.fr/html/jointproj/decom.html>

DOE's: [www.hanford.gov/rl?page=974&parent=973](http://www.hanford.gov/rl?page=974&parent=973) & [www.efcog.org/bp/index.htm](http://www.efcog.org/bp/index.htm)

NRC's: <http://www.nrc.gov/about-nrc/regulatory/decommissioning/lessons-learned.html>

IAEA's: <http://goto.iaea.org/decommissioning>

Over the next two days all aspects of decommissioning were covered in 14 separate sessions oral presentations, and a Monday evening poster session.

The meeting ended Wednesday afternoon with a final plenary featuring an equally distinguished panel including William Manion, President, WJM Consulting; Sandra Waisley, Director of D&D and Facility Engineering for the Department of Energy's Office of Environmental Management (EM), Borislava Batandjieva, IAEA Division on Radiation, Transport and Waste Safety International Atomic Energy Agency. Gerry Van Noordennen, Principal, Dutchman Consulting; and Rex Norton, Communications Director for the Fernald Project.

## D&D PROGRAMMATIC AND PROJECT-SPECIFIC DECOMMISSIONING UPDATES

### PROGRAMMATIC

#### International Atomic Energy Agency (IAEA)

Contributed by: B. Batandjieva (B.Batandjieva@iaea.org) and M. Laraia (M.Laraia@iaea.org)

#### Trends and Priorities in Decommissioning of Nuclear Facilities and Their Impact On The IAEA Programme

The following are reflections on the current state and trends in decommissioning of nuclear installations, including the major components that determine evolution: state-of-the-art technologies and R&D (the industrial sector, research centers), economics (taxpayers and other involved parties), organization and management, public acceptability aspects, and innovative facilities. Safety-related aspects are not specifically addressed.

Such reflections are by no means intended to orient work in a pre-determined direction, but rather to offer ideas and provide the framework for further elaboration. The IAEA programme in the medium to long term should be based on likely trends - as they appear today- and the needs of Member States (MS) - particularly the developing ones.

#### State-of-Art Technologies and R&D

Q. The first question to answer is whether decommissioning is a mature set of technologies or not. In other words, is a significant improvement in D&D technologies still to be sought and is it desirable? I am not referring here to case-by-case adaptations of existing technologies which is anyway mandatory in almost all cases, but to development of new technologies. The latter, in my opinion would be only justifiable if it is felt that there are ample margins to reduce costs, wastes, and occupational exposures, or improve efficiency. If such margins are not so ample, expensive R&D programmes would not be justified.

Looking at the question from another view point, how is today's D&D technology adequate to the needs of developing countries? Should these countries develop their own technologies or rely on the market products which are manufactured by developed countries? Should the IAEA continue to disseminate information on all sorts of D&D technologies or be more selective? Should we provide guidance on how to adapt existing technologies?

More questions are related to the role of research activities. Is it expected that each country embarks on qualifying its own products for its own needs? Should decommissioning of any research reactor include some measure of R&D exercise (e.g. the BR-3 reactor, Belgium) or be conducted as a routine industrial activity? What role may exchange of information and know-how have in today's D&D world?

A. It is assumed that decommissioning is a quasi-mature industry in industrialized countries. What remains for the IAEA is to provide information and guidance on decommissioning of selected structures, systems and components presenting special problems, including material management. The second development area is to promote the use of decommissioning as a "package", in terms of optimized, holistic approach to the project, rather than sector-by-sector.

A. The picture in developing countries is not so clear. "Digesting" technologies imported from industrialized countries remains a painful process. The IAEA is bound to provide guidance in the relevant topical areas taking into account the specific economic and governance situation of countries with limited resources. Figure 1 gives a detail of the cementation plant successfully procured by the IAEA to Latvia in support of the Salaspils reactor decommissioning project.



Figure 1: The Salaspils Cementation Plant for Waste Solidification in Latvia

## Economics

Q. The actual costs of decommissioning are still quite uncertain. A good deal of work in this field has been carried out and the reasons for discrepancies investigated. Related to these aspects, uncertainties still exist on how large funds should be collected and kept aside to finance eventual decommissioning. Is this an area where the IAEA should perform more work? One of the problems we view now is that some developing Member States have trouble to collect decommissioning funds - particularly because this mechanism has not been in place during a plant's operational lifetime. In addition, decommissioning costs seem to pose excessive burden on the finances of some developing MSs, which calls for cost reduction.

A. In the light of recent experience and feedback from MSs, it is essential to increase MS awareness on the need to develop timely/cost-effective decommissioning strategies and planning. This will be normally achieved through assistance in capacity building.

## Organization and Management

Q. The key to a successful project is the organization. One option is to utilize the existing plant operations team both to manage, and to a certain degree carry out the decommissioning. This has the advantage that the human resource is already there, and is familiar with the plant. The disadvantage is that the operations staff have no decommissioning experience and may retain an "operations" mentality towards discharging the work.

Trend-wise, there is enough evidence to suggest that cooperation between the operating organization (with its' site and regulatory experience and vested interest in discharging the liability) and Decommissioning Contractors with clear prior experience of organizing and discharging decommissioning projects is the most effective combination. In any case, it is vital that the licensee retains sufficient plant personnel to understand, own and use the plant safety case, and to act as "intelligent customers" for work by contractors. Vice versa, one acute issue in countries with limited resources and small nuclear programmes is simply that there are no alternatives to using the operational staff for decommissioning purposes and there is no accessible contractors' market.

A difficult case is the management of the decommissioning of multi-facility sites. It may be inadequate or inappropriate if based on approaches and strategies developed for sites consisting of only a single facility. The varied nature of activities undertaken, their interfaces and their interdependencies are likely to complicate the management of decommissioning. These issues can be exacerbated where some facilities are entering the decommissioning phase while others are still operational or even new facilities are being built. Multi-facility sites are not uncommon worldwide but perhaps insufficient attention has been paid to optimizing the overall site decommissioning in the context of the entire life cycle of facilities.

One remaining issue is how to reconcile legitimate desires of the staff (job continuity, professional development, quality of life) with the challenges posed by a new activity- decommissioning. Person-by-person management is a necessary pre-requisite.

A. It is felt that the availability of technologies may not be the major factor limiting decommissioning achievements, rather the lack of organizational and managerial culture, including financial planning. Therefore, it will be essential for the IAEA to upgrade MS skills in organizational and managerial aspects of decommissioning –in particular, when domestic conditions prevent the use of contractors.

## Public Acceptability

Q. This aspect is often disregarded in decommissioning planning. In fact, it is often decisive in determining the decommissioning strategy. As one example, it will be enough to mention that in Russia and other parts of the former Soviet Union there are cities with tens of thousand inhabitants economically depending on operation of a nuclear power station. For them, one or another decommissioning strategy is not immaterial. Even in Western countries, the public is more and more attentive to land use, and this will influence decommissioning strategies.

A. It is important for the IAEA to highlight the benefits and lack of serious hazards from decommissioning. It is also important to elaborate on possible ways to mitigate social impacts. Decommissioning should also be viewed as an asset (release of a profitable site for other purposes) rather than just a liability. This may include inter alia provisions of guidance and ad-hoc resources for communication with the public and other stakeholders. Moreover, for the Secretariat is vital to actively support MSs in running decommissioning projects from cradle (preliminary planning) to grave (site release and project completion) and beyond (site re-development). Fig. 2 shows a small-scale Instance of post-decommissioning site reuse.



Figure 2: Montecuccolino University Centre (near Bologna, Italy); from research reactor (RB-2) to mechanical workshop

## Innovative Reactors and Other Technologies

Q. It is likely that the next few years will see the development of new nuclear technologies, and the testing and commissioning of prototype facilities. It is important that these developments take into account concepts and criteria to facilitate future decommissioning.

A. To review/upgrade existing design and operational features aimed at facilitating decommissioning or develop new concepts; and develop generic decommissioning plans for facilities from innovative nuclear technologies (Gen IV, INPRO, Fusion).

### Conclusions

With an increasing number of radioactive facilities and reactors now reaching the end of their useful life and being taken out of service, there is a growing emphasis worldwide on the safe and efficient decommissioning of such plants. There is a wealth of experience already gained in decommissioning projects for all kinds of nuclear facilities. It is now possible to compare and discuss progress and accomplishments worldwide. In a medium to long-term perspective, it is important to monitor lessons learned; in this way, the return of experience is felt to effectively contribute to progress.

## U.S. COMMERCIAL NUCLEAR UTILITIES

### Fermi 1 – Contributed by: L. Goodman (Goodman@dteenergy.com)

#### Fermi 1 Decommissioning Update

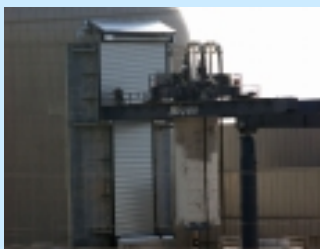
The main activity in progress at Fermi 1 this summer and fall has been dismantling the reactor rotating plug. The rotating plug is the top approximately 10 feet of the reactor vessel. During refueling, it had rotated to allow the handling mechanism to reach locations in the reactor for fuel and blanket assembly removal and insertion. The rotating plug is made of steel plates and 7 layers of steel encased graphite blocks separated by 2" thick steel plates. Each layer has approximately 500 graphite blocks plus thousands of metal chinkers (spacers ranging from pencil size to ~300 lbs installed to fill any gaps between blocks and around penetrations). The Fermi 1 reactor vessel is irregularly shaped, with the rotating plug portion being about 10 feet in diameter.

The work is like disassembling a 3D puzzle, piece by piece, with each graphite block being about 9" tall and 2 ½" square. The disassembly is being done manually, with personnel entering the top of the reactor, since the blocks are so closely fit together. The bottom layer was submersed in sodium during plant operation, so the blocks and chinkers were found welded together with solidified sodium. Sodium must be removed prior to disposal, so the chinkers and block surfaces are being cleaned of sodium residues. This is difficult, slow and painstaking work, especially since the sodium reacts with moisture in the air to form caustic. Shield plates have been installed in the plug penetrations, since the reactor internals remain in the reactor underneath the rotating plug. As the graphite blocks and metal plates were removed, 7 layers of shielding were being removed. At the end of September, less than 100 blocks remained to be removed from the bottom layer. Other work performed during the past few months included processing sodium residues from previously removed piping and components, and working on setup of the reactor and two of the primary loops for sodium processing next year. We also have been shaving slightly contaminated lead and deconning lead containing components to allow for recycling.

### LaCrosse – Contributed by: R. Christians (rec@dairynet.com)

The following picture portfolio highlights key activities for the removal, packaging, transportation, and disposal of the Reactor Pressure Vessel from Dairyland Power Cooperative's LaCrosse Boiling Water Reactor. This project was completed in the Summer of 2007.

Since that time, Dairyland has since removed some forced circulation piping in preparation for its Dry Cask Storage Project. The company has issued a Request for Proposal (RFP) to the cask vendors and will soon be evaluating the proposals. Dairyland is also evaluating the best site for an on-site Independent Spent Fuel Storage Installation (ISFSI) location.



Removal of Reactor Pressure Vessel



RPV Lowered in Transportation Canister



Downblending of Reactor Pressure Vessel



Placement of Upper Half of Transportation Canister

Big Rock Point (Special Highlight – Summary and Photo Portfolio of Site Historical Marker/Event)  
Contributed by: T. Petrosky (tdpetrosky@cmsenergy.com)

STATE HISTORICAL MARKER INSTALLED HONORING BIG ROCK POINT NUCLEAR PLANT  
AND LITTLE TRAVERSE BAY BANDS OF ODAWA INDIANS

CHARLEVOIX, Mich., August 28, 2007 – Consumers Energy, Little Traverse Bay Bands of Odawa Indians and Michigan Historical Commission officials recently unveiled a State Historical Marker at G. Robert Adams Roadside Park east of Charlevoix. The marker honors the achievements of the Big Rock Point nuclear plant and the significance of the area to the Odawas.

“Big Rock Point and its employees were pioneers in demonstrating that nuclear energy could safely and efficiently generate electricity,” said Jackson L. Hanson, Consumers Energy’s vice president of generation, engineering and services. “The outstanding safety record and the research that was conducted at the plant help set the standard for the commercial nuclear power industry that was to follow.”

The plant set several industry records throughout its operating life from 1962 to 1997 and was named a Nuclear Historic Landmark for its contributions to the nuclear and medical communities. The site was decommissioned and its 435 acres have been returned to a natural state, free for unrestricted use.

“This location amongst many others on Little Traverse Bay is part of the tapestry of historical and cultural significance for our tribal people,” said Frank Ettawageshik, tribal chairman of the Little Traverse Bay Bands of Odawa Indians. “The marking of our tribal sense of place enhances the appreciation of this region for tribal citizens and local residents, and visitors as well.”

“The Michigan Historical Marker program educates the public about the richness of Michigan’s past. This marker, which brings together the traditions and history of the Odawa people, with the late twentieth century activities at the Big Rock Nuclear Power Plant, is unique,” said Laura Ashlee, who coordinates the Michigan Historical Marker Program.

Also participating in the dedication ceremonies were Dave Miles from the Charlevoix Historical Society, Ethyl Knepp, Hayes Township Supervisor, State Sen. Jason Allen and State Rep. Kevin Elsenheimer. Miles noted that Big Rock Point nuclear plant brought national and international recognition to the small city of Charlevoix and that more than 2,500 people toured the Historical Society’s plant exhibit last year. Sen. Allen and Rep. Elsenheimer presented company representatives with a special tribute honoring plant achievements and the significance of the site to the Odawas.

The Historical Marker is located in the Adams Roadside Park on Lake Michigan, four miles east of Charlevoix. Visitors to the park can glance a short distance across the bay and view the former location of the nuclear plant and “Kitcheossening,” the big rock after which the plant was named.

In addition to the State of Michigan Historical Marker, former Big Rock Point employees Pam Gibson and Tracy Goble unveiled a landmark during the Aug. 25 event dedicated specifically to the achievements of the nuclear plant and its employees. The landmark is located near the entrance to the former nuclear plant access road and commemorates the realization of the dream that nuclear energy could safely and reliably produce electricity, and the fulfillment of the company’s promise to return the site to a natural state.

The landmark incorporates pieces of the plant’s containment steel and was designed to blend into the pristine northern Michigan environment. It was funded entirely by donations from employees and business friends of the plant.

On Jan. 8, 2007 Consumers Energy received approval from the U.S. Nuclear Energy Commission to release for unrestricted use 435 acres of the Big Rock Point Nuclear Plant property.



State of Michigan Historical Marker. The marker honors the achievements of the Big Rock Point nuclear plant and the significance of the area to the Odawas.



State Representative Kevin Elsenheimer (right) and State Senator Jason Allen (second from right) presented a special tribute honoring Big Rock Point to Consumer Energy’s Tim Petrosky (far left) and Jack Hanson.



Big Rock Point Special Landmark

Consumers Energy, the principal subsidiary of CMS Energy Corporation (NYSE: CMS), provides natural gas and electricity to more than 6.5 million of Michigan's 10 million residents in all 68 Lower Peninsula counties.

The Little Traverse Bay Bands of Odawa Indians has over 4,000 tribal citizens and provides governmental services from its offices in Harbor Springs.

For more information about Consumers Energy visit [www.consumersenergy.com](http://www.consumersenergy.com) or call Tim Petrosky at 231-547-8177. Electronic photos of the dedication are available by contacting Tim Petrosky.

For more information about the Little Traverse Bay Bands of Odawa Indians please visit [www.ltbbodawa-nsn.gov](http://www.ltbbodawa-nsn.gov) or call 231-242-1401.

The complete text of the State Historical Marker follows:

#### BIG ROCK POINT NUCLEAR POWER PLANT

Consumers Power Company (later Consumers Energy) opened the Big Rock Point Nuclear Power Plant just west of here in 1962. It was the world's first high-power density boiling water reactor, and the fifth commercial nuclear power plant in the U.S. The plant began as a research and development facility, with the first goal being to prove that nuclear power was economical. In addition to generating electricity, the reactor produced cobalt 60 that was used to treat an estimated 400,000 cancer patients. In 1991 the American Nuclear Society named the plant a Nuclear Historic Landmark. When it closed in 1997, Big Rock was the longest running nuclear plant in the U.S. Consumers Energy later restored the site to a natural area.

#### BIG ROCK POINT

Big Rock Point is named for a large boulder used as a landmark by Native Americans. At least as early as the mid-nineteenth century Odawa (Ottawa) Indians used Big Rock, which they called Kitcheossening, as a gathering place each spring. The Odawa summered at Waganaksing (the area between Harbor Springs and Cross Village), but dispersed into smaller groups and traveled during the winter. Each spring they returned to Big Rock, their canoes loaded with sugar, furs, deer skins, prepared venison, bear's oil, and bear meat prepared in oil, deer tallow, and sometimes a lot of honey. From there they returned to Waganaksing by crossing the bay in wiigwaas jiimaan (birch bark canoes). In 1999 elders and youth from The Little Traverse Bay Band of Odawa Indians recreated the crossing.

## DEPARTMENT OF ENERGY (DOE)

### Hanford Site – Contributed by: M. Gerber (Michele\_S\_Gerber@RL.gov)

Hanford Decommissioning Update: September 2007  
Michele Gerber, Fluor Hanford

#### Triple Victories at Hanford's K Basins

Fluor Hanford's K Basins Closure (KBC) Project tallied three major accomplishments at the U.S. Department of Energy's (DOE's) Hanford Site in southeastern Washington State this past summer. The Project finished emptying the aging K East Basin of both sludge and the last pieces of scrap spent nuclear fuel. It also completed vacuuming the bulk of the sludge in the K West Basin into underwater containers. The 54-year-old concrete basins once held more than four million pounds of spent nuclear fuel and sit less than 400 yards from the Columbia River. Each basin holds more than a million gallons of radioactive water.

In 2004, Fluor finished removing all the spent nuclear fuel from the K Basins. Nearly 50 cubic meters of sludge remained -- a combination of dirt, sand, small pieces of corroded uranium fuel and fuel cladding, corrosion products from racks and canisters, ion-exchange resin beads, polychlorinated biphenyls, and fission products that had formed during the decades that the spent nuclear fuel was stored underwater.



Capturing the sludge into underwater containers in the K East Basin took more than two years, and vacuuming the much smaller volume of sludge into containers in the K West Basin required seven months. Workers stood on grating above the basin water and vacuumed the sludge through long, heavy hoses. The work was complicated by murky water and contaminated solid waste (debris). Pumping was paused several times to safely remove and package debris that totaled more than 370 tons.

In October 2006, Fluor Hanford workers began pumping the sludge captured in the K East Basin containers out through a specially designed pipeline to underwater containers in the K West Basin, about a half mile away. They used a heavy but flexible, double-walled “hose-in-hose” system. Pumping work progressed slowly at first, but ramped up in spring 2007 and was completed on May 31.

Just a week before sludge transfers finished, the KBC Project removed the last few small pieces of irradiated fuel (about 19 pounds) found as the last remnants of sludge were vacuumed up. The fuel was loaded into a cask that sat underwater. The cask was hoisted out of the water, decontaminated, and transported to the K West Basin, where it is now being stored underwater until it can be dried and taken to storage in central Hanford. Removing the sludge and fuel from the K East Basin eliminated the final major radioactive sources there, and made the Columbia River and the adjacent environment safer for everyone who lives downstream.

Fluor’s priority at the K East Basin quickly turned to final preparations for demolishing the structure. Final activities to sort debris are progressing, along with plans to de-water the basin and turn it to rubble in the next two years. At the K West Basin, after the bulk sludge was removed July 3, workers began preparing to load out the last of the “found” nuclear fuel and to complete final pass sludge collection this coming year.

#### 241-Z Plutonium Liquid Waste Treatment Facility Demolished

Fluor’s Central Plateau Deactivation and Decommissioning (CP D&D) Project, along with workers from the Plutonium Finishing Plant (PFP) Closure Project achieved another major success in June when they finished demolishing the 241-Z Liquid Waste Treatment Facility at PFP. They also completed removing rubble and stabilizing the site, declaring victory on June 1. Demolishing the facility met a milestone in the Tri-Party Agreement (TPA), Hanford’s cleanup pact, four years and four months early! In addition Fluor demolished two small structures ancillary to the 241-Z Facility.

Demolishing the sheet-metal 241-Z facility, removing rubble and stabilizing the site took exactly six weeks from start to finish. The task generated about 480 cubic yards of low-level debris. The concrete slab floor of the facility was sealed, covered with a robust polyurea membrane, and then overlaid with two-to-three inches of gravel.

Fluor began planning for cleaning out the 241-Z Facility five years ago, and started physical remediation work on five highly contaminated vaults and tanks under the facility in late 2005. The 241-Z Facility was part of the original PFP construction during 1947-49; however the above-ground portion of the building was erected in the early 1980s.

Current milestones in Hanford’s Tri-Party Agreement call for the PFP complex to be razed to “clean slab-on-grade” status by 2016. Currently, Fluor Hanford has removed contaminated equipment from 90 gloveboxes and hoods in the main PFP building. Fluor also built and deployed a robot under the concrete “cap” of a historical “crib” or ground waste disposal site near PFP. This crib received some of the wastes transferred through the 241-Z Facility. The robot is relaying photos that are helping to define cleanup plans for equipment in the crib.



Demolition of the 241-Z Facility

To view a video about 241-Z Facility cleanout, go to [www.hanford.gov](http://www.hanford.gov) then click on Videos on the left side of the screen, and then click on “241-Z Cleanout Work Evolution.”



## Cumbersome Cleanout of 212-N Building Nearly Complete

Fluor Hanford's CP D&D Project worked through the summer to clean out the 212-N Storage Building in north central Hanford, first reported in the Spring DD&R Newsletter. The World War II 212-N Building was storing 15 large crates of contaminated equipment from the 1970s, as well as the insulating material that encased it.

The crates were tightly packed into the 212-N Building. They covered and rested on both sides of rail track that traverses part of the structure, and also lay on a mezzanine that could no longer be accessed by crane. The facility also contained large quantities of rockwool insulation that had been blown in as a fire retardant around the crates. Steel walls and part-wall partitions served as forms to hold the rockwool around the crates. Equipment and piping in the crates bearing small quantities of mixed oxide (plutonium and uranium) materials from a fabrication mission required that the 212-N Building be maintained under a nuclear Hazard Category 3 level.

Removing the crates and surrounding packing materials, overpacking or re-packaging them, and transporting them to safe interim storage in a Hanford facility built to deal with mixed and transuranic (TRU) wastes would allow the 212-N Building to be downgraded to a "radiological" facility, and would "shrink the footprint" of nuclear facilities to an area closer to Hanford's central core. TRU waste contains more than 100 nanocuries per gram of alpha-emitting TRU isotopes with half-lives greater than 20 years. Transuranic isotopes are those higher than uranium on the Periodic Table of the Elements. A nanocurie is a unit of radioactivity one-billionth of a curie.

The work proved to be more extensive than anticipated. Many of the wood crates were decaying from water that leaked through the roof. Fluor Hanford riggers, carpenters, nuclear chemical operators and radiological control personnel implemented creative approaches to handle the disintegrating crates. In addition, the crates were tightly packed, some were leaning against each other, and much of the mineral (rockwool) insulation was also soaked. In addition, scorpions, rattlesnakes and black widow spiders had made their homes in the old building, providing a further hazard to workers.

However, by September 2007, Fluor Hanford crews had succeeded in removing all of the insulation and crates, overpacked some crates, completely repackaged others, completed non-destructive analysis and preparation for shipment, and shipped them to their new home Hanford's Central Waste Complex. Department of Energy verification of the new status of the 212-N Facility as a radiological facility is expected in early October.

## Other D&D News at Fluor Hanford

In addition, Fluor Hanford retrieved approximately 8,000 drum-equivalents of buried solid waste suspected of being TRU, and made approximately 50 shipments of TRU waste from the Hanford Site to DOE's Waste Isolation Pilot Plant.

Fluor workers at the Fast Flux Test Facility continued to deactivate systems as part of facility shutdown. They removed combustibles, drained liquids, isolated water and sewer systems, and deactivated support systems. They also removed an additional transformer that contained polychlorinated biphenyls (PCBs), and made preparations to ship remaining fuel to the Idaho National Laboratory for final disposition.

Fluor Hanford also completed another round of injections of a band of ten wells in the Site's 100-N Area with a chemical compound designed to trap strontium 90 before it travels from contaminated soil into the Columbia River. The Soil and Groundwater Remediation Project also decommissioned more than 30 older wells, drilled approximately 25 new wells and two major new boreholes, initiated a treatability test in the BC Cribs and Trenches in central Hanford, and delivered three large work plans required under the Comprehensive Environmental Response, Compensation and Liability Act.

Idaho Closure Project – Contributed by: R. Kelly (Kelly.Rhodes@icp.doe.gov)  
Also, Press Releases/Excepts included from CH2M-WG

D&D crews on the Idaho Cleanup Project (ICP) will tackle the final pivotal task of their 28-month journey to decontaminate, decommission, and demolish the Engineering Test Reactor (ETR) facility - lifting the 135-ton reactor vessel out of its three-story home.

“Our primary goal from day one was safety,” said Dan Coyne, ETR project director. “We specifically selected methods and controls with the safety of our people in mind.”

To achieve its goal, cleanup contractor, CH2M-WG Idaho (CWI), isolated electrical systems, removed hazardous constituents including cadmium, PCB oils and electrical components, asbestos, mercury and over 800,000 pounds of lead; extracted miles of process piping; and grouted the reactor vessel to reduce radiation hazards.

Due to activated metal within the reactor vessel, dose rates above the core were approximately 1200R per hour. Subsequent dose rates outside the vessel varied from 60mr to greater than 2R. To minimize worker exposure, the project team decided to fill the reactor vessel with grout to a level above the core region and below the discharge to the canal.

“The density of the grout was selected to maximize the shielding capability while also ensuring the grout would flow through the affected portions of the reactor to eliminate any void spaces,” said Coyne. “We installed cameras inside the vessel to monitor the grout while it was being poured. Upon curing, we had reduced general area dose rates to approximately 10mr per hour.”

Most recently, the team detonated high-velocity explosives to remove the reactor vessel bioshield. The bioshield was composed of approximately six feet of high density concrete surrounded by a three-quarter-inch carbon steel form and was used to separate the reactor vessel from the surrounding environment. The team explored manual removal using heavy equipment and cutting torches but determined explosive removal the safer option. The demolition was controlled to prevent damaging the reactor vessel and to limit the seismic impact on a nearby operating reactor. Upon completion of the blast, the concrete was removed exposing the support shoes for the vessel.

“The results were exactly what we hoped for,” said Mark Slovak, a mechanical engineer on the blast team. “The concrete was rubblized into manageable pieces and the outer steel form was peeled away exactly the way we wanted.”

Finally, the reactor building structure was demolished to accommodate the twin gantry system that will be used to lift the reactor vessel.

In mid-September, the reactor vessel will be lifted and placed onto a multi-axle trailer for transport to an onsite disposal facility. “We have been planning this action since day one,” said Coyne. “Removing and disposing of a nuclear reactor is a big milestone for the ICP. Reactors like ETR weren’t exactly built with demolition in mind and have proven to be very challenging. We would not have been successful without our talented and motivated team.”

At startup in 1957, the ETR was the largest and most advanced materials test reactor in the world at 175 MWth (megawatt thermal).



Last tank being shipped.



ETR Bioshield Demolition



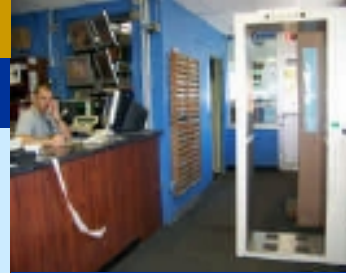
ETR Building Demolition



Washington Group  
Wins Contract  
Editor: Terry Dunford

## Drum Cell Update: Week of July 2, 2007

Drums Shipped to Date: 10,446  
Drums Packaged to Date: 11,162 Inventory in Storage: 7,516



New Gatehouse Portal Monitor

**Management Notes:** The U.S. Department of Energy (DOE) announced that it has awarded a four-year contract for management and operation of the WVDP to West Valley Environmental Services Company, LLC (WVES), a team led by Washington Group International.

The team consisting of Washington Group International, Jacobs Engineering, Parallax, and ECC brings together leaders in safety, site closure, cost management, and performance for the WVDP, a DOE environmental cleanup and waste-management project conducted in cooperation with the New York State Energy Research and Development Authority. The contract is valued at about \$159 million over the four-year period, which runs from October 1, 2007, through June 30, 2011. The scope of the cost-plus-award-fee contract includes waste disposition, decontamination, deactivation, and disposition of facilities, and infrastructure/landlord activities. The announcement came on the heels of a three-month contract extension for Washington Group subsidiary WVNSCO, which will continue to operate the site until October 1, 2007, when WVES takes over site management.

### Conduct of Operations:

WVNSCO has conducted 44 separate CONOPS self-assessments since May 14, 2007.

Items reviewed include compliance issues, material handling requirements and housekeeping walk-downs. Many of these self-assessments identified deficiencies or areas for improvement which WVNSCO is currently addressing. WVDP personnel are reminded to fix/correct and document as many of the identified deficiencies "on-the-spot" whenever possible. Items which require additional support (e.g. maintenance, engineering, etc.) or clerical assistance will be tracked until properly corrected and closed.

### Analytical Labs:

In the previous six months, achieved solidification of eight liters of plutonium waste product. In addition, successfully removed a 300 R source container and six containers with dose rates ranging from 20-30 R.

### STS Valve Aisle:

Removed 15.68 curies of cesium-137 from January 1 - June 30, 2007.

### FRS Water Treatment Area:

Removed approximately 2,000 linear feet of piping, 6 vessels & 2,000 gallons of contaminated water, along with resins and diatomaceous earth in the just completed contract period.

### Legacy Waste:

Since January 1, 2007, over 40,000 cubic feet of low level waste was processed at the WVDP. This allowed WVNSCO to be able to ship nearly the entire amount (i.e., 41,391 cubic feet) to offsite waste repositories for final disposition.

### Drum Cell:

The twelfth rail shipment comprised of four gondola cars left the site last week. The shipment included 120 "six packs" equal to 720 drums. This shipment left in conjunction with six other rail cars which were placed in transit last week. For the contract period ending June 30, WVNSCO exceeded the contract milestone of shipping 9,000 drums. In addition, following a process improvement implementation, the maximum number of drums in a single shift increased from 14 to a maximum of 79 drums.

### Remote-Handled Waste Facility:

28 waste boxes for the six-month period were processed. This accounted for 7,270 cubic feet of waste being packaged and readied for offsite shipment.



Editor:  
Terry Dunford

## Drum Cell Update: Week of June 11, 2007

Drums Shipped to Date: 6,978 Drums Packaged to Date: 8,953  
Inventory in Storage: 9,614



Maintenance Facility Demolished

Management Notes: There is nothing new to report on the status of the WVNSCO contract with DOE – the contract expires on June 30.

The U.S. Department of Energy's Laboratory Accreditation program (DOELAP) conducted an assessment of the WVNSCO Internal Dosimetry program last week. No programmatic deficiencies were identified. The assessment team will recommend that the lab be reaccredited for the next 3 years.

A few weeks ago, NTS received an unexpected surprise on a shipment it had accepted from the WVDP. When the driver un-tarped his load he discovered, much to his surprise, 3 kittens. They were probably just a few days old since their eyes hadn't yet opened. It seems that the truck driver made a stop the previous night and had observed a mother cat trying to hide kittens, but subsequently lost sight of her. The next morning, the kittens were found. After various checks (radiological and others), the truck driver expressed an interest in adopting the kittens. The adoption was approved. The driver has named the cats Alpha, Beta and Gamma!



Alpha, Beta and Gamma

### Footprint Reduction:

Demolition of TSB and Old Maintenance facilities have been completed. Size reduction and packaging of debris has also finished. Demolition contractor (DEMCO) will be demobilizing early this week. Final cleanup of demolition sites (TSB, Maintenance and Main 1 Warehouse) by WVNSCO begins this week.

### Conduct of Operations:

Participation in the enhanced CONOPS Self-Assessment (SA) Program continued aggressively this week as all scheduled SA's for the first 3 weeks of the project have been completed. Additionally, the first training session to indoctrinate Maintenance personnel in CONOPS principles per DOE Order 5480.19 and WVNSCO Procedure WV-110, "Conduct of Operations," was completed this week. Approximately 90% of the Maintenance Team received this training. Another session is scheduled next week. 2 new self-assessments were also issued this week to address Maintenance PM efforts. These will involve Preventive Maintenance procedures for both electrical and I&C efforts at the site. Finally, the general "Walk Your Spaces" self-assessment was amended to add a new section entitled, "Ladder Safety."

### Analytical Labs:

Removal of the last items (a 300R source) and 2 LLW containers will be carried out upon completion of STS activities. This is expected to occur this week.

### STS Valve Aisle:

Processing of waste drum 8 will be completed upon installation of Window D (Left MSM) which is scheduled for this week.

### FRS Water Treatment Area:

Efforts continue with the removal of the 1V12 Vessel. Vacuuming and preps for removal of final Vessel (1T1) are underway.

### Legacy Waste:

Two trailers of legacy debris were sent to Energy Solutions for disposal. In addition, two other trucks were shipped to NTS.

### Drum Cell:

The ninth rail shipment comprised of four gondola cars left the site last week. The shipment included 120 "six packs" equal to 720 drums.

### Remote-Handled Waste Facility:

Processing of Vitrification LLW containers from Waste Stream 25 is complete. The last CPC box will be moved into the cell this week to begin processing.



Editor:  
Terry Dunford

## Drum Cell Update: Week of June 4, 2007

Drums Shipped to Date: 6,270 Drums Packaged to Date: 8,514  
Inventory in Storage: 10,053



Management Notes: There is nothing new to report on the status of the WVNSCO contract with DOE – the contract expires on June 30.

Demolition of the Maintenance Shop will commence on Wednesday June 6. As reported previously, the VTF will be closed to all personnel while demolition activities are occurring on the east side of the Maintenance Shop (Maintenance Shop Addition). Demolition of the Maintenance Shop Addition is scheduled for Friday and Saturday, June 8 and 9. Accordingly, personnel will not be permitted to enter the VTF during demolition activities on Friday, June 8 and Saturday, June 9. If a situation arises wherein personnel must enter the VTF during demolition activities, they must co-ordinate the entry with the Demolition Work Group Supervisor so that demolition operations can be halted while personnel enter the VTF. Maintenance personnel, who will be working on-site between 7 a.m. and 5 p.m. on Friday and Saturday, should plan on staging items they will need to perform their work at an alternate location before 6 a.m. on each of these days.

During all four days of the Maintenance Shop demolition, the roadway between the Maintenance Shop and VTF will be closed to both vehicular traffic and pedestrian traffic. Pedestrians must follow the alternate walk path to the VTF, as shown on the demolition posters placed at several locations around the site and at the AOC. At the end of the demolition shift (approximately 5 p.m.), the roadway will be reopened.

Demolition of the Maintenance Shop is expected to be completed by the close of business on Saturday, June 9, but has the potential of extending into Monday, June 11.

### Footprint Reduction:

Demolition of TSB has been completed. Demolition of Old Maintenance facility will begin later this week.

### Conduct of Operations:

WV-110 (Conduct of Operations procedure) has been revised and issued to include maintenance activities. Seven additional CONOPS self-assessments have been performed this week with the General Safety Self Assessment modified to now include Lines of Inquiry addressing permits, ergonomics and personal hazards. Self-assessments to address Preventive Maintenance procedures for both Maintenance Instrumentation and Control and electrical activities are currently being generated.

### Analytical Labs:

Removal of the last item (a 300R source) is scheduled for early next week. Project on schedule.

### STS Valve Aisle:

Processing of waste drums 7 is complete. Waste drum 8 is in progress. Project on schedule.

### FRS Water Treatment Area:

Efforts continue on removal of final two tanks and associated piping.

### Legacy Waste:

One trailer of legacy debris was sent to Energy Solutions for disposal. In addition, three trucks containing legacy debris and one project waste box were shipped to NTS.

### Drum Cell:

The eighth rail shipment comprised of four gondola cars left the site last week. The shipment included 120 "six packs" equal to 720 drums.

### Remote-Handled Waste Facility:

Processing of Vitrification LLW containers from Waste Stream 25 continues. Seven of eight boxes have been processed to date.

Decommissioning and demolition of the old Plant Hospital Building at Atomic Energy of Canada Limited (AECL), Chalk River Laboratories (CRL) was completed recently. Constructed in 1954, the structure was identified as Building 464. Doctors, nurses and laboratory and x-ray technicians worked in what was considered to be an advanced facility at the time, providing employees with medical checkups, x-rays, blood tests and treatment on site at CRL.

The hospital operated until 1990, when a decision was made that medical treatment requiring a doctor could be better handled at the Deep River and District Hospital in the nearby town of Deep River. Building 464 was transformed into a health center at this time, and continued to house radiation biology laboratories, environmental technology laboratories, and added industrial hygiene laboratories and occupational health and safety offices. In 1995 a decision to transfer the occupants within the facility elsewhere and shut down the building operations in preparation for its eventual decommissioning and demolition was made by the Senior Management Team at CRL.

The Plant Hospital was transferred to Decommissioning in July 2006 after the completion of Safe Shutdown of the facility. The Decommissioning and Demolition Project began in the same month, and was completed in two phases. During the first phase, all floor tiles from various rooms, carpets, laboratory furniture, and wall and floor coverings in laboratories were removed. This phase yielded some radioactive waste, which was segregated. Prior to proceeding to the second phase, a final release survey was conducted which indicated that the debris from demolition would qualify for free release off site.

During the second phase, all asbestos materials, PCB containing materials, lead and other hazardous waste were segregated and disposed of in a compliant manner. Large equipment from the second-floor laboratories was also removed at this time.

The fire alarm, fire detection and fire suppression systems remained in service as long as possible during the demolition phase. On Tuesday, March 13, 2007, the building was placed on 24-hour fire watch when the fire systems were shutdown. Demolition began late afternoon on Friday, March 16, and the structure was completely demolished by 4 p.m. the following day with only a small portion of the foundation remaining to be removed. All told, 79 tandem truckloads of waste were monitored, weighed on site and shipped to an offsite landfill. This represented over 95% of the waste (by volume) from the building. All recyclable materials were sent for processing at the CRL recycling facility and free-released from the CRL site. "From a project perspective, the demolition was a success," said Mary ter Huurne, B464 Decommissioning and Demolition Project Manager, "but at the same time it's the end of an era, with the removal of one of our oldest site buildings."

The Building 464 Decommissioning and Demolition Project was funded by the Government of Canada through Natural Resources Canada (NRCAN) and the Nuclear Legacy Liabilities Program. This Program is aimed at safely and cost-effectively reducing legacy liabilities related to past operations at AECL sites. AECL is implementing the Program through its Liability Management Unit, with NRCAN providing policy direction and oversight. The project was completed safely, on-time and on-budget with the support of numerous individuals, groups and contractors.



Before Demolition



During Demolition



After Demolition

## PROFILE: DECONTAMINATION AND DECOMMISSIONING SCIENCE CONSORTIUM (DDSC) (Eric Abelquist, ORISE and Larry Boing, ANL)

The Decontamination and Decommissioning Science Consortium (DDSC) is a consortium of decommissioning expertise that offers regulators and problem holders experience based decommissioning resources/solutions and draws upon other industry and worldwide resources currently scattered across numerous websites, documents and other information sources. The DDSC maintains a decommissioning topical website [www.ornl.gov/ddsc/](http://www.ornl.gov/ddsc/) on subjects of importance to Federal and State regulators, operators, contractors, stakeholders and others involved or interested in decommissioning. The DDSC website provides a continuous education opportunity by sharing worldwide decommissioning and related topic news, a lessons learned source for all decommissioning professionals and easy access to the latest regulations and guidance, projects and program status and emerging decommissioning issues. The website has been active since 2003.

The DDSC provides a cost-effective, user-friendly approach to those tasked with staying abreast of the increasing number of technical decommissioning information resources available, as well as providing a launching point for the growing number of regulators and professionals newly assigned to the complex decommissioning field. The centralized website pulls together resources from the many D&D disciplines from an operational standpoint, addressing the needs of both domestic and international D&D professionals.

## DDR WEBSITE UPDATE/HIGHLIGHTS (John Gunning, [gunningje@ornl.com](mailto:gunningje@ornl.com))

The DD&R web site ([ddrd.ans.org](http://ddrd.ans.org)) continues to be an excellent and current source of information for Division members. It provides a convenient way to identify and Division Officers and/or members of the Executive Committee so that you can readily provide your input to them. The web site also provides notices of upcoming meetings of interest to the Division, and includes other miscellaneous material such as the Mission, Bylaws, Operating Manual, and Five Year Plan for the Division. Current as well as prior copies of the outstanding DD&R Newsletters are accessible through the Members Only portion of the web site.

The website homepage also includes changing photos of activities at various decommissioning sites. Each time one goes to another page on the site and returns to the home page, two different photos are displayed on the homepage.

All members are encouraged to review the site and let John know if any information is incorrect or outdated, or if you have suggestions for improvements.

Over the last year, the website averaged about 8,730 hits per month.

## DDR MEMBERSHIP NOTICE

The DD&R needs new members. How about helping out by telling your friends and colleagues about us! Consider those working on projects in the nuclear decommissioning industry or plant refurbishments for reutilization. Especially consider our international friends too. The DD&R can help them directly lower their decommissioning costs or build in decommissioning technologies to reduce the total plant life cycle cost.

## ONE TIME OFFER !!!!!

The DD&R is offering the first 25 new members joining the ANS and assigning the DD&R division as their primary division a one time offer to pay ½ of their first year membership fee. DD&R member benefits include:

- Opportunities to network with leaders in the nuclear industry
- Receiving our semi-annual DD&R newsletter (members only)
- Special pricing on publications related to decommissioning
- Recognition awards from peers for exceptional performance
- Opportunity to help develop future industry policies

The ANS DD&R looks forward to having you, a valued member, help us expand so we can better represent our industry. Get the word out now!

Visit our website for more details: <http://ddrd.ans.org>



New members have joined in 2007:

Armatta, Steven M.	Brock Specialty Services	Lewis, Sherry	Defense Nuclear Facilities Safety
Ascione, Edoardo	Fagioli Inc.	Lientz, Amy	CH2M-WG Idaho, LLC
Ayres, David C.	University of Florida	Love, Gregory	Western Michigan University
Bassett, Brandalyn	University of Utah	McLellan, Edward	Laser Decontamination, Inc.
Brickey, James	U.S. Army	McTaggart, Jerri	Los Alamos National Laboratory
Broyles, Alex	Texas A&M University	Maggio, Samuel	ICM – International Climbing Machines
Bruce, Mark	Day & Zimmermann NPS, Inc.	Mershon, Donald	Nexus Technical Services Corporation
Brunett, Acacia	Ohio State University	Miller, Richard	Marathon Consulting Group
Candee, Glendeen	Southern Pines Trucking, Inc.	Miller, Stephen	AFRRRI
Crawford, Gordon	EnergySolutions	Miller, Zachary	N/A
Daniels, Robert	EnergySolutions	Mock, Angela	All Girls Trucking
Danjaji, Musa	South Carolina State University	Mullen, Lisa	Bluegrass Concrete Cutting, Inc.
Devine, John	Polestar Applied Technology	Mullens, Robert	Nuvision Engineering
Elder, George	Bradtec Decon Technologies LTD	Palmieri, Ralph	Lockheed Martin Global
Fukasawa, Tetsuo	Hitachi Ltd.	Palmos, Jay	Construction Delay Law
Garcia, John	Los Alamos National Laboratory	Partridge, Johnathan	Fluor Corp
Giefer, David	Harrisburg Area Community College	Richard, Joshua	University of Florida
Glucksberg, Nadia	MACTEC, Inc.	Sependa, Walter	Fluor
Goddard, Michael	Ohio State University	Shyloski, Edward	The Shaw Group, Inc.
Hadgu, Hiruy	University of Michigan	Small, Alan	Shaw Stone & Webster
Hanson, Roland	Southern California Edison	Spears, Annie	Southern Nuclear - Farley
Hopkins, Andrea	Fluor Hanford	Straccia, Frederick	Radiation Safety and Control Services
Husnu, Mehmet	Cardinal Health	Sundstrom, Carl	SC&A, Inc.
Hwang, Yeseul	University of Illinois at Urbana-Champaign	Strelczuk, Adam	Electric Boat Corporation
Jenkins, Alistair	British Nuclear Group	Swift, Lawrence	QSA Global, Inc.
Jonsson, Graham	Nexia Solutions	Turnmire, Stephen	University of Idaho
Kamath, Manjeshwar	Black & Veatch	Trama, Jean-Christopher	CEA
Kanney, Joseph	Sandia National Laboratories	Wagner, Jeffrey	Babcock Services, Inc.
Killebrew, Korbie	General Atomics, Inc.	Wang, Jai-Baau	Institute of Nuclear Energy Research
Kwon, Sung Hwan	KOPEC	Weber, David	American Crane & Equipment Co.
Lawes, Cynthia	British Nuclear Group, Magnox	White, Greg	Project Services Group
LeBlanc, Paul	ICESOLV, Inc.		