DECONTAMINATION DECOMMISSIONING AND REUTILIZATION DIVISION

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DISCLAIMER

The DDR Newsletter is a publication prepared by the DDR Division Newsletter Editor with input from various information providers for each issue for DDR Division Community review and use. Access to the newsletter is a benefit of membership in the ANS DDR Division. It is a semi-annual publication normally issued in the Spring and Fall of each year. Please encourage colleagues who may have an interest in our newsletter and other DDR activities to join us in the ANS, and especially the DDR Division. Membership details for joining the DDR Division can be located at the division's website: ***http://ddrd.ans.org***.

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***. *If you have any recommendations regarding any aspect of the newsletter, these are welcome as well.*

CHAIR'S MESSAGE

Welcome to the Fall 2006 edition of the ANS-DDR Division newsletter. I would like to extend a special thanks to Steve Horvath of Energy*Solutions* **shorvath@energysolutions.com** in Oak Ridge, TN who has assumed the job of Newsletter Editor. We look forward to some exciting enhancements to the newsletter in the future. I am sure that many of you have already been talking with Steve and more of you will be in the future.

MEMBERSHIP - We are always looking for new ideas to further develop our member roster and for ways to further diversify our membership. The price for annual membership is well less than $1 a work day. It's up to each and every one of you to tell someone else in the DDR industry about the benefits of membership in our division and what we are all about. For example - share one sample copy of the newsletter with a friend or other groups of colleagues, ask them to share it with some friends which hopefully gets their interest and gets them to join ANS and DDR. Post announcements such as 'Calls for Papers' and other DDR sponsored meeting flyers – like DDR207 – in the workplace or take them along to other relevant meetings and make them available to attendees. Tell others about our DDR website. Don't be shy to tell others about what a great deal the ability to network with industry peers and to get on the inside track can do for them by becoming a part of the DDR division. We are planning on continuing on-going new member incentive programs as well. Sue Aggarwal **saggarwal@nmg.org** is the Membership Chair.

DDR2007 TOPICAL CONFERENCE – Jim Byrne **jbyrne4424@comcast.net** and Joe Carignan **jecarignan@aol.com** are working with ANS-HQ in planning for the DDR2007 event in Chattanooga, TN, September 16-19, 2007. So let's get busy and submit an abstract via the ANS meetings website portal at **www.ans.org**. Encourage a colleague to submit an abstract as well. Consider some pre-conference or post-conference time in the southeastern US region. After all, no trip is complete to the Chattanooga area without a visit to the infamous 'Rock City'. We expect strong international participation from: 1) co-sponsorship arrangements with several other larger nuclear societies for this conference, and 2) attendees from the many decommissioning projects underway worldwide who like to attend a focused conference like this one.

STANDARDS – Larry Zull is chairing the Standards Committee and he is looking for DDR members that would like to work on development of DDR standards in our newly launched joint effort with ASTM in this area. Work is just getting started - so please contact Larry **larryz@dnfsb.gov** to get involved in this initiative.

Please feel free to contact myself **lboing@anl.gov** or any of the other DDR Officers or Executive Committee members with input or feedback. We are always looking for input to improve the conduct of our activities where possible.

Larry Boing
Chairman

2007 DDR TOPICAL MEETING

The next Decommissioning Topical Meeting is scheduled for September 16 – 19, 2007 in Chattanooga, Tennessee. The theme of the meeting is capturing lessons learned. With many large projects finishing, now is an important time to gather the best practices from around the decommissioning industry so that they can be preserved for future decommissioning projects.

This meeting follows a successful 2005 meeting in Denver, which had approximately 300 attendees about 1/3 of which were from overseas.

Paper summaries are due by January 30, 2007. So if you have a story to tell, go to the meeting website, which is found at **www.ans.org/meetings/ddr** for further information on the meeting and how to submit a paper summary or contact Jim Byrne at **jbyrne4424@comcast.net**.

MEMBERSHIP UPDATE

During the past 6 months (April through October 2006), the membership of the ANS DDR division has increased by 52 new members. A listing of these new members and their respective organizations is presented below. When convenient and as we deal with them, please welcome them to our Division. Thanks to **Sue Aggarwal**, **DDR Membership Chair**, and others for their ongoing efforts to promote Division membership.

NAME	COMPANY	NAME	COMPANY
Mr. Roger T. Baldwin	Xenogenesis	Mr. Benjamin J. Kupka	MPW Industrial Services
Mr. Darryl Borland	Vanderbilt University	Mr. Timothy I. Martinson	Canberra Industries, Inc.
Mr. Donald A. Brown	Techcom International	Mr. Gurcharan S. Matharu	Entergy Operations, Inc.
Mr. Raymond Burke	Entergy	Mr. Norman M. Meinert, P.E.	N/A
Mr. Xiang Chen	Univ Of Illinois At Urbana-Champaign	Mrs. Margaret A. Melberg	CH2M-Hill
Mr. Jeffrey L. Clark	Washington Safety Mgmt Solution	Mr. Mark A. Mitchell	N/A
Ms. Jennifer L. Dalzell	Ohio State University	Mrs. Donna S. Moser, P.E.	Veterans Affairs
Mr. George M. Davis	Hukari Technical Services, Inc.	Ms. Haruko Murakami	University Of CA / Berkeley
Mr. Matthew J. Deacon	University Of Pittsburgh	Mr. Ryan F. Murdock	Idaho State University
Ms. Georgette A. Diab	General Electric	Dr. Martin G. Plys	Fauske & Associates, LLC
Mr. Alan Dimond	TSSD	Mr. Dwaine R. Pucket, Jr.	BWXT/Y-12 Plant
Mr. Brian K. Donahoe	Rigging International	Ms. Deborah A. Ramsey, P.E.	Hanson Professional Services Inc.
Mr. Joel W. Duling	BWXT Services, Inc.	Mr. Michael J. Rhodes	Atomic Energy Of Canada, Ltd
Mr. James A. Fennema, P.E.	MOTA Corporation	Mr. Jim V. Rouse	Virotec
Dr. Jean Fontaine	CEA	Mr. David G. Ruscitto, P.E.	MWH, Inc.
Dr. Rosa A. Gonzalez	R. Gonzalez Consulting, Inc.	Mr. David P. Scowcroft, P.E.	British Nuclear Group
Mr. Craig F. Grochmal	Shaw Env. & Infrastructure, Inc.	Mr. John A. Simmons, P.E.	Washington Group International
Mr. Jack S. Hobbs	Penhall Company	Mr. Scott R. Stanton, P.E.	Tri Tool, Inc.
Mr. Ian S. Howard	DeNuke Services	Mr. Gary J. Storr	Bullard
Mr. Nathan H. Hurt, P.E.	N/A	Ms. Melissa M. Suda	Jefferson College
Mr. Gerald T. Jannik	WSRC/SRNL	Mr. Bill Sundeen	American DND, Inc.
Mr. Phillip David Pearse Jones	Three Rivers Community College	Mr. Evgeny A. Taskaev	Analytics, Inc.
Ms. Marisa Kane	KI Pills, Inc.	Mr. Andrew H. Thatcher	Nextep Environmental, Inc.
Mr. William E. Kirby	Aegis Engineering LLC	Mr. David M. Wagner, P.E.	Bechtel Power Corp
Mr. Christopher Kovach	Fidelity	Mr. Gary T. Wolfram	University Of Florida
		Mr. Greg Wood	Canal Barge Company

DDR 2007 ELECTION

The 2007 DDR elections for officers and new Executive Committee (EC) members will take place early in the first half of 2007. The attached slate of candidates was filed with ANS-HQ on November 17, 2006 and the candidates are willing to serve and meet the required meeting participation requirements if elected. The ballots will be mailed out to DDR members for the DDR election by ANS on March 12, 2007 and all ballots must be received back by ANS no later than April 23, 2007.

The new terms for the officers and elected EC members will start after the close of the June 2007 meeting in Boston for both the officers and the EC members. The EC members will serve 3 year terms (June 2007 - June 2010) and the officers will serve a 1 year term (June 2007 – June 2008), with the exception of the Vice Chair who steps up to Chair in the year following the Vice Chair term.

The table below lists the current field of candidates for various positions. As you can see, we have a diverse and very well qualified group of individuals that have agreed to run for the open positions. On behalf of the DDR Division, I would like to thank each of them for agreeing to actively support the DDR Division of ANS. We all realize this requires a significant commitment on the part of the individuals and their companies. I wish each of them good luck in the upcoming election.

Joe Carignan
Chair, Nominating Committee

POSITION	CANDIDATE(S)
CHAIR	Mr. John D. Parkyn - Chairman of the Board - Private Fuel Storage, LLC
VICE CHAIR	Dr. John E. Gunning - Nuclear Science & Technology Division - Oak Ridge National Laboratory
SECRETARY	Mr. Art Paynter - afrancis
TREASURER (1 to be selected)	Mr. Gene Gleason - Vice President, Sales and Marketing - MHF Logistical Solutions
	Mr. Glen A. Rae - Energy*Solutions*
EXECUTIVE COMMITTEE (3 to be selected)	Mr. Andrew Szilagyi - U.S. Department of Energy - Office of Environmental Management EM60
	Mr. Martin W. Bourquin - Environmental Health and Safety Manager - Grace Davidson - W.R. Grace & Co.
	Ms. Alison Arrowsmith - Proposal Manager - Perma-Fix Environmental Services
	Mr. Scott Altmayer - Manager of Nuclear Services - TolTest, Inc.
	Mr. Harvey Story – AREVA
	Dr. Andreas Kronenberg - Oak Ridge Associated Universities (ORAU)
EXECUTIVE COMMITTEE (Non-U.S. Resident) (1 to be selected)	Mr. Gale Voyles - Genesis Energy - Didcot, Oxfordshire - United Kingdom
	Mr. Randall Ridgeway - Atomic Energy of Canada, Ltd (AECL)

DDR WEBPAGE

The DD&R web site (**ddrd.ans.org**) continues to be an excellent resource for Division members. It provides a convenient way to identify and contact 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 web site was recently significantly revised to change the 'look and feel' as well as make it easier to navigate. The DD&R website continues to be one of the best Division web sites within the ANS organization.

A plan is also in the works to include submitted photos of activity at DD&R sites. An email will soon be distributed to all ANS DD&R Division members soliciting their submittals. The photos will then be available via the website in some sort of organized fashion that will be determined after the photos are submitted.

All members are encouraged to review the site and let John know if any information is incorrect or outdated, or if anyone has suggested improvements.

John Gunning
Website Chair
gunningje@ornl.gov

D&D PROGRAMMATIC AND PROJECT-SPECIFIC DECOMMISSIONING UPDATES

PROGRAMMATIC

NUCLEAR REGULATORY COMMISSION..... Contributed By: Claudia Craig [cmc1@nrc.gov]

Update of Consolidated Decommissioning Guidance (NUREG-1757)

The Division of Waste Management and Environmental Protection (DWMEP) has completed its update of NUREG-1757, "Consolidated Decommissioning Guidance," which provides guidance for planning and implementing license termination under the License Termination Rule (10 CFR Part 20, Subpart E). The staff has published revisions to Volumes 1 and 2 of this NUREG series.

The first volume is "Consolidated Decommissioning Guidance: Decommissioning Process for Materials Licensees" (NUREG-1757, Vol. 1, Rev. 2), which provides guidance for planning and implementing the termination of materials licenses.

The second volume, "Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria" (NUREG-1757, Vol. 2, Rev. 1), provides guidance for compliance with the radiological criteria for termination of licenses.

The revised Volumes 1 and 2 include the finalized guidance of NUREG-1757, Draft Supplement 1, which was published for public comment in September 2005. The guidance is intended for use by NRC staff, licensees, and others. All three volumes of NUREG-1757 are available at **http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757**.

Consolidation of the NRC's Decommissioning Program

On October 1, 2006, the project management and oversight responsibility for 14 decommissioning Research and Test Reactors (RTRs), 2 decommissioning power reactors, and 2 early demonstration reactors transferred from the Office of Nuclear Reactor Regulation (NRR) to the Office of Federal and State Materials and Environmental Management Programs (FSME). Additionally, the project management and oversight of uranium recovery facilities, including decommissioning facilities, was also transferred to FSME.

The decommissioning activities were consolidated into the Division of Waste Management and Environmental Protection (DWMEP) as a result of a Staff Requirements Memorandum (SRM) requesting

the staff to evaluate further consolidating the decommissioning program. Based on the evaluation, the staff determined that consolidating the decommissioning program would increase the efficient and effective use of resources and further concentrate the decommissioning technical expertise in one organization. The Decommissioning and Uranium Licensing Recovery Licensing Directorate in FSME now provides decommissioning project management and oversight activities for complex materials sites, power reactors, RTRs, and uranium mill tailing sites in addition to providing decommissioning programmatic support to the regions and other offices involved in decommissioning activities.

INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA) ..... Contributed By: Michele Laraia [M.Laraia@iaea.org]

Stakeholder Involvement and Interactions in Nuclear Decommissioning: The Position of the IAEA

Introduction

Over the past decade or so, radioactive waste management institutions have become progressively more aware that technical expertise and technical confidence are insufficient, on their own, to justify waste management solutions to a wider audience, or to see them through to successful implementation. Because of changes in society's decision-making environment and heightened public sensitivity to all matters connected to environmental protection, nuclear power, radioactivity, and especially radioactive waste, any decision regarding whether, when and how to implement waste management solutions will typically require thorough public examination and the involvement of many relevant parties. The latter includes waste management agencies, safety authorities, local communities, elected representatives, and technical intermediaries between the general public and decision-makers. In particular, the decision-making process is highly dependent on parties' involvement, when risks and benefits are largely shifted in time. This is already an important issue for the development of waste repositories, and it is clear, by way of public protest, that the public are increasingly demanding to influence decisions. As a major waste management activity, decommissioning of nuclear facilities is fully subject to the above-mentioned considerations. Decommissioning also includes aspects additional to waste management, which are of interest to a wider range of stakeholders. The way in which local communities, the public in general, and a wide range of other parties are engaged in dialogue about decommissioning of nuclear facilities is likely to become an increasingly important issue as the scale of the activity grows.

Objective

The rationale of a document in preparation at the IAEA is that decision making, in the context of projects which have an impact on communities and their environment, as well as on more distant interests, is increasingly being implemented with the involvement of those affected by the project – "the stakeholders". It is clear that decommissioning projects fall into this category and there is already experience of related decisions in some Member States having involved stakeholders. It is important for all concerned in decommissioning projects to understand the issues that may affect decisions and be able to gain from the experiences already obtained in other countries. It is recognised, however, that all experiences may not be universally relevant and that some issues have a particular national character.

The main objective of this document is to gather information on stakeholder impacts from/on decommissioning and related issues in Agency's Member States. In this regard the document is intended to address the wide range of diverse environmental, socio-political, economic and cultural environments of the IAEA Member States, rather than the more uniform features of individual countries or the narrower membership of other international organizations. It is expected that the document will improve awareness, amongst those who are about to become responsible for and involved in decommissioning projects, of the range of issues which may be of concern to stakeholders and approaches that have been used to reconcile them. In the past, factors negatively affecting the decision-making process have been numerous, e.g. the lack of communication between waste producers, decommissioning managers, regulators, and local authorities, the limited access to information and restricted involvement for the local stakeholders regarding essential decisions for the long term on their environment, the short-term interest of politicians with regard to the long time scale of the issues at stake, the way uncertainties are sometimes dealt with, etc.

Finally, this document is grounded on international principles and treaties - such as the Rio and Aarhus Conventions. For example the Aarhus Convention [1] establishes a number of rights of the public (citizens and their organizations) with regard to the environment. Public authorities (at national,

regional or local level) must contribute to allow these rights to become effective.

The convention provides for:

- The right of everyone to receive environmental information that is held by public authorities. This can include information on the state of the environment, but also on policies or measures taken, or on the state of human health and safety where this can be affected by the state of the environment. In addition, public authorities are obliged to actively disseminate environmental information in their possession;

- The right to participate from an early stage in environmental decision-making. Arrangements are to be made by public authorities to enable citizens and environmental organizations to comment on, for example, proposals for projects affecting the environment, or plans and programmes relating to the environment, these comments to be taken into due account in decision-making, and information to be provided in the final decisions and the reasons for it;

- The right to challenge, in a court of law, public decisions that have been made without respecting the two aforementioned rights or environmental law in general [2].

It is recognised that international conventions provide a high-level framework that promotes and gives credibility to effective engagement of stakeholders. Interpretation of these conventions will vary between Member States leading to differing approaches both to decommissioning and to stakeholder engagement. Coupled to this is the wider variety of social, economic, political and cultural differences between countries, which needs to be taken into account when interpreting and using this guidance document.

Scope

It should be noted that the term “stakeholders” in the context of nuclear activities is often used to designate the public and specific segments of it. This is not the case for this document, where the public in general and public opinion groups are only a few stakeholders among many. In fact, Fig 1 (from the BR-3 decommissioning project, Mol, Belgium) shows that the stakeholders’ interactions even in a relatively minor decommissioning project can be complex –even without consideration of the public stakeholders.

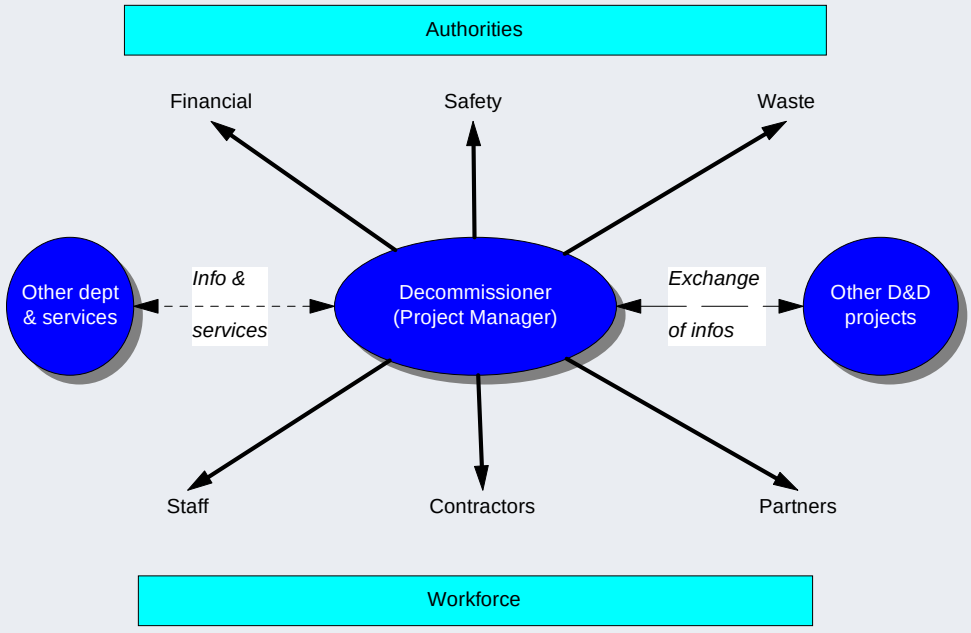


Fig. 1. Minimal links and info streams for the dismantling of research reactors

This document also recognizes that stakeholders are not necessarily those living in the vicinity of a nuclear facility being decommissioning, but could be physically situated anywhere. In a world which is rapidly becoming a “global village”, impacts from a major decommissioning project can be felt thousands of kilometres away.

Finally, this document is not intended to provide specific guidance. The diverse social, political, economic, and cultural environments of IAEA’s Member States would render this task prohibitive. Rather, this document aims at identifying a large spectrum of possible stakeholders, factors important to their constitution, and concrete or perceived interactions vis-a-vis the decommissioning process. It will be up to individual Member States to determine the applicability of generic issues or reported case histories to their own conditions.

Stakeholders Relevant to the Decommissioning Process

The Environment Council in the UK [3] considered the relationship of particular stakeholder groups to the issue or decision under consideration. The questions listed below help identify a comprehensive range of stakeholders:

- Who is directly responsible for decisions on the issue?
- Who is influential in the area, community of organisation?
- Who will be affected by any decisions on the issue?
- Who holds positions of responsibility in stakeholding organisations?
- Who can promote a decision providing they are involved?
- Who can obstruct a decision if they are not involved?
- Who has been involved in the issue in the past? (use existing lists as a reference)
- Who has not had a voice in the issue before, but should have?

As the previous discussion showed, distinctions among concerned groups aid in understanding their needs and likely roles. Some facility owners starting a decommissioning project have also found it useful to distinguish among various segments of their stakeholders in order to tailor a successful approach to public participation. In effect, they divide stakeholders into segments based on the impacts of the project and location of the stakeholder. Such an approach can distinguish between the local organizations and the general public not residing in a defined impact area, such as that defined by a perimeter 100 km from the facility.

Table 1 lists stakeholders that have been identified as relevant from a general point of view. The sequence in the table does not suggest any ranking or priority. The list given here does not claim to be exhaustive; local circumstances for a particular project may include other stakeholders. Vice versa, there will be a number of countries or local conditions where certain stakeholders would be totally irrelevant. The long list of possible stakeholders can be considered and presented in a number of categories. In Table 1 below, under the headings of economic, environmental, social and technical considerations, stakeholders’ primary (underlined) and secondary (*italics*) areas of interest or concern has been identified.

TABLE 1

ECONOMIC	SOCIAL
Facility owner	Local communities
Real estate owners	Tribal nations
Government	Archaeology, history, museums, archives
Funding authorities, shareholders, ratepayers	Media
Institutions	Pro- and anti-nuclear groups
Local authorities	Trade unions
Local communities	Government
Trade unions	Institutions
Managers / operating organisations	*General public*
Waste managers	*Teachers, students and universities*
Nuclear industry at large	*Visitors*
Non-nuclear industry	*Pressure groups / NGOs*
Service providers and partnerships	*Operations staff*
Regulators	*Managers / operating organisations*
General public	
Tribal nations	
Media	
International stakeholders	
Pressure groups / NGOs	
Operations staff	
Future generations	
Security	

ENVIRONMENTAL	TECHNICAL
Regulators	Operating organization
Visitors	Regulators
International stakeholders	Research / Scientists
Pressure groups / NGOs	Teachers, students and universities
Pro- and anti-nuclear groups	Operations staff
International stakeholders	Waste managers
Future Generations	Security
Government	Emergency services
Tribal nations	*Institutions*
Research / Scientists	*Visitors*
Institutions	*Trade Unions*
Local Authorities	*Nuclear industry at large*
Teachers, students and universities	*Non-nuclear industry*
Archaeology, history, museums, archives	*Service providers and partnerships*
Media	
Trade unions	

One should note that under any possible scheme, a given group of stakeholders can be attributed to several categories. For example, local communities can be represented by their elected officials or be driven by self-established pressure groups. Similarly, local universities could decide to merge their interests with local communities' or act on their own. Inevitably Table 1 reflects some measure of subjectivism.

Journalists watching waste container activities at the Vandellos Nuclear Power Plant decommissioning project in Spain.

References

[1] UN ECONOMIC COMMISSION FOR EUROPE (UNECE), 13. Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Aarhus, Denmark, 25 June 1998; website: http://untreaty.un.org/English/notpubl/27-13eng.htm.

[2] TAYLOR, D.M., WEBSTER, S., Involving the Public in the Management of Radioactive Waste – the European Union's Legislative and Research Initiatives, Proc. of WM'05, 27 Feb – 3 March 2005, Tucson, AZ, Waste Management Symposia Ltd (2005).

[3] THE ENVIRONMENT COUNCIL, multiple references and background including "BNFL National Stakeholder Dialogue", www.the-environment-council.org.uk.

D&D PROGRAMMATIC AND PROJECT-SPECIFIC DECOMMISSIONING UPDATES

COMMERCIAL NUCLEAR UTILITIES

BIG ROCK POINT ..... Contributed By: Tim Petrosky [tdpetrosky@cmsenergy.com]

Consumers Energy Count on Us

News Release

HUNDREDS GATHER TO CELEBRATE RETURN OF BIG ROCK POINT NUCLEAR PLANT SITE TO GREEN FIELD STATUS

CHARLEVOIX, Mich., Aug. 29, 2006 – More than 700 former and current workers, elected officials, and business and nuclear industry leaders gathered today to celebrate the return of the Big Rock Point nuclear plant site to a green field.

Consumers Energy operated the nuclear plant for 35 years, then decommissioned and restored the plant site. After the expected approval from the U.S. Nuclear Regulatory Commission, about 475 acres and 1.5 miles of Lake Michigan shoreline will be available for use without any restrictions.

"As the first commercial nuclear plant in Michigan, Big Rock Point and its workers were pioneers in safely employing the atom for electrical generation," said David Joos, Consumers Energy's chief executive officer and a former Big Rock Point employee. "The plant and its workers continued that leadership throughout decommissioning and site restoration by again employing a number of innovative practices and processes to safely return the site to a natural state. Today, we celebrate the results of their work and dedication."

Big Rock Point was shut down permanently on Aug. 29, 1997 after 35 years of providing electricity for Consumers Energy customers. Workers have been decommissioning and restoring the site for the past nine years. All the former nuclear plant structures have been removed and the area restored to a natural state.

"Consumers Energy has fulfilled its promise to return this spectacular piece of property to a condition much as we found it more than 45 years ago," said Robert Fenech, Consumers Energy's senior vice president of nuclear, fossil and hydro operations. "While this milestone truly is one to be remembered and celebrated, we also are here to remember and celebrate the significant contribution that this small, 67-megawatt plant made to the entire nuclear industry and the contribution that the plant workers made to this community."

Big Rock Point was named a Nuclear Historic Landmark for its many contributions to the nuclear and medical communities. It was Michigan's first, and the nation's fifth commercial nuclear plant.

At the time of its closing in 1997 it was the nation's longest running and oldest operating nuclear plant. The plant achieved a number of operational and decommissioning milestones that have helped set industry standards.

"For the past nine years we have lived through a transition from the nation's longest running nuclear plant into an internationally recognized leader in the decommissioning process," said Kurt Haas, the Big Rock Point site general manager. "Through it all we have never lost our focus on our three main goals of safety, efficiency, and preparing our workers for their next challenge.

"Today I am proud to say that we have completed our mission. This achievement is a direct testament to the skills, talent, and professionalism of the men and women who built the plant, then safely operated it for 35 years, and now, fittingly, have returned this site to a natural state," Haas said.

Big Rock Point began generating electricity in 1962 and operated safely for until its permanent shutdown on Aug. 29, 1997, the 35th anniversary of the plant receiving its operating license from the U.S. Atomic Energy Commission, the forerunner of the U.S. Nuclear Regulatory Commission. Consumers Energy decided to shut down the plant because its small size and a deregulating electric industry made it uneconomical to continue operation. More than 1,000 people attended the shutdown ceremony, which was broadcast live from the plant control room.

Decommissioning and site restoration began after the shutdown. All equipment, buildings and structures were surveyed prior to removal or demolition to make sure they were disposed of in the appropriate manner.

All material classified as low-level radioactive waste was disposed of in licensed facilities in Utah, Tennessee or South Carolina.

The plant's spent nuclear fuel is stored in dry fuel storage containers located on Consumers Energy property near the plant site. It will remain there until the U.S. Department of Energy meets its obligation to accept and store spent fuel from commercial nuclear plants.

A State of Michigan Historical Marker and a permanent landmark honoring the achievements of the plant and its workers will be located on or near the plant site. The landmark was funded entirely by donations from former and current plant workers and business friends of the plant. The landmark

utilizes steel from the former containment sphere in its design.

Consumers Energy, the principal subsidiary of CMS Energy, provides natural gas and electricity to nearly 6.5 million of Michigan's 10 million residents in all 68 Lower Peninsula counties.

# # #

For more information about Consumers Energy, visit our Website at www.consumersenergy.com

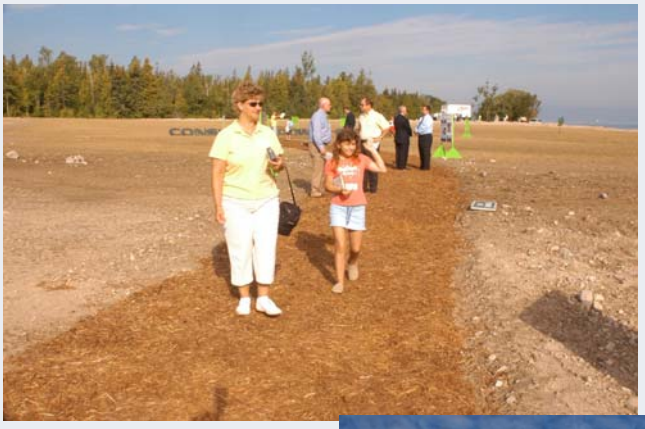
FOR MORE INFORMATION CALL:
Tim Petrosky
231-547-8177

Photographs depicting the construction, operation and decommissioning of Big Rock Point are available by contacting Vicki Walton at 517-788-2233.

Dismantlement operations at Big Rock.

Big Rock Point steam drum in route to a disposal site in Utah.

Greenfield condition achieved and celebration in August 2006:



Completion of Decommissioning and Site Closure

Major demolition of the former Connecticut Yankee nuclear plant was successfully completed in August 2006. Physical decommissioning, including demolition of a few remaining ancillary buildings, is scheduled to be completed by the end of 2006. Waste shipments are also scheduled to be completed by the end of the year with 365 million pounds of decommissioning waste shipped since demolition began in 2003. The plant site surpassed the 6 million safe work hour and six years since the last Lost Time Accident (LTA) mark in October 2006.

Demolition of containment was successfully completed in July. Hydraulic hoe rams were used to break up the structure from the bottom up. 40-foot wide pillars were created and then weakened one at a time to allow the containment to settle down on itself until the dome could be reached by the hoe rams. The process took approximately four months.

Integrated Site Closure activities continue to focus on groundwater characterization and monitoring, final status survey (FSS) of miscellaneous land areas, and RCRA Corrective Action Program implementations. Two groundwater monitoring wells were installed offsite to complement onsite groundwater monitoring activities. FSS field activities are scheduled to be completed in early 2007.

License termination is expected in the summer of 2007. Approximately 30 acres will remain under NRC license. A new administration building will be constructed near the ISFSI to support long-term fuel storage activities.

The Connecticut Yankee Community Decommissioning Advisory Committee will transition to a fuel storage monitoring committee in 2007 with meetings scheduled in the spring and fall.

Containment dismantlement – June 21, 2006

Aerial view of the Connecticut Yankee site – August 9, 2006

FERMI I ..... Contributed By: Lynne Goodman [goodmanl@dteenergy.com]

The Fermi 1 Decommissioning Project continues to make slow, but safe, progress. Recent efforts involve removing components from on top of the reactor and some components from inside the reactor that interfere with removal of the rotating plug graphite block layers. The control rod extensions will be the next components removed. Mockups and practices have been performed. An enclosure is being built around the reactor in preparation for the graphite block removal. Efforts are complicated by the sodium residues remaining in the vessel and possibly trapped inside components. The graphite blocks need to be removed to process the remaining sodium residues inside the reactor vessel.

Fermi 1 Reactor (above).
Removal of control rod extension (right).

LaCrosse ..... Contributed By: Roger Christians [rec@dairynet.com]

The LaCrosse Boiling Water Reactor has begun the process of removing the Reactor Vessel for packaging and shipping to the Barnwell disposal site, before it closes. Because the Spent Fuel Pool is still full, and is located directly adjacent to the Reactor Vessel, the process is more complicated. The plans include grouting the entire vessel (completed in March of 2006), cutting away enough of the biological shield around the Reactor to allow it to move out laterally, cutting a large enough hole in the side of the Reactor Building for the vessel removal, erecting a large gantry crane, packaging the vessel in a separate container, grouting that container, heavy hauling to the rail spur on the site and shipping.

Another part of the project was to package all remaining class “B” and “C” material and ship it to Barnwell. This was completed in July of 2006. This will leave only Class “A” material on site (other than the fuel on the ISFSI pad) after the Reactor Vessel is gone and the spent fuel is packaged, and allow for the complete decommissioning of the site without a “Greater than Class C” issue.

Ongoing activities at this time include the cutting of the hole in the Reactor Building, using a diamond wire saw technique. A bi-fold roll-up door will be installed when the hole is completed in the fall of 2006. The cutting of the biological shield wall will follow, during the winter months. The large gantry crane, which will communicate from outside the building to the inside to lift the vessel, will be installed in March of 2007 and the actual lift will be performed in the April to May time frame. Final grouting and transport to the rail spur will be done in May, with shipment in early June 2007.

Drilling rigging holes in the Reactor Building

Reactor Building siding removal

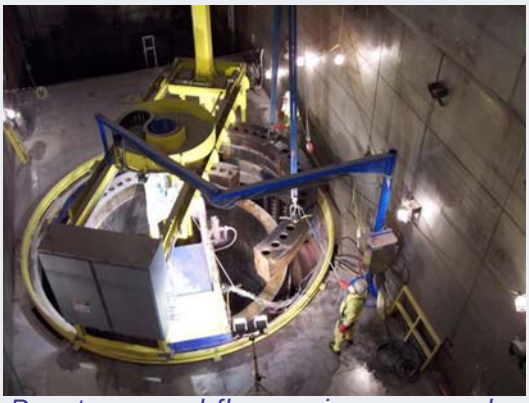
Insulation ring cutting

RANCHO SECO ..... Contributed By: John Newey [JNewey@smud.org]

Recent key decommissioning activities conducted at the Rancho Seco site have included the following operations:

VESSEL INTERNALS - Mechanical cutting and milling (and brute force) have been used to remove internals underwater. Internals cutting and packaging was completed in the spring. Draining of cavity water and vacuuming of the reactor cavity was completed in June.

REACTOR VESSEL –The vessel is currently being segmented for packaging and disposal. The method used is robotically controlled high-pressure water/grit cutting (not underwater). All pieces except beltline pieces will be shipped in sealand containers. The six beltline pieces will be placed in two boxes and grouted, then shipped by rail to Energy*Solutions* in Utah. No DOT exemptions are needed for the shipment. Cutting is expected to be completed in January 2007.



Reactor vessel flange piece removal.

CONTAINMENT BUILDING – Disposition of the concrete in the reactor building is currently under study. Negotiation with demolition and disposal bidders is underway. Self-performance and partial removal as an alternative is under review.

EMBEDDED PIPE –Cleaning of embedded drainpipe in the Auxiliary Building is near complete using a grit blast system that vacuums the debris and grit out the end of the pipe. Work is also complete in the reactor building. Piping remains to be cleaned in the spent fuel building and the turbine building.

OUTSIDE COMPONENTS – All of the contaminated underground pipe has been removed except for the liquid effluent line that will be removed in 2007 with the effluent basins.

LICENSE TERMINATION PLAN – The LTP was submitted in April. Requests for Additional Information (RAIs) were received in October with responses to be submitted soon. The LTP Public Meeting is scheduled for November 14, 2006. DCGLs have been determined using the industrial worker scenario due to the ongoing use planned for the site.

AUXILIARY BUILDING – Room decontamination is in progress and is expected to continue for the next year.

FINAL STATUS SURVEYS – Final Status Surveys are in progress based on methodology submitted in the LTP. While this work is “at risk” until approval of the LTP, only low risk activities (Class 3 outer buildings and land areas) will be performed initially.

SCHEDULE – All current decommissioning activities are expected to be completed by the end of 2008. At that time a partial release of the site from the 10 CFR 50 license is expected. The remaining portion (the waste storage building) will be completed once waste disposal is complete. The ISFSI is under a Part 72 License and will remain until DOE takes the fuel. No date for final release has been determined.

SONGS I ..... Contributed By: Peter Rahme [Peter.T.Rahme@sce.com]

Now, into its seventh year of decommissioning, San Onofre Nuclear Generating Station Unit 1 (SONGS 1) decommissioning project is nearing completion as the remaining standing structures are brought down by hydraulic pounding and torch cutting. Structures that remain include the containment sphere, a portion of the sphere enclosure building wall, the spent fuel building with the pool liner removed, and the radwaste building empty of all equipment. Since the spring of 2006, the project has focused its efforts to crushing, loading, and shipping debris from inside containment. 112 million pounds of demolition debris have been removed and shipped since the start of the project using various means including lift liners (synthetic bags) and intermodals that are shipped to a burial site utilizing both rail and truck vehicles. To date, Phase I of the project is approximately 68% complete and is forecast to complete in 2008. The remainder of the project will be completed concurrent with the decommissioning of the other two operating units many years into the future.

Of interest during the demolition of containment, water was discovered between the containment steel shell and the supporting concrete cradle. This raised the concern that this water could possibly float the containment sphere as debris was being removed from containment causing buoyancy. The project took immediate action to install anti-rotation outriggers and anti-floatation bolts to secure the shell to the cradle as a plan was developed to place dewatering wells around containment and remove water from between the sphere and foundation. Flotation was evaluated at the beginning of the project in 1999 but was not considered a potential concern due to the containment sphere/foundation design assumptions.

Short-Term Forecast

Key decommissioning activities include dismantling the containment sphere, removing the fuel storage and radwaste buildings to approximately 12 feet below grade. The project expects to ship another 70 million pounds of materials from the site by the end of 2008.

Independent Spent Fuel Storage Installation (ISFSI)

The first pad of the SONGS Independent Spent Fuel Storage Installation contains 31 Advanced Horizontal Storage Modules (AHSM). Eighteen AHSMs have been used to store SONGS 1 fuel assemblies and SONGS 1 GTCC waste. Beginning in 2007, the remaining 13 modules will be used to store fuel assemblies from the two SONGS operating units.

Looking Ahead

During the next twelve months, the project will focus on completing the following decommissioning activities:

- Removing the Radwaste Building
- Dismantling the Unit 1 spent fuel building
- Clearing the area for the second ISFSI pad

Excavators inside SONGS reactor building containment hammering concrete rubble near the bottom of the steel liner as this work is nearing completion.

Crushed concrete area and torch cutting of rebar at SONGS to resize material to fit into intermodal and/or lift-liner containers.

Completion of Decommissioning & Site Closure

Physical decommissioning of the former Yankee Rower nuclear plant was successfully completed in September 2006. Decommissioning waste shipments were also completed in September. Demobilization of equipment and trailers is nearing completion and the majority of the site has been graded and seeded. The remainder of the site grading, seeding and stabilization will be completed before the end of the year. Major remaining work includes the completion of the extension of an adjacent dam onto the Yankee property and installation of a modular ISFSI administration building to support long-term fuel storage operations.

All Final Status Survey (FSS) field activities were completed in September. Development and submittal of FSS reports is scheduled to be completed in December. Yankee continues to implement groundwater activities in support of site closure, including the installation of additional groundwater monitoring wells, which was completed earlier this year. Groundwater monitoring will continue until the Massachusetts closure criteria is achieved. NRC License termination is projected for the summer of 2007. Approximately one acre will remain under NRC License.

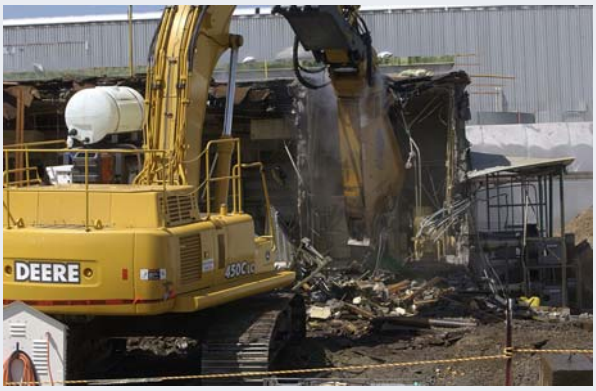
The Yankee Rowe Fuel Storage and Removal Community Advisory Board held their fall meeting in October. The board will continue to meet twice a year focusing primarily on national and regional fuel storage and removal activities.

Views of the Yankee Rowe site after completion of physical decommissioning activities.

DEPARTMENT OF ENERGY

HANFORD SITE ..... Contributed By: Michele Gerber [Michele_S_Gerber@RL.gov]

232-Z Plutonium Incinerator Facility Demolished in Open Air



Demolition of the highly contaminated 232-Z Plutonium Incinerator Facility at the Hanford Site was a highlight of D&D activities completed this past summer.

Fluor Hanford achieved a highly visible success in July when it finished demolishing, removing rubble and stabilizing the site of an incinerator once used to burn plutonium at the Plutonium Finishing Plant (PFP). The 232-Z Incinerator Facility was demolished in open air, within a strict radiological control boundary, with no contamination spread or incidents. It was the first highly contaminated nuclear facility to be demolished in the 15-acre PFP complex at the Department of Energy's (DOE's) Hanford Site in southeastern Washington state.

The small "scrubber cell" – wet filter section – of the 232-Z Facility previously contained Derived Air Concentration (DAC) values for plutonium more than four times higher than those found in the most radioactively contaminated buildings previously demolished in the United States. (A DAC is a measure of radioactivity in air established to determine the risk factors for exposure to an individual and the type of protective clothing and equipment required for access.) Fluor crews finished cleaning out the scrubber cell in February.

Although demolition of the 232-Z Facility was essentially complete by late June, crews spent another five weeks carefully loading debris and rubble into waste containers. In total they removed about 400 cubic yards of debris – nearly 500 tons. The waste was shipped to the Environmental Restoration Disposal Facility (ERDF) – the onsite repository for cleanup waste at Hanford.

Demolishing the 232-Z Incinerator facility completed a milestone more than two months before the stipulated date in the Hanford Federal Facility Agreement and Consent Order (also known as the Tri-Party Agreement or the TPA – the federal/state agreement that governs Site cleanup).

The open-air demolition technique used at the 232-Z Incinerator Facility has been successfully deployed by Fluor Hanford before, when Fluor D&D workers razed the 233-S Plutonium Concentration Building in 2003. However, demolishing the 232-Z Facility required yet more innovation, because the building was wedged among three other occupied buildings. In addition, the work was executed within an operating nuclear area. In fact, 232-Z sat close to facilities storing some of PFP's special nuclear materials, necessitating close supervision of the work by security guards to maintain safe storage of the materials.

Extensive air-modeling done at and near the 232-Z site before demolition helped identify a closely marked and supervised set of radiological zones and boundaries. Continuous air monitors and fixed-head air samplers installed at the site monitored air conditions in real time.

During the demolition a defense-in-depth philosophy was adopted to prevent contamination from spreading, and applied fixatives, misters, a large fog cannon, and a water stream were used during tasks that involved the most contaminated or dusty conditions.

False metal walls were also installed between the 232-Z Facility and nearby buildings. Surrounding facilities were shrouded in plastic sheeting weighted down by industrial magnets to protect them from potential radioactive dust. Other protective measures included installing sump pumps, sand berms and absorbent pillows known as "pigs" to control water runoff and hold it close to the demolition site.

The next phase of the work – loading the demolition debris and rubble into large ERDF containers and removing it –was also a carefully controlled process. After the rubble was removed, the 232-Z concrete slab was sprayed with a long-term fixative and covered with more than 18-inches of clean gravel, then

carefully surveyed and marked.

Current milestones in the Tri-Party Agreement call for the PFP complex to be razed to “clean slab-on-grade” status by 2016. In the near term, the 241-Z Liquid Waste Treatment Facility will be demolished in 2007, with cleanout of equipment from contaminated gloveboxes in the main PFP Building – the 234-5Z Facility – ongoing. Fluor Hanford also demolished five smaller ancillary structures in the PFP complex during 2006.

Major Progress at K Basins

The past six months also brought major milestones in cleaning out Hanford’s K Basins -- two indoor concrete pools of approximately 1.3-million gallons each. The basins became highly contaminated with sludge after irradiated uranium fuel was stored underwater in them for approximately 30 years. Fluor Hanford completed removing and drying the fuel in 2004.

In October, Fluor workers completed the two-year job of containerizing the bulk of the sludge in the K East Basin. The KE Basin contained the majority of the sludge -- a highly radioactive combination of dirt, sand, rust, chemicals, fuel corrosion products, and decay or fission products. Although early estimates placed the sludge volume in the K Basins at about 55 cubic yards, the actual volume was about 46 cubic yards.

Fluor Hanford completed containerizing bulk sludge in the KE Basin in the Fall of 2006.

Containerizing the sludge was compared to “chasing smoke.” Workers stood on grates suspended above the 20-foot-deep basin and manipulated vacuuming equipment at the end of long poles—while using underwater cameras and lights to guide their work. Despite some improvements, the water was never really clear, and often, workers could not see the bottom of the basin.

Unexpectedly large amounts of debris in the basin water also slowed progress. The debris encumbered and slowed the pumping work, and sometimes made sludge inaccessible. Workers alternated between vacuuming radioactive sludge and removing contaminated debris from the basin. In total, they removed about 150 tons of debris and fuel racks from the K East Basin during the two years of vacuuming.

In addition, sludge characteristics varied widely. In some places, the sludge was sticky and cake-like, but in other places, it was swirling and flaky. Settling the flighty sludge became a significant problem, as it often billowed back and clouded the water as it was being transferred into the containers. Several worker innovations, including a sludge settling apparatus called the “SCOOPS” (Sludge Containerization Overflow Pumping System) – installed at the top of each container – helped to address this problem.

Workers also devised new “end effectors” to fit onto the ends of the pumping hoses. Different shapes accomplished work in different conditions.

Also in October, the sludge collected in underwater tanks began moving out of the K East Basin through a new hose-in-hose (HIH) transfer system. The sludge was pumped to a waiting underwater container in the K West Basin. The HIH system was developed to allow the K East Basin to be emptied of its primary radiological inventory and prepared for demolition first, because it is the more contaminated and leak-prone of the two K Basins.

The HIH system uses first-of-a-kind transfer technology, although its design was built upon previous experience with transferring dense, radioactive slurries in Hanford’s tank farms. The steel-reinforced rubber hose has a deliberately small inner diameter, designed to maintain high velocity to keep sludge particles in suspension during the transfers.

Transferring the sludge from three other underwater containers in the KE Basin is expected to be completed this coming winter. The transfers will be scheduled around operation of the K West Basin sludge collection system, which is due to begin in November.

Other Hanford Progress

Fluor Hanford marked other successes in the past six months, including finishing its tenth year as prime contractor to the DOE's Richland Operations Office at Hanford. In September, Fluor's contract at Hanford was extended for up to another two years, carrying it forward to September 2008.

The company retrieved approximately 5,000 drum-equivalents of buried solid waste suspected of being transuranic (TRU), and made approximately 50 shipments of TRU waste from the Hanford Site to the DOE's Waste Isolation Pilot Plant.

Fluor Hanford also injected two test wells in the Site's 100-N Area with a new chemical compound designed to trap strontium-90 before it travels from contaminated soil into the Columbia River. Further injections are planned very soon, after the initial data is evaluated.

Crews at the Fast Flux Test Facility (FFTF) completed draining liquid metal sodium coolant from all of the large sodium vessels in the facility, making a total of 260,000 gallons drained since D&D activities began. Several ancillary reactor systems also were shut down.

In September, Fluor Hanford reached the milestone of demolishing over 100 buildings at Hanford in the past three years. This past summer, seven more buildings were cleaned out and turned over to demolition crews.

NEVADA TEST SITE ..... Contributed By: Jerel Nelson [jnelson@polestar.com]

Introduction

The decontamination and decommissioning (D&D) of legacy nuclear rocket facilities are being performed at the Nevada Test Site (NTS) Beginning in 2002, with the decommissioning and demolition of the Reactor Maintenance Assembly and Disassembly (R-MAD) Decontamination Facility, the remaining facilities are being decommissioned using the Streamlined Approach For Environmental Restoration (SAFER) approach under the Federal Facilities Agreement and Consent Order (FFACO) regulatory process.

History

The U.S. Atomic Energy Commission (AEC), predecessor to the U.S. Department of Energy (DOE), began to develop nuclear rocket engines in 1955. In 1956 the AEC designated 127,200 hectares (318,000 acres) in Area 25 (then called Area 400) as Project Rover. The AEC and the National Aeronautics and Space Administration (NASA) organized the Space Nuclear Propulsion Office to administer the development of an operational nuclear-powered rocket for space travel.

Reactor testing at Test Cell A Facility.

The larger R-MAD, Test Cell A (TCA), Test Cell C (TCC), and the Engine Maintenance Assembly and Disassembly (EMAD) facilities were constructed and utilized for the Nuclear Rocket Development Station Program (NRDS). Additional facilities, Pluto Building and Super Kukla facility, were constructed for development of a nuclear engine and to further reactor research, respectively.

From 1959 to 1966, the Kiwi, Nerva, and Phoebus reactors were tested at these facilities. These experimental reactors were operated by fission of highly enriched uranium 235 (U-235). The energy created by the fission of U-235 was absorbed by pumping liquid hydrogen gas through the reactor where it was heated to 2,400º Celsius (4,000º Fahrenheit). The heated hydrogen was then exhausted through a nozzle at very high velocities to produce thrust. After exiting the nozzle, the hydrogen gas

was ignited, producing water vapor. The reactors were mounted on railcars and fired upward. Test runs ranged from several seconds to about one hour.

Testing resulted in the facilities being radiologically-contaminated with fission products and fuel particles. Most of the contamination consisted of isotopes with relatively short half-lives which have since decayed away. The remaining isotopes of primary concern include cobalt 60 (Co-60), cesium 137 (Cs-137), and strontium 90 (Sr-90). Additional isotopes that may be present in lesser abundance include uranium 234 (U-234), U-235, U-236, U-238, plutonium 239 (Pu-239), and Pu-240.

The facilities were partially deactivated in the mid- to late-1960s and placed into long-term mothball status in the early 1970s. With the surveillance and maintenance (S&M) program initiated in 1997, ongoing monitoring and maintenance of these facilities have been performed annually.

Regulatory Framework

Contaminated facilities are decommissioned under the FFACO process, which is a tri-partide agreement between the State of Nevada – Nevada Division of Environmental Protection, the U.S. DOE, and the U.S. Department of Defense (DOD).

Facilities are closed using the Streamlined Approach For Environmental Restoration (SAFER) process. Use of the SAFER concept allows technical decisions to be made by an experienced decision-maker within the conceptual site model. Uncertainties are addressed by documented assumptions verified by sampling and analysis, data evaluation, and onsite observations of planned activities. The SAFER process allows closure activities to be accelerated, and the characterization and remediation activities to proceed simultaneously, as long as the information developed is consistent with the DQO conceptual model.

RMAD Facility

The RMAD facility located in Area 25 was constructed between 1958 and 1961 RMAD, is approximately 4,550 square meters (m^2) (49,000 square feet [ft^2]), and consists of a basement and four floors, and 80 rooms, including two assembly bays, a disassembly bay, a control room, seven postmortem cells, and other rooms.

The facility was used to assemble and disassemble reactor rocket test beds. Reactor sections were transferred to the smaller postmortem hot cells for detailed inspection and dissection. Fuel associated with the reactor was removed and subsequently transferred to the Idaho National Engineering and Environmental Laboratory in 1975 for reprocessing.

Area 25 RMAD Facility.

The RMAD Building was placed into long-term mothball status in 1970. The facility was partially deactivated in 1973, extensive decontamination activities were conducted. Accessible areas of RMAD were completely deactivated and decontaminated in 2003. A radiologically clean section of the structure was demolished in 2005 and remaining portions of the structure are awaiting final demolition.

RMAD Decontamination Facility

The RMAD Decontamination Facility was used to perform radiological decontamination of nuclear rocket test-car hardware and tooling in the 1960s and 1970s. The facility contained contaminated soil and building materials. It consisted of a corrugated metal building and two decontamination pads.

The facility contained asbestos, polychlorinated biphenyls (PCBs), chromium, lead, cadmium, arsenic, acetone, benzene, and other EPA F-listed wastes within the facility structure. Hazardous materials, chemicals, and radiological contamination were removed from the facility, concrete pad, and soil. The facility was demolished in 2001. Lessons learned were applied to the RMAD D&D Project.

Test Cell A (TCA) Facility

The TCA facility was used to test various types of nuclear reactors (Kiwi A and B, Phoebus A and B, and Pewee) between July 1959 and September 1969.

TCA is a two-story building constructed in 1958 of reinforced concrete. The main Building 3113 is approximately 108 m^2 (1,200 ft^2) consisting of an instrument room and mechanical rooms. The second level, approximately 57 m^2 (634 ft^2) consists of a penthouse room and a neutronics room. The test article was controlled from the nearby reactor control point (RCP).

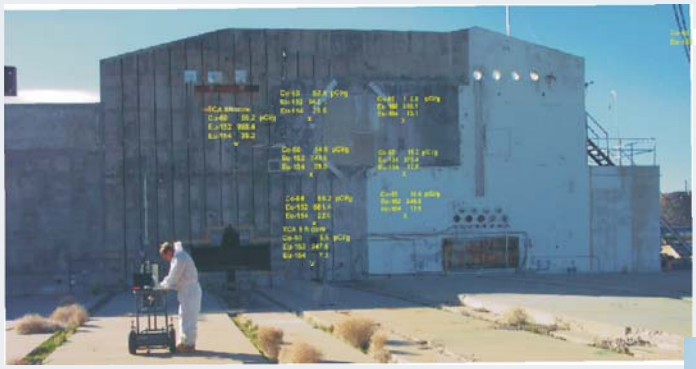
A concrete reactor pad of 277 m^2 (3,078 ft^2), where the nuclear engines were fired, was built during the construction of Building 3113. Railroad tracks were built into the reactor pad so that the test car could be remotely driven from the RMAD Facility to the test location. A movable shed sheltered the reactor from the weather.

During the Kiwi-A test in 1962, there was leakage from the high-pressure valves at the associated Tank Farm that led to a surge of hydrogen gas through the reactor, causing an explosion. Approximately 7.2 hectares (18 acres) of land surrounding the test stand were contaminated with fission products. The size of the ejected material ranged from large and identifiable to microscopic pieces. Approximately 780 m (2,600 feet) of hard-surface roads were decontaminated with high-pressure streams of water.

Facility radiological surveys, core drilling, piping/utility verification, and asbestos removal were been performed at the facility. Removal of hazardous materials and equipment and decontamination were completed in April 2005. The structural demolition of the less than 3 feet thick sections of the structure was completed in June 2005.

Test Cell A – Mechanical Demolition

The controlled explosive demolition (CED) of the radiologically-activated 5 foot 5 inch thick reinforced concrete shield wall was completed in July 2005.



Shield wall prior to controlled explosive demolition.

Shield wall during controlled explosive demolition.

Test Cell C (TCC) Facility

TCC was used to conduct ground tests and static firing of nuclear engine reactors, engine staging, as well as for qualification tests of components in cryogenic and nuclear environments. Reactors were assembled in either the RMAD or the EMAD Facilities and shipped remotely to the test cell via railroad system. The building contains maze-like piping systems, required to handle numerous gases and liquids used during the reactor tests.

Numerous nuclear tests were conducted at TCC including tests related to the Kiwi, Phoebus, NRX, Peewee, and NF series. The Transient Nuclear Test took place at TCC in January 1965.

A reactor accident occurred during the final test of Phoebus 1-A on June 25, 1965. During the shutting down phase of the test, momentary coolant stoppage occurred. At that moment, structural damage sustained by the core of the reactor caused pieces of fuel to be ejected up to 180 m (600 ft) from the reactor, thus contaminating most of the TCC Facility including Building 3210.

Area 25 Test Cell C Facility.

TCC consists of Buildings 3210 and 3211, a concrete shielding wall, a concrete reactor pad, and the nuclear furnace piping. The facility was built in 1961 and operated until 1973. It is constructed of 30.5-centimeter and 50.8-centimeter (12-inch and 20-inch) thick reinforced concrete walls and roof.

Building 3210 is 1,116 m^2 (12,400 ft^2) in size and consists of a basement, a ground floor, two second-level rooms, and an elevator shaft. Most of the buildings at the TCC Facility are located on a 4,494 m^2 (49,931 ft^2) concrete pad. The concrete shield wall, approximately 18 m (60 ft) high, north of Building 3210 provided protection from the radioactivity produced by the reactor tests that were conducted on the reactor pad behind the building.

Planning and investigative activities for the decommissioning of Test Cell C are in progress. D&D is scheduled to be completed in FY08.

EMAD Facility

The EMAD Facility was constructed in 1962 and was designed and used for the assembly and preparation of nuclear engines for testing, the refurbishment of radioactive engines, and the disassembly and detailed post-mortem inspection of tested engines and components. Over three times the size of the RMAD Building, EMAD's greater height and space were needed to handle the huge Nerva engine.

The facility was used for Project Rover until approximately 1972. In 1978, the Fuel Demonstration Project set up operations at the facility. Fuel assemblies were removed from the site in 1989, and the facility has been inactive since 1987. Annual S&M activities maintain the facility in its current state. It is one of the most popular stops for facility tours at the NTS. D&D of EMAD is currently scheduled to begin in 2012.

The EMAD Facility is a large T-plan, multi-story, reinforced concrete structure divided into seven separate areas based on function and material flow. These areas are the cold assembly bay, a hot maintenance and disassembly bay, post-mortem cells, high- and low-level cells, operating galleries, a shop and service area, and administrative areas.

The cold assembly bay was designed for receiving and assembling engines. The hot maintenance and disassembly area includes a main hot bay, 20.1 m (66 ft) wide by 44.5 m (146 ft) long and 22.5 m (77 ft) high, surrounded by 1.5- and 1.6-m (5- and 6-ft) thick concrete walls for shielding, a crane maintenance balcony, core and engine disassembly cells, and a hot hold and transfer tunnel.

Pluto Disassembly Facility

Project Pluto was initiated by the U.S. Department of Defense in 1955. The objective of Project Pluto was to develop a unique nuclear reactor, designed to propel a missile through the atmosphere at altitudes ranging from sea level to several miles at a velocity three times the speed of sound.

The Pluto Disassembly Facility - Building 2201 was designed to perform remote adjustment, component replacement, and complete disassembly of the Tory II reactor system. After disassembly operations for the Tory II-A reactor took place in Building 2201, the Fuel Repackaging Operations Project started in 1971 and ended in 1972.

Pluto Disassembly Facility is an 855 m^2 (9,500 ft^2) three-story building with a basement. Disassembly operations were viewed through 1.8-m (6-ft) thick leaded-glass windows immersed in oil to minimize refraction losses. The core was removed from the railcar using remotely operated manipulators. The D&D of Pluto is scheduled for 2007.

Super Kukla Facility

The Super Kukla Facility was constructed in 1964. Super Kukla Reactor Building/High Bay is located in Area 27 of the NTS. Building 5400, the Reactor Building, consists of a pit foundation, a reactor containment room, and an access hall. From 1964 to 1979 the reactor housed in Building 5400 was used to test the effects of “prompt bursts” or intense pulses of radiation over brief periods of time on a wide variety of samples including fissile and other materials. Decontamination activities occurred at the Super Kukla Facility in the Reactor Building, High Bay, and Mechanical Equipment Building in 1979. Super Kukla D&D decommissioning is currently in progress and scheduled for completion in FY08.

Lessons Learned

Facility D&D began with the following challenges:

- Limited written facility process knowledge and engineering drawings of unique experimental facilities and processes used
- Remote locations of the facilities
- Fixed funding levels, requiring innovative strategies
- Craft concern over unknown health and safety risks hazards
- Cost and value of site infrastructure
- Implementation of new work control processes

Faced with these challenges, D&D progressed with a dedicated team, meeting all fee milestones. The D&D team’s determination to succeed overcame the many challenges throughout the projects.

Key lessons learned D&D projects at the NTS have been applied to subsequent facility D&D project, including:

- Performance of selected investigation and characterization activities to assist in determining the D&D strategy, streamlining field activities, and reducing project costs.
- Early identification and removal of the extent and locations of hazardous materials and contaminated areas lead to increased worker safety and initial work.
- Early involvement of all supporting organizations lead to commitment and support during the project.
- Use of experienced subcontractors for selected scopes of work.
- Clear roles, responsibilities, and expectations, including defined scope of work provided clear direction for field personnel to perform the project scope.

As a result, D&D waste streams have been established for all facilities in the area. New and existing technologies have been proven. Aggressive decontamination and demolition techniques are utilized, and communication channels have been established. NTS D&D projects now benefit from an experienced technical and management team and early involvement of supporting organizations

(e.g., Environment, Safety, and Health, Radiological Protection, Waste Management, Construction). Selected preliminary investigation activities performed to develop the D&D strategy and activity planning, proper sequencing of field activities and engineering involvement have proven necessary for safe and successful completion of the closure of the facility.

PORTSMOUTH ..... Contributed By: Sandra Childers [SChilders@lpports.com]

LATA/Parallax Portsmouth Completes Demolition of 13 Inactive Facilities at Portsmouth Plant

In just eight months in 2006, LATA/Parallax Portsmouth LLC has completed the demolition of 13 inactive, surplus facilities at the Portsmouth Gaseous Diffusion Plant in southern Ohio.

Under contract to the U.S. Department of Energy (DOE) to perform environmental remediation work at the plant, located 75 miles south of Columbus, Ohio, the company is required to complete the characterization, decontamination and decommissioning of 14 inactive facilities by the contract's end date of September 2009.

Paul Kreitz, LATA/Parallax's project manager, said the D&D of the surplus facilities will be finished well before the contract is over. "Under our scope of work, we were tasked to complete a project to demolish 14 inactive facilities by September 2009," Kreitz stated. "To date, we have accomplished the removal of all but one of the buildings and we are putting additional resources into dismantling the final structure by early 2007."

The 11,000 square foot X-105 Electronic Maintenance Building was recently demolished in October 2006. The building was constructed in 1957 and had been vacant since 2001.

Several of the buildings were built in the early 1950s during the original construction of the plant, which operated initially to enrich uranium for defense purposes and later for commercial nuclear power reactors until production ended in May 2001.

The first three smaller buildings were dismantled by LATA/Parallax in late February 2006. Nine more structures came down between March and August. The 13th building was completed in October. Preliminary field work has begun on the final structure, which is also the largest. The 22,640-square foot X-770 Mechanical Test Building was constructed in 1954 and operated until 1974. It is expected to be razed by March 2007.

All these facilities were authorized by the Department of Energy to be dismantled because they were no longer needed and could be removed prior to the future D&D of the gaseous diffusion plant buildings to eliminate surveillance and maintenance costs associated with the inactive facilities.

Structures demolished this year included: 1) an environmental monitoring station, 2) environmental storage building, 3) a waste oil storage facility, 4) an old fire training building, 5) liquid effluent control facility, 6) old sewage treatment plant, 7) a neutralization pit, 8) hydrogen fluoride (HF) storage building, 9) gas ventilation stack, 10) HF safety building, 11) water deionization building, 12) maintenance and stores gas manifold shed, and 13) the electronic maintenance building.

"Our workers are doing a tremendous job in removing these old facilities safely and expeditiously," Kreitz added. "CDM, one of our major teaming partners, has been instrumental in dismantling several of these facilities. These efforts speak highly of the dedicated team we have assembled to ensure that our DOE requirements are not only met but exceeded."

Overall, more than 1,093 cubic meters of demolition debris were removed from the site under the project. The waste has been shipped to a licensed off-site disposal facility.

WIPP – A Final Solution for Transuranic Waste

For decades, transuranic (TRU) waste accumulated at former nuclear weapons production facilities. It wasn't until the Department of Energy's Waste Isolation Pilot Plant opened in 1999 that wastes significantly contaminated with plutonium, americium and other TRU elements had a path forward.

Now, nearly eight years in operation, WIPP provides a final solution for more than 43,600 cubic meters of TRU defense waste. The facility's 2,150-foot-deep repository has led to TRU waste cleanup of 13 generator sites, including the 2005 closure of Rocky Flats Environmental Technology Site (RFETS).

Rocky Flats D&D – TRU Collaboration

In 1999, RFETS' TRU waste inventory remained a "long pole" in Rocky Flats' accelerated decontamination and decommissioning (D&D) effort. WIPP's complex requirements for TRU waste characterization and rigorous transportation packaging requirements necessitated a variety of strategies to characterize, certify and ship RFETS' legacy waste inventory and newly generated D&D waste. Rocky Flats waste included over 40 waste streams that included legacy waste, PCB-contaminated waste, hazardous mixed waste and classified waste.

A single RFETS organization was assigned overall responsibility for TRU waste characterization and shipping at Rocky Flats. The group worked closely with the Department of Energy, Carlsbad Field Office and WIPP technical experts to develop strategies that led to RFETS closure one year ahead of schedule and $400 million under budget. Following are but a few of the best practices born of the collaborative effort.

Characterization Solutions

Visual Examination of Waste

The WIPP waste analysis plan (RCRA characterization) required that a statistical portion of all TRU waste streams examined by radiography must undergo visual examination (VE) as an added step to establish the radiography miscertification (accuracy) rate. Opening an average of 16 containers per RFETS waste stream to examine the contents was a laborious process that increased the risk of worker exposure.

WIPP permit specialists sought to modify the WIPP Hazardous Waste Facility Permit waste analysis plan so that the number of containers to be visually examined was based on Summary Category Groups (homogenous solids and debris wastes) rather than on a waste stream basis, thereby minimizing the number of drums to be opened and repackaged. The modification was approved by the New Mexico Environment Department in 2000 and generated cost savings estimated at $18 million.

RFETS also took advantage of a characterization method in the WIPP waste analysis plan that allowed for visual examination of the waste prior to packaging. This strategy, adopted site-wide for newly-generated D&D waste, greatly reduced the number of containers that required radiography.

Headspace Gas Sampling

Another RCRA requirement in the WIPP waste analysis plan was for each waste container to be sampled for headspace gases. Containers were set aside for a prescribed time period until a representative sample of headspace gas could be collected. The drum age criteria, or length of time required before sampling, depended on the layers of confinement inside the container.

RFETS had a large volume of waste that had undergone a high thermal treatment process. The process would have removed volatile organic compounds, if any were present in the waste. WIPP permit specialists developed and received state approval for a permit modification to reduce the number of thermally treated waste containers to be sampled. The result was that approximately 18,000 containers did not require head space gas sampling, with an estimated cost savings of $29 million.

Classified TRU Wastes

Some of RFETS TRU waste was classified for national security reasons. At the time, the WIPP facility did not have the necessary authorizations and safeguards to accept classified wastes. To accommodate RFETS classified inventory, WIPP personnel requested and received approval for a modification to the waste analysis plan to characterize classified waste and instituted the necessary safeguards for its management.

Packaging and Shipping Solutions

Flammable Gas Generation

Radioactive material in contact with hydrogen bearing material is known to generate hydrogen gas by radiolysis. Shipment of waste in the TRUPACT-II requires assurance that a flammable gas mixture does not occur within the sealed TRUPACT-II during shipment. This is controlled by assignment of shipping categories to payload containers and through wattage restrictions imposed on each payload container for the majority of the waste shipped in the TRUPACT-II. Containers that do not exceed their wattage limit will not generate significant hydrogen gas over the shipping period when shipped with other containers in the same shipping category that also do not exceed the wattage limit.

Wattage limits restrict the ability to ship combustible or organic type waste that may readily generate hydrogen gas by radiolysis. Wattage limits are primarily based on the gas generation potential of the waste material and the resistance to release of hydrogen that is generated from the waste.

By explanation, the higher the gas generation potential, the lower the wattage limit. The higher the resistance to the hydrogen release, the lower the wattage limit. Both gas generation potential and the resistance to hydrogen release can be influenced by the packaging configuration of the waste, and thus affect the wattage limit assigned to the payload container. RFETS adopted a variety of packaging configurations to meet shipping compliance.

For example, RFETS used filtered bags or filtered layers of confinement to reduce resistance to hydrogen release, leading to an increase in the wattage limit for a given waste material. RFETS also used direct waste loading into metal cans (of benefit with metal debris waste) that has a lower gas generation potential than that of plastic packaging. By preventing the alpha radiation emitted from the radioactive waste material from interacting with plastic confinement bags, the configuration has the effect of lowering the gas generation potential of the waste, and thus increasing the wattage limit.

RFETS developed a very specific and proceduralized system for generating and packaging waste that controlled gas generating payloads and assured wattage limits were not exceeded for transport.

Pu-239 Loading Limits

Payload containers may be shipped to WIPP in the TRUPACT-II only if the measured Pu-239 fissile gram equivalent (plus two times the measurement error) is 200 or less for a 55-gallon drum or pipe over-pack component (POC). The Pu-239 FGE limit for a standard waste box and a ten-drum over-pack is 325 or less. The Pu-239 FGE limit for each TRUPACT-II is 325, unless the payload consists of 14 POCs, in which case the limit is 2,800 (14 times 200).

In order to meet FGE limits, it would take 14 TRUPACT-IIs to ship fourteen 55-gallon drums each containing 200 FGE. By contrast, 14 POCs containing 200 FGE could be shipped in just one TRUPACT-II. RFETS made use of the more efficient POCs for wastes contaminated with high levels of plutonium. RFETS also utilized standard waste boxes to over-pack individual 55-gallon drums that assayed more than 200 but less than 325 FGE to minimize drum repackaging.

The five-year collaboration between WIPP and RFETS ended April 19, 2005, with the last of 15,000 cubic meters of TRU waste shipped to WIPP. At the time, Deputy Secretary of Energy Clay Sell said that Rocky Flats' 10-year, $7 billion D&D project was "a great inspiration to other Department of Energy sites working toward cleanup." WIPP's focus on safety, spirit of innovation and unique underground repository continue to be the path forward for TRU waste cleanup of these sites.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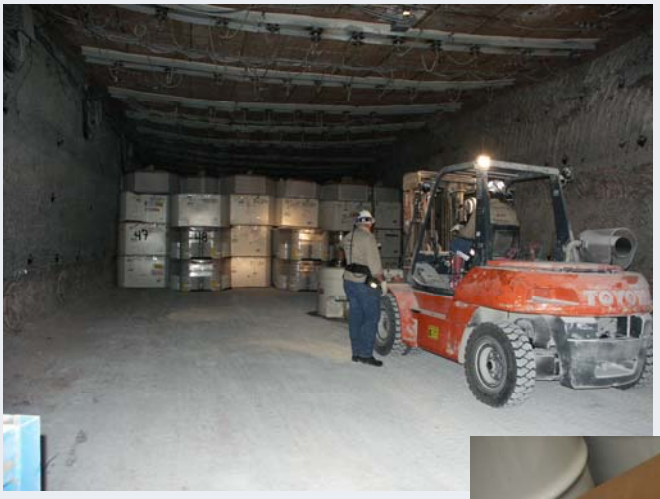
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Nuclear Power Decommissioning in Japan

As for safety regulation on nuclear power plant decommissioning, the Laws Concerning the Regulation of Nuclear Materials, Nuclear Fuels, and Reactors (Law No. 1) was amended during a session in 2005, thereafter the Law for Establishment and Operation of Nuclear Power Generating Reactor was rearranged to legislate substantial requirements for safe decommissioning works. Under these regulatory frameworks, a major feature of the amendments is that the decommissioning plan came to a matter of permit instead of notification of dismantling plan. Therefore each decommissioning licensee needs to submit a decommissioning plan before starting its decommissioning.

Tokai

Subsequently to JPDR (Japan Power Demonstration Reactor) decommissioning ended in 1996, the first commercial nuclear plant, Tokai, started decommissioning in December 2001. Fugen shut down permanently in March 2001 preparing decommissioning activities. Now there are 12 plants that have more than 30 years in operation.

The Japan Atomic Power Company (JAPC) shutdown Tokai (GCR, 166MWe at the end of March in 1998. During GCR decommissioning, the law was amended therefore JAPC submitted the Tokai decommissioning plan and received its permit in June 2006. The decommissioning project was planned to be long term (17years in all), and is divided into three phases.

JAPC's strategy on Tokai decommissioning project is to continuously dismantle the plant through three phases and the land will be a green field for future nuclear power generation. The reactor area, i.e. reactor and biological shield envelope, will be in safe storage condition for 10 years to reduce radioactivity.

Prior to the reactor dismantling, conventional facilities outside the reactor area are removed for securing a transportation route for reactor dismantling wastes, and also securing the space for new waste conditioning facilities. These conventional facilities removal work would balance the workload through the 17 years decommissioning project.

The First Phase was 5 years from 2001 to 2005. The first activity was to prepare for the reactor safe-store; i.e. all primary loop's valves connecting to the reactor were closed in December 2001. Then 2.7 kilo ton of the CCP Cartridge Cooling Pond Water was drained subsequent to the removal of underwater equipment such as spent fuel storage racks in 2002. Turbine Generator and associated equipment were removed in 2003. Reactor Auxiliary Equipment in Reactor Service Building, Fuel Handling Building and Fuel Charge Machines were removed and decontaminated in 2004 and 2005. The modification of electrical power supply facility and re-cabling work for the existing equipment followed. Almost all these first phase works were implemented by JAPC personnel. They refer to it as "do it ourselves policy".

Relatively small scale works are done in the first phase and medium scale works are done in the second phase. Large scale works will be done in the final third phase utilizing knowledge, technologies and experiences accumulated in the previous phase periods.

In the next step of decommissioning from 2006 to 2010, four Steam Raising Units and primary gas duct outside will be dismantled with control of inner contamination.

Fugen

JAEA (Japan Atomic Energy Agency) permanently shut down Fugen, a prototype of an advanced thermal reactor (heavy water moderated, light-water cooled and pressure tube type, 165 MWe), at the end of March in 2003 after 24 years operation since 1979. For preparation of decommissioning after shutdown, several work phases have been implemented.

All of the spent fuel rods were removed from the reactor, and then stored in the fuel storage pool in 2003. The stored fuels are continually being transported to the Tokai works for reprocessing.

Heavy water used as moderator has been withdrawn from the system. The heavy water is preprocessed to eliminate Co-60 with a gamma nuclide elimination technology developed by Fugen NPS. After the treatment, the processed heavy water is encapsulated in shipping casks for transportation to Canada. This process and the transportation is now underway.

In order to reduce exposure dose during the maintenance and dismantling process, the primary coolant loops were chemically decontaminated in 2005.

In November 2006, the decommissioning plan was submitted to the Nuclear and Industrial Safety Agency (NISA) of the Ministry of Economy, Trade and Industry (METI), which is the regulatory authority. After obtaining permission from the Ministry, Fugen will start decommissioning.

Spent fuel storage rack cleaning at Tokai.

Removal of low pressure turbine at Tokai.

Heavy water retrieval work at Fugen.