

American Nuclear Society

ANS Topical Meeting on Decommissioning, Decontamination and Reutilization

DD&R 2007

September 16-19, 2007
Chattanooga, Tennessee, USA

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 978-1-60423-943-0

Some format issues inherent in the e-media version may also appear in this print version.

TABLE OF CONTENTS

MONDAY, SEPTEMBER 17, 2007 • 1:00 P.M.

International Projects—I. Session Cochairs: *Randall Ridgeway (AECL), Eric Gouhier (CEA)*

Challenges for Lithuania: Ignalina NPP Early Closure.....1
Birute Teskeviciene (Ministry of Economy of the Republic of Lithuania), Peter Harrison (Central Project Management Agency)

Development and Implementation of a Comprehensive Program to Deal with Canada's Nuclear Legacy Liabilities4
Peter Brown, Douglas Metcalfe, Marcia Blanchette (Natural Resources Canada), George Dolinar, Steven Halpenny, Chris Purdy, David Smith, William Kupferschmidt (AECL)

Decommissioning Plan of the Musashi Reactor and Its Progress.....7
Tomio Tanzawa (Musashi Inst of Technol)

Commercial Projects. Session Cochairs: Carl Mazzola (Shaw), Art Paynter (Afrancis LLC)

Dry Cask Storage Experience for a One-of-a-Kind Decommissioning Project9
Robert Lehnert (Energy Solutions), William Trubilowicz (Operating Solutions of Michigan)

Cleanout and Reuse of GCEP Facilities at Portsmouth12
William Franz, Mark Hickman (LATA), Kristi Wiehle (DOE)

Money Related Decommissioning and Funding Decision Making15
Lynne S. Goodman (Detroit Edison)

SAFSTOR and License Renewal: Making Them Coexist18
William Henries (TLG Svc)

Segmentation and Removal of the Carolinas-Virginia Tube Reactor (CVTR) Moderator Tank.....21
Michael G. Anderson (MOTA Corp)

N.S. SAVANNAH Reactor Vessel Metal Extraction and Radiochemical Analysis25
Richard Ranellone (Mega-Tech, LLC), John Wiegand (U.S. Dept of Transportation), John W. Bowen, Jon Stouky (Mega-Tech Svc)

Radioactive Waste Management. Session Cochairs: Sue Aggarwal (New Millennium Nuclear Technol), Robert Hiegersell (SRNL)

Disposal of Deionizer Vessels Highly Contaminated with ¹⁴Carbon at SRS	31
Robert A. Hiergesell, Daniel I. Kaplan (SRNL)	
An Assessment of Using Vibrational Compaction of Calcined HLW&LLW in DWPF Canisters.....	34
You-Bo Yi, Robert C. Amme, Zeev Shayer (Univ of Denver)	
Concrete Waste Recycling Process for High Quality Aggregate	39
Takeshi Ishikura, Shin-ichi Fujii (NUPEC)	
Historical Waste Retrieval and Clean-Up Operations at Nuclear Facility #56, at the CADARACHE Nuclear Research Centre	42
C. Santucci (CEA)	
Alternatives to the Burial of Low-Level Radioactive Waste	45
J. Mark Price (SCE)	
Melting of the Metallic Wastes Generated by Dismantling Retired Nuclear Research Facilities	49
Chong-Hun Jung, Pyung-Seob Song, Byung-Youn Min, Wang Kyu Choi, (KAERI)	

MONDAY, SEPTEMBER 17, 2007 • 4:00 P.M.

Poster Session

Experience of Hot Cell Renovation Work in CPF (Chemical Processing Facility)	51
Toyonobu Nabemoto, Fujio Katahira, Tadatsugu Sakaya (IHI Corp), Shinichi Aose, Takafumi Kitajima, Kouji Ogasawara, Kazunori Nomura, Shigehiko Miyachi, Yoshiaki Ichige, Tadahiro Shinozaki, Shinichi Ohuchi (JAEA)	
Renovation of CPF (Chemical Processing Facility) for Development of Advanced Fast Reactor Fuel Cycle System.....	54
Shinichi Aose, Takafumi Kitajima, Kouji Ogasawara, Kazunori Nomura, Shigehiko Miyachi, Yoshiaki Ichige, Tadahiro Shinozaki, Shinichi Ohuchi	
Web-Enabled Analysis of a Large-Scale Deactivation and Decommissioning Program.....	57
James S. Bollinger, William E. Austin (SRNL)	
U.S. EPA Superfund Program's Policy for Risk and Dose Assessment	59
Stuart Walker (EPA), invited	

Detroit Edison’s Fermi 1—Preparation for Reactor Removal	62
Danny Swindle (Sargent & Lundy)	
Case Studies on Facility Characterization with X-Ray Fluorescence Spectrometry	66
K. T. Kirk, R. D. Brooksbank, J. M. Meszaros, W. E. Towery (Bechtel Jacobs)	
Financial Planning as a Tool for Efficient and Timely Decommissioning of Nuclear Research Facilities	70
Anna Cato, Staffan Lindskog (SNPI), Rolf Sjöblom (Tekedo AB)	
Low Level Radioactive Wastes Conditioning during Decommissioning of Slaspils Research Reactor	74
G. Abramenkova (Univ of Latvia), A. Abramenkovs (Hazardous Wastes Management State Agency), M. Klavins (Univ of Latvia)	
PHENIX Power Plant Decommissioning Project—Treatment of the Primary Cold Trap	77
M. Deluge (CEA)	
Phenix Power Plant Decommissioning Project—Removal of Core and Neutron Blanket Components	80
C. Moitrier (CEA)	
Risk-Quantified Decision-Making at Rocky Flats	83
Jeffrey C. Meyers (Washington SMS)	
Automated Inadvertent Intruder Application	86
Larry D. Koffman, Patricia L. Lee, James R. Cook, Elmer L. Wilhite (SRNL)	
Using the Conceptual Site Model to Remediate Two Sites in New England and Reach License Termination and Site Reuse	88
Nadia Glucksberg, Jay Peters (MACTEC)	
Application of Plants as Biomarkers to Assess Wetland Ecosystem Health	91
T. L. Yankovich, D. A. Kupferschmidt, K. J. Sharp, M. L. Benz, S. B. Kim, C. Shultz, M. Audette-Stuart, J. Carr (AECL)	
The AREVA NC Cadarache Plant Dismantling Plan	95
Noël De Sainte-Marie (AREVA NC)	
Commercialization of a DOE Laboratory	98
Barry A. Stephenson (MCL)	
Considerations for NDA in Waste and D & D Applications	101
Bruce Gillespie (Canberra Indus)	
Making the Optimal Decision in Selecting Protective Clothing	105
J. Mark Price (SCE)	
Uranium Transport Modeling	109
William D. Bostick (MCL)	

Web-Based Training on Reviewing Dose Modeling Aspects of NRC Decommissioning and License Termination Plans	112
D. Lepoivre, J.-J. Cheng, S. Kamboj, J. Arnish, P. Richmond, S. Y. Chen (ANL), C. Barr, C. McKenney (NRC)	
Application of Data Quality Objectives in Decommissioning Plans	114
Ken Duvall (N.E. Research)	
Decommissioning Nuclear Facilities: First Lessons Learned from UP1, Marcoule, France	117
Jean-Michel Chabeuf (AREVA NC), Didier Boya (CEA)	
Potential Indoor Worker Exposure from Handling Area Leakage: Dose Calculation Methodology and Example Consequence Analysis.....	120
Razvan Nes, Roland R. Benke (CNWRA)	
Plutonium Finishing Plant Sub-Grade EE/CA Evaluation of Alternatives: A New Method	124
Stacy Charboneau (DOE), Rick Bond (Washington State Dept of Ecology), Andrea Hopkins, Ana Sherwood, D. B. Klos (Fluor Hanford), Chuck Negin (PEC)	
A New Approach to Development of Voluntary Decommissioning Standards.....	127
Lawrence M. Zull (DNFSB), Lawrence E. Boing (ANL), Richard H. Meservey	
System Chemical Decontamination Technology by the IF₇ Gas	130
Akira Ema, Noritake Sugitsue, Tomohisa Zaitso (JAEA)	
Packaging, Transportation, and Disposal Logistics for Large Radioactively Contaminated Reactor Decommissioning Components	133
Mark S. Lewis (EnergySolutions)	
Regulatory Experiences for the Decommissioning of the Research Reactor in Korea	135
Kyung-Woo Choi (KINS)	
Automatic Estimation of the Radiological Inventory for the Dismantling of Nuclear Facilities	139
R. Garcia-Bermejo, A. Felipe, S. Gutierrez, E. Salas (IBERDROLA Ingenieria Y Construccion), N. Martin (ENRESA)	
Integrating the Clearance in NPP Residual Material Management	142
R. Garcia-Bermejo, B. Lamela (IBERDROLA Ingenieria Y Construccion)	

TUESDAY, SEPTEMBER 18, 2007 • 8:30 A.M.

International Projects—II. Session Cochairs: Jean-Guy Nokhamzon (CEA), Dennis Resienweaver (Alon Science & Technol)

Radiochemistry Lab Decommissioning and Dismantlement at AECL, Chalk River Labs, Ont. Canada.....145
Stephen Kenny (AECL), invited

Decommissioning Operations at the Cadarache Nuclear Research Center148
E. Gouhier (CEA)

Decommissioning of the Nuclear Licensed Facilities at the Fontenay aux Roses CEA Center150
Michel Jeanjacques, Laurence Piketty, Lionel Mandard, Guy Pedron, Jean François Boissonneau, Alain Fouquereau, Eric Pichereau, Nathalie Lethuaire, David Estivie, Cédric Binet, Igor Meden (CEA)

PHENIX Decommissioning Project—Overview154
Michel Soldaïni (CEA)

International Research Reactor Decommissioning Project.....157
Leonardo Leopando (Philippine Nuclear Research Inst), Ernst Warnecke

DOE Projects—I: Savannah River. Session Cochairs: William Austin (Washington SRC), Ray Hannah (DOE)

Facility Deactivation and Decommissioning at the Savannah River Site161
John C. Gilmour (CH2SRC), Helen L. Belencan (DOE-SR)

The Cold and Dark Process at the Savannah River Site163
John C. Gilmour (CH2SRC), Michael L. Willis (Washington SRC)

Decommissioning of the 247-F Fuel Manufacturing Facility at the Savannah River Site (SRS)165
Joseph K. Santos, Stephen M. Chostner (Washington SRC)

Decommissioning the Physics Laboratory, Building 777-10A, at the Savannah River Site (SRS)169
John C. Musall, Jeff L. Cope (Washington SRC)

Demolitions of the Savannah River Site's Concentrator and Finishing Facilities.....172
Paul McDonagh (Bechtel Savannah River Inc)

Area Completion Strategies at Savannah River Site: Characterization for Closure and Beyond174
Laura Bagwell, Sadika O'Quinn, Mark Amidon (SRS)

Groundwater Issues. Session Cochairs: Richard Fil (Robinson & Cole), Pete Fledderman (SRS)

Myth and Reality in Hydrogeological Site Characterization at DD&R Sites	177
Yoram Rubin (Univ of California, Berkeley)	
Preplanning for D&D: Monitoring the Vadose Zone at Radioactive Waste Trenches	180
Douglas E. Wyatt (WGSMS)	
The Tritium Underflow Study at the Savannah River Site	182
Robert A. Hiergesell (SRNL)	
Reaching Site Closure for Groundwater Under Multiple Regulatory Agencies	185
N. Glucksberg, Gene Shephard, Jay Peters (MACTEC), B. Couture (CYAPCO)	
Understanding Contaminant Transport Pathways at Rocky Flats—A Basis for the Remediation Strategy	188
Ian Paton (Wright Water Engineers)	
Groundwater Monitoring and Control Before Decommissioning of the Research Reactor VVR-S Magurele-Bucharest	191
Mitica Dragusin (National Inst of Physics & Nuclear Eng))	
 Dismantlement Technology. Session Cochairs: Georg Mauer (UNLV), Lisa Mullen (Bluegrass Concrete Cutting)	
Mechanical Cutting of Irradiated Reactor Internal Components	194
Michael G. Anderson (MOTA Corp)	
Disassembly and Sanitization of Classified Matter	198
Dwight J. Stockham, Max P. Saad (SNL)	
Development of Digital Mock-Up for the Assessment of Dismantling Scenarios	200
Sung-Kyun Kim, Hee-Sung Park, Kune-Woo Lee, Chong-Hun Jung (KAERI)	
Repackaging Rocky Flats Legacy Transuranic Waste	203
Jeri Lynne McTaggart (LANL)	
Fast Track Characterization of Highly Radioactive Waste Pits Combining Off-the-Shelf Robotics with Innovative Investigation Protocols	205
Jean-Michel Chabeuf, Didier Boya (AREVA NC)	
Metal Cutting for Large Component Removal	206
Robert M. Hulick (Bluegrass Concrete Cutting), invited	

TUESDAY, SEPTEMBER 18, 2007 • 1:00 P.M.

International Projects—III. Session Cochairs: John Parkyn (Private Fuel Storage), Sue Aggarwal (New Millennium Nuclear Technol)

Long Term Storage with Surveillance of Canadian Prototype Nuclear Power Reactors208
Rick Janzen (AECL)

Application of the New Decommissioning Regulation to the Nuclear Licensed Facilities (NLF) on Fontenay-aux-Roses’s Nuclear Center (CEA)210
Josiane Sauret, Laurence Piketty, Michel Jeanjacques (CEA)

Maintaining Quality in a Decommissioning Environment214
Michael Attas (AECL)

Cleanup of Nuclear Licensed Facility 57216
Michel Jeanjacques, Marie Pierre Bremond, Carole Marchand, Cécile Poyau, Cécile Viallefont, Laurent Gautier, Frédéric Masure (CEA)

Issues Associated with Tritium Legacy Materials220
Michael Mills (Atomic Weapons Establishment)

Management of Decommissioning on a Multi-Facility Site224
Michele Laraia (IAEA), Peter McIntyre (Private Consultant), Abrie Visagie (NECSA)

DOE Projects—II. Session Cochairs: Andrew Szilagyi (DOE), Jim Bollinger (SRNL)

K25/K27 Characterization for Demonstrating Criticality Incredibility K-25/ K-27 D&D Project228
Mahmoud H. Haghighi, Kathleen E. Howe, John R. Chandler (Bechtel Jacobs)

K-25 Structural Separation and Demolition231
Frank Cater (Bechtel Jacobs)

Impacts to Project from ⁹⁹Tc Contamination on the K-25/K-27 Decontamination and Decommissioning Project233
Paul Larson, Greg Boris (Bechtel Jacobs)

Explosive Demolition of a Fire-Water Tower at East Tennessee Technology Park, Oak Ridge, TN236
R. D. Brooksbank, M. S. Rood, S. K. Amrit, M. S. Harper, D. J. Dypoit (Bechtel Jacobs), Mike Brehse (MCM Management)

Phased Demolition of an Occupied Facility	239
Lawrence M. Brede, Merl J. Lauterbach, Brandon W. Witt, James McCague (Bechtel Jacobs)	
Nuclear Rocket Facility Decommissioning Project: Controlled Explosive Demolition of Neutron-Activated Shield Wall.....	242
Jerel Nelson (Polestar Applied Technol), Mike Kruzic (National Security Technol), Rodney Simonsen (Exelon), invited	
 Regulatory Infrastructure. Session Cochairs: <i>Lawrence Zull</i> (DNFSB), <i>Jack Hayes</i> (NRC)	
U.S. EPA Superfund Program's Policy for Community Involvement at Radioactively Contaminated Sites	245
Pat Carey, Stuart Walker (EPA)	
Safety of Decommissioning of Nuclear Facilities	248
B. Batandjjeva, E. Warnecke, R. Coates (IAEA)	
Safety Oversight of Decommissioning Activities at DOE Nuclear Sites	249
Lawrence M. Zull, William Yeniscavich (DNFSB)	
Implementation of 10 CFR 20.1406 Through Life Cycle Planning for Decommissioning	252
E. O'Donnell, W. R. Ott (NRC)	
Memorandum of Understanding Between U.S. EPA Superfund and U.S. NRC	256
Stuart Walker (EPA)	
Potential Indoor Worker Exposure from Handling Area Leakage: Example Event Sequence Frequency Analysis	258
Roland R. Benke, George R. Adams (CNWRA)	
 Decontamination Technology. Session Cochairs: Al Solano (Solano Consulting & Field Svc), Lynne Goodman (Detroit Edison)	
Decontamination of Terrorist-Dispersed Radionuclides from Surfaces in Urban Environments.....	261
Robert Fischer, Mark Sutton, Dianne Gates-Anderson, Jeremy Gray, Qinhong Hu, Walt McNab, Brian Viani (LLNL)	
Accuracy Analysis of a Robotic Radionuclide Inspection and Mapping System for Surface Contamination	263
Georg F. Mauer, Chris Kawa (UNLV)	

Diamond Shaving of Contaminated Concrete Surfaces265
Lisa K. Mullen (Bluegrass Concrete Cutting)

Cleaning Residual NaK in the Fast Flux Test Facility Fuel Storage Cooling System267
T. M. Burke, W. R. Church (Fluor Hanford), K. M. Hodgson (Fluor Government Group)

Decontamination of Tritiated Water Using Superhydrophobic Pt-Catalyst Synthesized with Water-in-Supercritical CO₂.....270
Youichi Enokida (EcoTopia Science Inst/Nagoya Univ), Ryosuke Shimizu (EcoTopia Science Inst), Kayo Sawada (EcoTopia Science Inst/Nagoya Univ), Ichiro Yamamoto (Nagoya Univ)

The Feasibility Study of Hot Cell Decontamination by the PFC Spray Method272
Hui-Jun Won, Chong-Hun Jung, Jei-Kwon Moon (KAERI)

WEDNESDAY, SEPTEMBER 19, 2007 • 8:30 A.M.

Lessons Learned. Session Cochairs: Mike Lackey (Fluor Hanford), Sandra Waisley (DOE)

Preservation and Implementation of Decommissioning Lessons Learned in the United States Nuclear Regulatory Commission274
Rafael L. Rodriguez (NRC)

Worldwide Overview of Lessons Learned from Decommissioning Projects.....277
Michele Laraia (IAEA)

Fluor Hanford Alara Center is a D&D Resource281
L. O. Waggoner (Fluor Hanford)

Daddy, What's a Nuclear Reactor?283
Dennis W. Reisenweaver (Alion Science & Technol)

Lessons Learned From Radioactive Waste Storage and Disposal Facilities.....287
David W. Esh, Anna H. Bradford (NRC)

Lessons From Love Canal: Considerations for the Effective Use of Institutional Controls290
Richard M. Fil (Robinson & Cole)
290

DOE Projects—III. Session Cochairs: Bill Franz (LATA/Parallax Portsmouth), Larry Boing (ANL)

Decommissioning the 216-Z-9 Crib Plutonium Mining Facility at the Plutonium Finishing Plant: Issues Characterization294
S. Charboneau (DOE), A. Hopkins, C. Sutter (Fluor Hanford), J. Teal (Fluor Government Group)

Radiological Controls for Plutonium Contaminated Process Equipment Removal from the 232-Z Contaminated Waste Recovery Process Facility at the Plutonium Finishing Plant297
A. Hopkins, B. Klos, M. Gerber, M. Minette, S. Snyder (Fluor Hanford), E. Lloyd, J. Teal (Fluor Government Group), S. Charboneau (DOE)

Closure of the Fast Flux Test Facility: Current Status and Future Plan301
O. A. Farabee (DOE), W. V. Witherspoon (Fluor Hanford)

Unusual Decommissionings of Contaminated Facilities at the Savannah River Site—The Demolition of Cooling Towers 285-H and 285-F304
William E. Austin, Guy R. Baldwin (Washington Savannah River Company)

Deactivation and Decommissioning Planning and Analysis with Geographic Information Systems307
James S. Bollinger, Larry D. Koffman, William E. Austin (SRNL)

Decommissioning Lines-of-Inquiry for Design Review of New Nuclear Facilities.....309
C. A. Negin, C. S. Urland (PEC)

Dose Modeling and Radiation Measurement. Session Cochairs: Myron Kaczmarzky (Bartlett), Nadia Glucksberg (MACTEC Eng and Consulting)

SRNL All-Pathways Application311
Larry D. Koffman, Elmer L. Wilhite, Leonard B. Collard (SRNL)

Correlation of Scan and Sample Measurements Using Appropriate Sample Size.....313
Jeff Lux (Independent Consultant)

Carbon-14 Specific Activity Model Validation for Biota in a Wetland Environments318
T. L. Yankovich, K. J. Sharp, M. L. Benz, J. Carr, R. W. D. Killey (AECL)

Area Factor Determinations for an Industrial Worker Exposed to a Concrete Slab End-State.....323
G. Timothy Jannik, Patricia L. Lee, Eduardo B. Farfan, Jesse L. Roach (SRNL)

An Innovative Approach for the Calculation of Exposure Point Concentrations for Large Areas of Surface Radionuclide Contamination.....326
F. Winchester Chromec, Jeffrey C. Myers (Washington SMS)

Modern Sorters for Soil Segregation on Large Scale Remediation Projects.....329
J. J. Shonka, J. E. Kelley, J. M. O'Brien (Shonka Research Assoc)

WEDNESDAY, SEPTEMBER 19, 2007 • 1:00 P.M.
Closing Plenary. Session Chair: *James Byrne (Byrne & Assoc)*

Improving the Identification, Dissemination and Implementation of Deactivation and Decommissioning Lessons Learned and Best Practices332
Sandra L. Waisley (DOE), Michael B. Lackey, Lansing G. Dusek (Fluor)

The Fernald Closure Project: Lessons Learned335
Cornelius M. Murphy, Dennis Carr (Fluor Government Group)

Lessons Learned from the Decommissioning of Nuclear Facilities and the Safe Termination of Nuclear Activities: Outcomes of the International Conference, 11-15 December 2006, Athens, Greece336
B. Batandjieva, M. Laraia (IAEA)