# Decommissioning, Decontamination, and Reutilization Topical Meeting 2010

(DD&R 2010)

Idaho Falls, Idaho, USA 29 August - 2 September 2010

ISBN: 978-1-61782-000-7

#### Printed from e-media with permission by:

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



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

Copyright© (2010) by the American Nuclear Society All rights reserved.

Printed by Curran Associates, Inc. (2010)

For permission requests, please contact the American Nuclear Society at the address below.

American Nuclear Society 555 North Kensington Avenue LaGrange Park, Illinois 60526

Phone: (800) 323-3044 (708) 352-6611

Fax: (708) 352-0499

### www.ans.org

### Additional copies of this publication are available from:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 USA

Phone: 845-758-0400 Fax: 845-758-2634

Email: curran@proceedings.com Web: www.proceedings.com

# **TABLE OF CONTENTS**

# Monday Afternoon, August 30, 2010

Session Chairs: Lynne Goodman (Detroit Edison), John Hayes (NRC)	
Power Reactor Decommissioning—Regulatory Experiences from Trojan to Rancho Seco and Plants In-Between  Kris Banovac, John Buckley, John Hickman, Andrew Persinko, James Shepherd, Theodore Smith, Bru	<b>1</b> uce
Watson	
La Crosse BWR Reactor Pressure Vessel Removal Michael Brasel	5
Lessons Learned from the NASA Plum Brook Reactor Facility Decommissioning Keith Peecook	9
Decommissioning on a Multi-Generational Site  Lynne S. Goodman	13
Decommissioning a Nuclear Power Plant While Constructing a New Fossil Plant  Dustin G. Miller	15
AEA Special Session Session Chairs: Michele Laraia (IAEA), Kurt Lauridsen (Danish Decommissioning)	
Stakeholders in Decommissioning Projects: Expect the Unexpected  Michele Laraia	17
Relevant Information and Contents in a Research Reactor Decommissioning Plan Pablo Andrade Grossi, Clédola Cássia Oliveira de Tello	22
The Decommissioning, Decontamination and Reutilisation of the Redundant Necsa Uranium Conversion Facility  Elna Fourie	26
Decommissioning of a Small Nuclear Facility  Doris A. Minor	29
A Monte Carlo Method to Evaluate the Gamma Contamination Inside a Research Reactor Primary Cooling System  Anastasia Savidou	32

Experience Gained in the Decommissioning of the Danish 5 MW Research Reactor DR2 Kurt Lauridsen, Niels Strufe	35
Remote Technologies Session Chairs: Mark Noakes (ORNL), Larry Zirker (INL)	
Force Feedback Remote System: An Industrial Solution for Adaptive Dismantling Operations Jean-Marc Idasiak, Fredéric Briones, Thierry Currenti	39
Cracked Workmanship Samples Facilitate Radiation Field Remote Inspection Larry R. Zirker, James A. Dowalo	43
Remote Inspection, Monitoring, and Characterization of Contaminated Off-Gas Stack Internals	50
M. W. Noakes, R. F. Lind, P. D. Lloyd, J. C. Rowe, F. G. Pin	
Diver and Robotic Approaches to Decontamination and Decommissioning  Charles A. Vallance, John W. Bramblet	52
Powered Remote Manipulator (PRM)  Marc Rood (Special Applications Technology)	55
Environmental Issues Session Chairs: Scott Reno (CH2M –WG Idaho), Stuart Walker (EPA)	
Optimizing Hydrogeological Monitoring at the Whiteshell Laboratories Waste Management Area	58
W. R. Ridgway, R. S. Carter	
Groundwater Monitoring Program at Al-Tuwaitha Nuclear Research Center, Iraq Mohammad Jawad Abbas, Kamal Hussein Latif, Bushra Ali Ahmed	61
Modelling Contamination Resuspended by Traffic in Risk and Dose Assessments Stuart Walker	64
Environmental Modeling of the Intercompartmental Distribution of Low-Level Radioactive Wastes  Maria de Lurdes Dinis, António Fiúza	67
Development and Implementation of an Assay System for Rapid Screening of Transuranic Waste in Highly Contaminated Environments  Douglas Akers, Hopi Salomon, Lyle Roybal	71
Evolving Adjustments to External (Gamma) Slope Factors for CERCLA Risk and Dose Assessments Stuart Walker	75

# Monday Evening, August 30, 2010

Poster Session  Judges: Sue Aggarwal (NMNT International), Larry Boing (ANL), Jean-Guy Nokhamzon (CEA)	
Decontamination of Uranium and Antimony from the Spent Catalyst for the Sohio Acrylonitrile Process  Youichi Enokida, Kayo Sawada, Hiroshi Sugai	77
Building 18: Operating Feedback from Cleaning and Dismantling of Glove Boxes and Shielding Lines  Michel Jeanjacques, Marie Pierre Bremond, Laurent Gautier, Guy Viellard, David Estivié, Eric F	<b>79</b> Pichereau
Clean-Up of Building 18. Operating Feedback on Pumping Out the PETRUS Tank Michel Jeanjacques, Carole Marchand, Frederic Masure, Laurent Gautier	83
Use of Leading Indicators and Treading to Support DD&R at Savannah River Nuclear Solutions  Anthony Umek, Steven Prevette	86
Reaction of Palladium Iodine with Sodium Nitrate or Sodium Molybdate Melt Kayo Sawada, Youichi Enokida	89
Windscale Piles Decommissioning—Interactive Safety Documentation  J. C. Jennings	92
A Simple Model to Residual Material Clearance or Recycling Rafael Garcia-Bermejo Fernandez	94
Good Practices in the Nuclear Research Reactor VVR-S Margurele-Bucharest Romania Decommissioning Planning and Starting the Project Mitica Dragusin	97
Removing Dry Asbestos from the Sodium-Cooled EBR-II Reactor Building and Associate Piping  Brian M. Perkes	ed 101
Test Reactor Area 661 Californium (Cf-252) Cave Deactivation and Decommissioning Wiley R. Spruill, Craig A. Nesshoefer, Jason L. Casper	103
Reactor Test Complex Building 661 Alpha Wing Hot Cell Deactivation and Decommissioning  Wiley R. Spruill, Craig A. Nesshoefer, Jason L. Casper	106
Illumination of Cold and Dark Projects During Decommissioning and Deactivation Kirk J. Dooley, Jose L. Vargas, Mark Slovak	109
A Risk Communication Success Story Keith Peecook	112
Massimetric Gamma Efficiency Calibrations—Why They Are Better than Traditional Efficiency Calibrations for D&D and ER Gamma Spectroscopy Measurements  Frazier Bronson	116

Stuart Walker	120
EPA Superfund Program's Policy for Risk and Dose Assessment Stuart Walker	123
In-Situ Disposition of Accountable Special Nuclear Material  James W. Barker, A. Bruce Culp, H. Wayne Smith	126
Complexities of Decommissioning a Uranium Mill Site  Matthew Meyer	130
Acceleration of Mapping Strategies for B&W Y-12 ARRA Project Characterization and Disposition  Joseph W. Birchfield, III, Linda Albrecht	133
R- & P- Reactor Vessel In-Situ Decommissioning Visualization Nicholas Vrettos, John Bobbitt, Matthew Howard	137
R & P Reactor Building In-Situ Decommissioning Visualization  John Bobbit, Nicholas Vrettos, Matthew Howard	142

# Tuesday Morning, August 31, 2010

daho National Laboratory Projects Session Chairs: Dave Hilyer (The Shaw Group), Wiley Spruill (CH2M-WG Idaho)	
Technical Issues and Resolutions for Removing Complex Tank Systems at the Idaho National Laboratory Taryl L. Huebner, Mary T. Magleby	146
ALARA and the Engineering Test Reactor Removal Wiley R. Spruill, Craig A. Nesshoefer, Jason L. Casper	148
Engineering Test Reactor Equipment and Personnel Release for Ni-63 (Low-Energy Beta Emitters)  Wiley R. Spruill, Craig A. Nesshoefer, Jason L. Casper	151
PBF Cubicle 13 Severe Fuel Damage Hot Spot Removal and Waste Disposition Wiley R. Spruill, Craig A. Nesshoefer, Jason L. Casper	154
Power Burst Facility Reactor Removal Wiley R. Spruill, Craig A. Nesshoefer, Jason L. Casper	156
In-Place Grouting and Disposition of Highly Radioactive Components Using Wire-Saw Cutting Techniques  James W. Barker, Nathan L. Bridges, Thomas D. Dogal	159
The Accelerated Retrieval Project: A Large-Scale Transuranic Waste Retrieval Project at the Idaho National Laboratory	162

Frazier Bronson

**Geometries** 

T. Spillane, N. Menaa, A. Bosko, R. Venkataraman, F. Bronson, V. Atrashkevich, D. Nakazawa, W. R. Russ

205

An Adaptive Approach to Mathematical Efficiency Calibration with Uncertain Source

### **Lessons Learned**

Session Chairs: Larry Boing (ANL), Nadia Glucksberg (Hayley & Aldrich)

Planning for Decommissioning or Ignorance is Bliss W. J. Manion	209
NEA International Co-Operative Programme on Decommissioning (CPD/TAG)  Jan Carlsson, Patrick O'Sullivan, Jean-Guy Nokhamzon, Bob Burton	212
EPRI Nuclear Power Plant Decommissioning Technology Program Richard McGrath, Sean Bushart, Karen Kim, Michael Naughton	215
Feedback Experience from the Decommissioning of Spanish Nuclear Facilities Alejandro Rodriguez	218
French CEA's Site Cleanup Methodology and Related Applications  Didier Dubot, Julien Attiogbe	220
Technology Preservation and Transfer for Nuclear Power Plant Decommissioning Takeshi Ishikura, Shigenobu Hirusawa	223

### Tuesday Afternoon, August 31, 2010

### International Projects—II

Session Chairs: Michel Kiefer Jeanjacques (CEA), Kristan J. Schruder (AECL)

Decommissioning Project of JAEA Uranium Refining and Conversion Plant Nobuo Takahashi, Yasuyuki Morimoto, Noritake Sugitsue	225
The Decommissioning of AECL's Heavy Water Upgrading Plant K. Schruder, P. Seto, T. Bedi	229
AREVA Return on Experience from D&D—What We Have Learned So Far Jean-Michel Chabeuf, Frédéric Chambon, Guy Decobert, Thierry Varet	232
Cleansing and Dismantling of CEA-Saclay Nuclear Licensed Facilities  Michel Jeanjacques, Rebecca Glévarec, Isabelle Delaire	234
Decommissioning Project of Uranium Conversion Plant  Doo Seong Hwang, Kue III Lee, Yun Dong Choi, Un Soo Chung	238
Underground Research Laboratory Closure and the Enhanced Sealing Project J. B. Martino, D. A. Dixon, D. P. Onagi	240

Session Chairs: Sue Aggarwal (NMNT International), Rob Woodard (Energy Solutions)	
Characterization of Vandellós 1 Reactor Caisson Francisco Madrid, Juan L. Santiago, Sue Aggarwal, Grant Charters	243
Characterization of Nuclear Reactor Concrete Bioshields, Walls, Slabs and Subsurface Materials Using TruPro® Proprietary System  G. Charters, S. Aggarwal	245
Development of Characterization Tools for Contaminated Nuclear Stacks William Mendez, Mario Vargas	249
Geostatistics for Radiological Evaluation and Risk Analysis of Contaminated Premises Y. Desnoyers, JP. Chilès, D. Dubot, N. Jeannée, JM. Idasiak	251
Spectroscopic Measurements with a Solid-State Photomultiplier Coupled Scintillation  Detector  Christopher Stapels, Erik Johnson, Eric Chapman, Xiao Jie Chen, Guy Alberghini, James Christian	255
High-Resolution Spectral Gamma Logging to Investigate Subsurface Radiological Contamination Rick McCain	259
Fast Reactor Decommissioning Session Chairs: Jason Casper (Ch2M-WG Idaho), Danny Swindle (Sargent & Lundy)	
Initiating the D&D Project for the EBR-II Rick Demmer	261
Technical Challenges Associated with the EBR-II Reactor Project and the Plan for Success Jason L. Casper, Kirk J. Dooley, James W. Barker, R. Glenn Barnette, Brian M. Perkes, Wiley R. S	<b>263</b> Spruill
Processing Sodium at Detroit Edison's Fermi 1 Plant Hindsight: What Worked and What Did Not Work  Danny Swindle	265
Processing of Residual Sodium in the BN-350 Reactor Coolant Circuits  O. Romanenko, G. Pugachev, A. Rovneyko, Y. Shirobokov, V. Maev, J. A. Michelbacher, C. Knight A. R. Herrick	<b>268</b> t, D. Wells,
US and UK Contributions to the Decommissioning of Kazakhstan's BN-350 Reactor	272

# Wednesday Morning, September 1, 2010

### Savannah River D&D Projects

D. Wells, J. Michelbacher, T. Hayward

Session Chairs: Bill Austin (SRNS), Diana Hannah (DOE-SR)

American Recovery and Reinvestment Act Overview at Savannah River Site  Tom Gaughan, Mary Flora	276
Heavy Water Components Test Reactor Decommissioning—Major Component Removal William E. Austin, Donald S. Brinkley	279
Planning for Decontamination of the Plutonium Fuel Form (PuFF) Facility at the Savania River Site (SRS)  Joseph K. Santos, Heatherly H. Dukes	nah 282
Draining Hazardous Fluids During Building 221-1F Deactivation at the Savannah River Site (SRS)  John C. Musall	286
Evaluation of Activation Products in Remaining R- and P-Reactor Structures  D. W. Vinson, R. L. Webb, G. R. Rose, R. L. Sindelar	290
Characterization of Radioactivity in the Reactor Vessel of the Heavy Water Component Test Reactor (HWCTR)  D. W. Vinson, S. H. Reboul, R. L. Webb, W. E. Austin, Jr.	293
International Projects—III Session Chairs: W. Randall Ridgway (AECL), Larry Zull (DNFSB)	
Windscale Piles Decommissioning—Polymer as an Encapsulant  J. N. Clifford	295
Spent Fuel Removal from NLF 72 Concrete Dry Storages  Marc Butez, Gilles Barrachin, Michel Jeanjacques	299
Update on José Cabrera NPP Decommissioning Nieves Martín, Juan Luis Santiago	303
Integration of Multiple Technologies and Engineering to Perform Decommissioning Operations—The Fuel Channel Retrieval Tool (FCRT)  Michael Auen	305
Technology Decon/Dismantlement Session Chairs: Lisa Mullen (Independent), Leonel E. Lagos (Florida International Univ)	
Brookhaven Graphite Research Reactor (BGRR) D&D Project—S. A. Technology (SAT)  Bill Kirby	307
Innovative ALARA Tools and Work Practices Used at the DOE Hanford Site  Larry Waggoner	311
Decoding Selected NFPA Codes for D&D Operations  Jose L. Vargas, Kirk J. Dooley, Justin L. Coleman	314
Decontamination of Tubings Using Vibration Technology Akramullah Aminy, Sascha Gentes, Frank Ambos	318

CORD Decontamination Technologies for Decommissioning—Continuous Improvement over Thirty Years  Christoph Stiepani, Kayla Harper	321
Surface Decontamination with an Optimized Laser System  F. Champonnois, Ch. Lascoutouna, H. Long, PY. Thro, P. Mauchien	324
Waste Management Issues Session Chairs: Jay Peters (Hayley & Aldrich), John Bowen (Mega-Tech Services)	
Current Issues with Shipment and Disposal of Large Activity Radiation Sources  Dave Schettler, Robert Rushton	327
Sludge Conditioning and Cementation—EDF's NPP: 900 Mw CPO-1300 Mw- and 1450-Mw PWRs  M. T. Chauveau, M. B. Lantes	328
The Port Hope Area Initiative: Canada's Largest Low-Level Radioactive Waste Clean-Up Christine A. Fahey	330
Study on Strategy for Uranium Contaminated Waste from Dismantling of Uranium Related Facilities  Shinji Kawatsuma, Yoshiaki Nakatsuka, Takayuki Tokizawa	333
Implementation of Decommissioning Very Low Level Radioactive Waste Disposal Possibilities to the Calculation Code OMEGA  Matej Zachar, Vladimír Daniška, Vladimír Nečas	337
Development of CLEVES for Clearance Activities in JAEA  Mitsuo Tachibana, Tsutomu Ishigami, Tomonori Satoyama, Michiro Yoshimori	341
Final Plenary	
Honoring the Ghosts of Programs Past: Managing INL Historic Structures in the D&D Era Julie Braun Williams, Hollie K. Gilbert	345