

Fluor Hanford ALARA Center

Activity Report for October 1, 2007

Assistance, Demonstrations, Research, and Tours Provided by the Center

1. The Center is returning low interest tools and equipment to vendors to make room to exhibit new technology. Please contact us if you have a specific interest in a tool or technology that you would like to see here at the Center.
2. Mike Minette of PFP called and requested that we forwarded a list of D&D websites. We forwarded him the D&D website listed in Attachment 2 of this report.
3. CH2MHill Radiological Engineering requested vendor information regarding vendors that could construct a neutron shield to install between TLD storage and a source. We offered several shielding ideas and the following list of vendor websites: <http://www.dufrane.com/>, http://www.johncaunt.com/pages/shielding/neutron_shield.html, <http://wardray-premise.com/products/structural/neutron.html>, <http://www.shieldwerx.com/>.
4. The Center loaned three drain fittings to K Basin to mount in conical-shaped catch basins. Additionally, the Center loaned Groundwater Remediation gloves, rings and filtration for glovebag work. Groundwater ordered the glovebag but not the material to build the bag. We often loan items to projects and request that they replace the items when they get the chance.
5. A Washington Closure Radiological Engineer visited the Center as part of his initial radiological engineering qualification. We discussed several engineering controls, toured the Center, and discussed how to integrate ALARA into work planning.
6. Conducted a tour of the ALARA Center for two personnel from Perma-Fix Northwest (formally called Pacific ECO Solutions). They were extremely interested in all tools and equipment and took several brochures. They then toured the Plastic Shop.
7. Beth Bilson, Fluor Environmental, Safety, Health and Quality VP, toured the ALARA Center.
8. The Center conducted a safety walkdown with safety representative Rick Zimmerman to determine our safety status.

New Process, Tools, or General ALARA Information

1. Environmental Management Engineering and Technology – Making a Difference, March 2007 edition has several articles about remediation activities at Mound, Hanford, Idaho, and Savannah Rives Sites that could help your project. To read the articles go to the DOE Environmental Management website at [http://www.em.doe.gov/pdfs/DOE_EM_PRINT%20\(3\)41307.pdf](http://www.em.doe.gov/pdfs/DOE_EM_PRINT%20(3)41307.pdf).
2. Attachment 1 of this report is a recent ALARA success story from Savannah River F- Area Tank Farm. It is an excellent display of teamwork that incorporates modifications to an existing technology and fabrication of a new tool and shielding items.

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Decommissioning and Deactivation Activities and Information

1. Rocky Flats, "The Closure Legacy" (346 pages) is the full history of the closure effort, covering not only the technical and scientific matters typically addressed in lessons learned arenas, but also the policy and programmatic issues that were addressed during the course of accelerated closure. The complete document can be viewed at http://rockyflats.apps.em.doe.gov/references/Closure_Legacy_Document.pdf . Individual sections of the document or the entire document can be viewed at <http://rockyflats.apps.em.doe.gov/>.

Contacts

Come visit us at the Fluor Hanford ALARA Center; we are located on the Hanford site at 2101M/200E/226. We will do our best to help you with your radiological engineering, ALARA, and D&D challenges. You can also send us questions, comments, and your lessons learned via e-mail or you can contact us by phone. Contact information is below.

Jeff Hunter	(509) 373-0656, Cell (509) 948-5906, jeffrey_l_hunter@rl.gov
Larry Waggoner	(509) 376-0818, Cell (360) 801-6322, larry_o_waggoner@rl.gov
Jerry Eby	(509) 372-8961, Cell (509) 528-3094, gerald_l_eby@rl.gov

ALARA Center Website: www.hanford.gov/rl/?page=974&parent=973

Please help us keep our e-mail address list current by letting us know if you would like added or removed from our distribution, and by keeping us informed of e-mail address changes. Thank you for your help. We look forward to hearing from you.

Attachments:

1. Savannah River ALARA Success
2. List of D&D Websites

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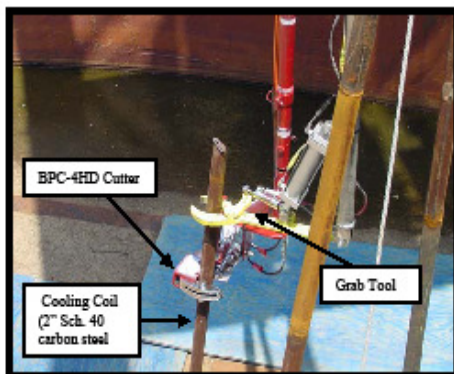
Attachment 1

ESH-RPS-2007-00219

TEAMWORK RESULTS IN F-AREA TANK FARM ALARA SUCCESS STORY AT SRS

Recently, Construction was tasked to install two submersible pumps at Tank 5 in F Tank Farm. To ensure no obstructions were present in the Tank risers that would restrict the installation of two submersible pumps, cameras were inserted into access ports at Risers 3 and 8. A review of the videos revealed that cooling coils in both risers had moved and would hinder the installation of the pumps. Knowing this and keeping ALARA and Safety foremost, the Construction Team Lead, led by engineer Tom France, consulted with the SRS ALARA Center and selected the Mega-Tech Blade Plunging Cutter (BPC-4HD) as the cooling coil cutting tool. The BPC-4HD was modified to add a deployment system for positioning the cutter on the coil. A pneumatic grab tool was designed by Construction to grab the coils as they were cut to control where they landed in the tank. A special riser shield plate was also designed to reduce occupational radiation exposure. These tools would enable the workers to cut the cooling coils remotely through the open tank risers.

Operation of the cutting and grab tools was successfully demonstrated at TNX prior to use in FTF. Below is a picture taken during the mock-up (additional pictures are also attached).



In addition, the following work planning proved noteworthy both during the mock-up and field execution activities.

- The riser was closed during the cutting activities, which eliminated the need for fall protection. The shield plate designed for the riser opening would reduce overall exposure to the individuals performing the task from 2 Rem/hr to 28 mrem/hr.
- A stainless steel sleeve was fabricated and inserted into the riser opening to reduce spread of contamination from the riser wall to the cutting tool. A camera was inserted inside the riser with the tools. The workers were able to view a split screen monitor inside the hut, which enabled them to manipulate the mechanical arms of the tools.

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Attachment 2

Ten Principals and Ten Commandments of Radiation Protection <http://qecc.pnl.gov/10prin.pdf>

The web addresses below lead you to Technology Reports on D&D and Radiation Protection

1. [Decontamination Techniques used in Decommissioning](http://www.nea.fr/html/rwm/reports/1999/decontec.pdf)

<http://www.nea.fr/html/rwm/reports/1999/decontec.pdf>

2. [Aerosol Measurements from Plasma Arc Torch Cuts in Stainless Steel, Carbon Steel, and Aluminum](http://www.osti.gov/bridge/servlets/purl/212430-RTMkqP/webviewable/212430.pdf) <http://www.osti.gov/bridge/servlets/purl/212430-RTMkqP/webviewable/212430.pdf>

3. [Size Distribution and Rate of Production of Airborne Particulate Matter Generated During Metal Cutting](http://www.osti.gov/bridge/servlets/purl/793521-KXvi9G/native/793521.PDF) <http://www.osti.gov/bridge/servlets/purl/793521-KXvi9G/native/793521.PDF>

4. [Cleaning and Decontamination using Strippable and Protective Coatings at INEEL](http://www.osti.gov/bridge/servlets/purl/8239-A64q4z/webviewable/8239.pdf)

<http://www.osti.gov/bridge/servlets/purl/8239-A64q4z/webviewable/8239.pdf>

5. [Contaminated Concrete: Occurrence & Emerging Technologies for DOE Decontamination](http://www.osti.gov/bridge/servlets/purl/162678-cF9kO7/webviewable/162678.PDF)

<http://www.osti.gov/bridge/servlets/purl/162678-cF9kO7/webviewable/162678.PDF>

6. [Experiences in D&D of Former Plutonium Production Reactors at Hanford](http://www5.hanford.gov/pdwdocs/fsd0001/osti/2003/I0040749.pdf)

<http://www5.hanford.gov/pdwdocs/fsd0001/osti/2003/I0040749.pdf>

7. [Decommissioning Information](http://www.decommissioning.info/); <http://www.decommissioning.info/>

8. [Decommissioning Handbook DOE/EM](http://www.efcog.org/wg/dd_fe/docs/decomhandbk.pdf)

0383 http://www.efcog.org/wg/dd_fe/docs/decomhandbk.pdf

9. [Decommissioning Handbook; DOE/EM 0142P](http://www.efcog.org/wg/dd_fe/docs/Decommissioning%20Handbook.pdf)

http://www.efcog.org/wg/dd_fe/docs/Decommissioning%20Handbook.pdf

10. [Lessons Learned from D&D Experiences](http://www.osti.gov/bridge/servlets/purl/769250-NsuyLE/webviewable/769250.pdf) <http://www.osti.gov/bridge/servlets/purl/769250-NsuyLE/webviewable/769250.pdf>

11. [Survey of Decontamination Processes Applicable to DOE Nuclear Facilities](http://www.osti.gov/bridge/servlets/purl/565632-1abeKG/webviewable/565632.PDF)

<http://www.osti.gov/bridge/servlets/purl/565632-1abeKG/webviewable/565632.PDF>

12. [Decontamination Technologies used in Decommissioning Activities](http://www.nea.fr/html/rwm/reports/1999/decontec.pdf)

<http://www.nea.fr/html/rwm/reports/1999/decontec.pdf>

13. [Dismantling Techniques](http://www.osti.gov/bridge/servlets/purl/656734-E5dgYh/webviewable/656734.pdf) <http://www.osti.gov/bridge/servlets/purl/656734-E5dgYh/webviewable/656734.pdf>

14. [Technology Assessment of Dust Suppression Techniques Applied during Structural Demolition](http://www.osti.gov/bridge/servlets/purl/955-qPDW72/webviewable/955.PDF) <http://www.osti.gov/bridge/servlets/purl/955-qPDW72/webviewable/955.PDF>

15. [Equipment Decontamination; A Brief Survey of the DOE Complex](#)

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<http://www.osti.gov/bridge/servlets/purl/197213-wYRxYV/webviewable/197213.PDF>

16. Guidelines for Fire Protection of Abandoned Facilities and Facilities Undergoing D&D

http://www.hss.energy.gov/nuclearsafety/nsea/fire//guidance/d_d_draft.pdf

17. Dismantling of Gloveboxes for MOX Fabrication by a Glovebox Dismantling Facility

<http://www.wmsym.org/Abstracts/2002/Proceedings/14/246.pdf>

18. Robotic Systems for Glovebox Size Reduction

<http://www.osti.gov/bridge/servlets/purl/752537-Gm82HG/webviewable/752537.pdf>

19. D&D of 61 Plutonium Gloveboxes at Argonne

<http://www.osti.gov/bridge/servlets/purl/426980-7nKgwi/webviewable/426980.PDF>

20. Glovebox Dismantling and Equipment Protection in Contaminated Environments

<http://www.wmsym.org/abstracts/2003/pdfs/39.pdf>

21. Glovebox Throughput for Remote Operation Size Reduction System

<http://www.osti.gov/bridge/servlets/purl/761551-R608Eh/webviewable/761551.pdf>

22. Glovebox Characterization & Barrier Integrity Testing using Fluorescent Powder

<http://www.osti.gov/bridge/servlets/purl/266621-yN95fP/webviewable/266621.pdf>

23. Decontamination of Surfaces by Blasting with Crystals of water and CO₂

<http://www.osti.gov/bridge/servlets/purl/46592-vRIIdRy/webviewable/46592.PDF>

24. Guide to Selecting Non-Powered Handtools [http://www.cdc.gov/niosh/docs/2004-](http://www.cdc.gov/niosh/docs/2004-164/pdfs/2004-164.pdf)

[164/pdfs/2004-164.pdf](http://www.cdc.gov/niosh/docs/2004-164/pdfs/2004-164.pdf)

25. Heat Stress Info <http://www.pp.okstate.edu/ehs/links/heat.htm>

26. Shielded Cells D&D and Dismantlement System Requirements

<http://www.osti.gov/bridge/servlets/purl/67617-cqIZf3/webviewable/67617.PDF>

27. Technical Aspects and Benefits of Small-Scale Hydrolasing Compared to Conventional

Decon Methods http://www.joelkohler.com/samples_writing/Technical_Aspects.pdf

28. Large Bore Pipe Decon [http://www.osti.gov/bridge/servlets/purl/665905-](http://www.osti.gov/bridge/servlets/purl/665905-0PLeJU/webviewable/665905.PDF)

[0PLeJU/webviewable/665905.PDF](http://www.osti.gov/bridge/servlets/purl/665905-0PLeJU/webviewable/665905.PDF)

29. Laser Cutting Info <http://www.teskolaser.com/laserglossary.html>

30. A Survey of Commercially Available Manipulators, End-Effectors, and Delivery Systems for

Reactor Decommissioning Activities [http://www.osti.gov/bridge/servlets/purl/272556-](http://www.osti.gov/bridge/servlets/purl/272556-uAcXSf/webviewable/272556.PDF)

[uAcXSf/webviewable/272556.PDF](http://www.osti.gov/bridge/servlets/purl/272556-uAcXSf/webviewable/272556.PDF)

31. MARSSIM <http://www.epa.gov/radiation/marssim/>

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[32. Application of Metal Cutting Techniques in Tasks Performed in Radioactive Environments](http://www.osti.gov/bridge/servlets/purl/473994-E9yPWg/webviewable/473994.pdf)
<http://www.osti.gov/bridge/servlets/purl/473994-E9yPWg/webviewable/473994.pdf>

[33. Nuclear Air Cleaning Handbook: DOE-HDBK 1169-2003](http://www.hss.energy.gov/NuclearSafety/techstds/standard/hdbk1169/index.html)
<http://www.hss.energy.gov/NuclearSafety/techstds/standard/hdbk1169/index.html>

[34. OSHA Search Page](http://www.osha.gov/pls/oshaweb/searchresults.AdvancedSearch) <http://www.osha.gov/pls/oshaweb/searchresults.AdvancedSearch>

[35. Stabilization of Residue Plutonium in L-9 Hood in Product Removal of PUREX with Polymeric Barrier System](http://www.osti.gov/bridge/servlets/purl/657346-Szs15J/webviewable/657346.PDF) <http://www.osti.gov/bridge/servlets/purl/657346-Szs15J/webviewable/657346.PDF>

[36. Pipe Crawler Internal Pipe Characterization System](http://www.osti.gov/bridge/servlets/purl/621859-OIKp2w/webviewable/621859.PDF)
<http://www.osti.gov/bridge/servlets/purl/621859-OIKp2w/webviewable/621859.PDF>

[37. Plasma Cutting Information](http://www.azom.com/details.asp?ArticleID=1061&head=Plasma%2BCutting%2B%96%2BThe%2BHistory%2Bof%2BPlasma%2BCutting)
<http://www.azom.com/details.asp?ArticleID=1061&head=Plasma%2BCutting%2B%96%2BThe%2BHistory%2Bof%2BPlasma%2BCutting>

[38. Spray-on Polyurea Coating for Use with Radioactive Waste Shipping Containers](http://www.wmsym.org/abstracts/2003/pdfs/528.pdf)
<http://www.wmsym.org/abstracts/2003/pdfs/528.pdf>

[39. Waste Packaging Using Polyurea Coatings](http://www.wmsym.org/abstracts/2003/pdfs/169.pdf)
<http://www.wmsym.org/abstracts/2003/pdfs/169.pdf>

[40. Development of Personal Protective Equipment for D&D](http://www.osti.gov/bridge/servlets/purl/772502-zMOIOJ/webviewable/772502.pdf)
<http://www.osti.gov/bridge/servlets/purl/772502-zMOIOJ/webviewable/772502.pdf>

[41. Radioactive Contamination Incidents Involving Protective Clothing](http://www.osti.gov/bridge/servlets/purl/399712-XcBWY2/webviewable/399712.PDF)
<http://www.osti.gov/bridge/servlets/purl/399712-XcBWY2/webviewable/399712.PDF>

[42. Remote Inspection System for Hazardous Sites](http://www.osti.gov/bridge/servlets/purl/348933-Wlq8Td/webviewable/348933.PDF)
<http://www.osti.gov/bridge/servlets/purl/348933-Wlq8Td/webviewable/348933.PDF>

[43. Effectiveness and Environmental Impact of Road Dust Suppressants](http://www.mountain-plains.org/pubs/html/mpc-94-28/)
<http://www.mountain-plains.org/pubs/html/mpc-94-28/>

[44. Rocky Flats Site](http://www.lm.doe.gov/land/sites/co/rocky_flats/rocky.htm) http://www.lm.doe.gov/land/sites/co/rocky_flats/rocky.htm

[45. Modern Strippable Coating Methods](http://www.wmsym.org/abstracts/pdfs/5163.pdf) <http://www.wmsym.org/abstracts/pdfs/5163.pdf>

[46. Joint US/Russian Study on Developing a D&D Strategy Plan at the Leningrad Nuclear Power Plant](http://www.osti.gov/bridge/servlets/purl/1344-QDsu9M/webviewable/1344.PDF) <http://www.osti.gov/bridge/servlets/purl/1344-QDsu9M/webviewable/1344.PDF>

[47. Waste Minimization Handbook, ANL/D&D/TM-96/1](#)

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<http://www.osti.gov/bridge/servlets/purl/219278-toh2H3/webviewable/219278.PDF>

[48. Blade Plunging Cutter http://apps.em.doe.gov/ost/pubs/itsrs/itsr2953.pdf](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2953.pdf)

[49. Advanced Recyclable Media System http://www.osti.gov/bridge/servlets/purl/325770-5cLe9h/webviewable/325770.PDF](http://www.osti.gov/bridge/servlets/purl/325770-5cLe9h/webviewable/325770.PDF)

[50. Airborne Laser Induced Fluorescence Imaging http://www.osti.gov/bridge/servlets/purl/354882-JO4bbv/webviewable/354882.PDF](http://www.osti.gov/bridge/servlets/purl/354882-JO4bbv/webviewable/354882.PDF)

[51. Tests Conducted with Strippable Coatings http://www.osti.gov/bridge/servlets/purl/11008-trO8ph/webviewable/11008.PDF](http://www.osti.gov/bridge/servlets/purl/11008-trO8ph/webviewable/11008.PDF)

[52. ALARA 1146 Strippable Coating http://www.osti.gov/bridge/servlets/purl/750124-Ur2nOG/webviewable/750124.PDF](http://www.osti.gov/bridge/servlets/purl/750124-Ur2nOG/webviewable/750124.PDF)

[53. D&D Technology Integration http://www.osti.gov/bridge/servlets/purl/772494-RJEjTx/webviewable/772494.PDF](http://www.osti.gov/bridge/servlets/purl/772494-RJEjTx/webviewable/772494.PDF)

[54. BOA II, Asbestos Pipe Insulation Removal Robotic System http://apps.em.doe.gov/ost/pubs/itsrs/itsr148.pdf](http://apps.em.doe.gov/ost/pubs/itsrs/itsr148.pdf)

[55. Integrated Vertical & Overhead Decontamination System http://www.osti.gov/bridge/servlets/purl/772496-wweyIa/webviewable/772496.PDF](http://www.osti.gov/bridge/servlets/purl/772496-wweyIa/webviewable/772496.PDF)

[56. Analysis of Potential Concrete Floor Decon Techniques http://www.osti.gov/bridge/servlets/purl/1407-n5vJps/webviewable/1407.PDF](http://www.osti.gov/bridge/servlets/purl/1407-n5vJps/webviewable/1407.PDF)

[57. Evaluation of Coating Removal and Aggressive Surface Removal Surface Techniques Applied to Concrete/Brick Walls and Ceilings http://www.osti.gov/bridge/servlets/purl/873-U1zVmi/webviewable/873.PDF](http://www.osti.gov/bridge/servlets/purl/873-U1zVmi/webviewable/873.PDF)

[58. Concrete Demolition by Electro-Hydraulic Scabbling http://www.osti.gov/bridge/servlets/purl/665900-4UM5g7/webviewable/665900.PDF](http://www.osti.gov/bridge/servlets/purl/665900-4UM5g7/webviewable/665900.PDF)

[59. LTC Vacuum Blast Machine \(concrete\): Baseline Report http://www.osti.gov/bridge/servlets/purl/304013-Z4tvTQ/webviewable/304013.PDF](http://www.osti.gov/bridge/servlets/purl/304013-Z4tvTQ/webviewable/304013.PDF)

[60. Centrifugal Shot Blast System http://www.osti.gov/bridge/servlets/purl/629437-ovRcGb/webviewable/629437.PDF](http://www.osti.gov/bridge/servlets/purl/629437-ovRcGb/webviewable/629437.PDF)

[61. Modified BROKK Demolition Machine with Remotely Operated Console http://apps.em.doe.gov/ost/pubs/itsrs/itsr2938.pdf](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2938.pdf)

[62. Concrete Dust Suppression System](#)

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<http://www.osti.gov/bridge/servlets/purl/7505-8VwK8V/webviewable/7505.PDF>

[63. Concrete Grinder http://www.osti.gov/bridge/servlets/purl/665926-cH4FPf/webviewable/665926.PDF](http://www.osti.gov/bridge/servlets/purl/665926-cH4FPf/webviewable/665926.PDF)

[64. Concrete Spaller http://www.osti.gov/bridge/servlets/purl/335210-9nhkGH/webviewable/](http://www.osti.gov/bridge/servlets/purl/335210-9nhkGH/webviewable/)

[65. Concrete Shaver http://www.osti.gov/bridge/servlets/purl/335211-RDlw5O/webviewable/335211.PDF](http://www.osti.gov/bridge/servlets/purl/335211-RDlw5O/webviewable/335211.PDF)

[66. Copper Cable Recycling Techniques http://apps.em.doe.gov/ost/pubs/itsrs/itsr2958.pdf](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2958.pdf)

[67. Robotic Work Platform for Large Cell Deactivation http://www.osti.gov/bridge/servlets/purl/803646-HrGqaP/webviewable/803646.pdf](http://www.osti.gov/bridge/servlets/purl/803646-HrGqaP/webviewable/803646.pdf)

[68. Dual Arm Work Platform Teleoperated Robotic System http://www.osti.gov/bridge/servlets/purl/325786-9hL5VJ/webviewable/325786.PDF](http://www.osti.gov/bridge/servlets/purl/325786-9hL5VJ/webviewable/325786.PDF)

[69. EnVac Robotic Wall Scabblers http://apps.em.doe.gov/ost/pubs/itsrs/itsr2321.pdf](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2321.pdf)

[70. Self-Contained Pipe Cutting Shear http://www.osti.gov/bridge/servlets/purl/325790-zktnSL/webviewable/325790.PDF](http://www.osti.gov/bridge/servlets/purl/325790-zktnSL/webviewable/325790.PDF)

[71. D&D of Kerr-McGee Cimarron Plutonium Fuel Plant http://www.osti.gov/bridge/servlets/purl/10151437-tEZOv9/native/10151437.PDF](http://www.osti.gov/bridge/servlets/purl/10151437-tEZOv9/native/10151437.PDF)

[72. Field Transportable Beta Spectrometer http://www.osti.gov/bridge/servlets/purl/335209-Y9fjNh/webviewable/335209.PDF](http://www.osti.gov/bridge/servlets/purl/335209-Y9fjNh/webviewable/335209.PDF)

[73. Seal Seam Sack Suit http://www.osti.gov/bridge/servlets/purl/665928-2tB2dJ/webviewable/665928.PDF](http://www.osti.gov/bridge/servlets/purl/665928-2tB2dJ/webviewable/665928.PDF)

[74. Frham Tex II Cool Suit http://www.osti.gov/bridge/servlets/purl/585015-5ezYGb/webviewable/585015.PDF](http://www.osti.gov/bridge/servlets/purl/585015-5ezYGb/webviewable/585015.PDF)

[75. Gamma Ray Imaging System http://www.osti.gov/bridge/servlets/purl/677195-RuUUfx/webviewable/677195.PDF](http://www.osti.gov/bridge/servlets/purl/677195-RuUUfx/webviewable/677195.PDF)

[76. GammaCam Radiation Imaging System http://www.osti.gov/bridge/servlets/purl/629433-GMQ2kd/webviewable/629433.PDF](http://www.osti.gov/bridge/servlets/purl/629433-GMQ2kd/webviewable/629433.PDF)

[77. Remote Methodology used at B Plant Hanford to Map High Radiation/ High Contamination Fields and Document Hazards http://www.osti.gov/bridge/servlets/purl/801106-7ritxp/webviewable/801106.pdf](http://www.osti.gov/bridge/servlets/purl/801106-7ritxp/webviewable/801106.pdf)

[78. Global Positioning Radiometric Scanning System http://apps.em.doe.gov/ost/pubs/itsrs/itsr2954.pdf](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2954.pdf)

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[79. Heat Stress Monitoring System](http://www.osti.gov/bridge/servlets/purl/325788-B2xpDW/webviewable/325788.PDF) <http://www.osti.gov/bridge/servlets/purl/325788-B2xpDW/webviewable/325788.PDF>

[80. High-Speed Clamshell Cutter](http://www.osti.gov/bridge/servlets/purl/665930-C9EMiB/webviewable/665930.PDF) <http://www.osti.gov/bridge/servlets/purl/665930-C9EMiB/webviewable/665930.PDF>

[81. Contamination Control during INsitu Jet Grouting for Application in a Buried Transuranic Waste Site](http://www.wmsym.org/abstracts/2003/pdfs/70.pdf)
<http://www.wmsym.org/abstracts/2003/pdfs/70.pdf>

[82. Insitu Underwater Spectrometer System](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2990.pdf) <http://apps.em.doe.gov/ost/pubs/itsrs/itsr2990.pdf>

[83. Laser Cutting and Size Reduction](http://apps.em.doe.gov/ost/pubs/itsrs/itsr1477.pdf) <http://apps.em.doe.gov/ost/pubs/itsrs/itsr1477.pdf>

[84. Lead TechXtract Chemical Decontamination](http://apps.em.doe.gov/ost/pubs/itsrs/itsr1450.pdf)
<http://apps.em.doe.gov/ost/pubs/itsrs/itsr1450.pdf>

[85. Light Duty Utility Arm](http://www.osti.gov/bridge/servlets/purl/6064-fm2Xx9/webviewable/6064.PDF) <http://www.osti.gov/bridge/servlets/purl/6064-fm2Xx9/webviewable/6064.PDF>

[86. Urethane Foam Void Filling](http://www.osti.gov/bridge/servlets/purl/325792-MHz9JO/webviewable/325792.PDF) <http://www.osti.gov/bridge/servlets/purl/325792-MHz9JO/webviewable/325792.PDF>

[87. Mobile Automated Characterization System](http://www.osti.gov/bridge/servlets/purl/7471-aWn08W/webviewable/7471.PDF)
<http://www.osti.gov/bridge/servlets/purl/7471-aWn08W/webviewable/7471.PDF>

[88. Mobile Integrated Temporary Utility System](http://www.osti.gov/bridge/servlets/purl/335181-hMhKmF/webviewable/335181.PDF)
<http://www.osti.gov/bridge/servlets/purl/335181-hMhKmF/webviewable/335181.PDF>

[89. Mobile Work Platform - A Fluor Fernald Innovative Dismantling Technique](http://www.osti.gov/bridge/servlets/purl/770691-15wgHJ/webviewable/770691.pdf)
<http://www.osti.gov/bridge/servlets/purl/770691-15wgHJ/webviewable/770691.pdf>

[90. Modified Manipulator for Robotic Applications](http://www.osti.gov/bridge/servlets/purl/810614-OtRIgA/native/810614.PDF)
<http://www.osti.gov/bridge/servlets/purl/810614-OtRIgA/native/810614.PDF>

[91. NuFab Anti-Contamination Suit](http://www.osti.gov/bridge/servlets/purl/585026-4uZrcB/webviewable/585026.PDF) <http://www.osti.gov/bridge/servlets/purl/585026-4uZrcB/webviewable/585026.PDF>

[92. Paint Scaler](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2952.pdf) <http://apps.em.doe.gov/ost/pubs/itsrs/itsr2952.pdf>

[93. Personal Ice Cooling System \(PICS\)](http://www.osti.gov/bridge/servlets/purl/325791-aOvoLw/webviewable/325791.PDF) <http://www.osti.gov/bridge/servlets/purl/325791-aOvoLw/webviewable/325791.PDF>

[94. Pipe Cutting and Isolation System](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2093.pdf) <http://apps.em.doe.gov/ost/pubs/itsrs/itsr2093.pdf>

[95. Pipe Explorer Surveying System](http://apps.em.doe.gov/ost/pubs/itsrs/itsr74.pdf) <http://apps.em.doe.gov/ost/pubs/itsrs/itsr74.pdf>

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[96. Pipe Explorer Survey System](http://www.osti.gov/bridge/servlets/purl/10143929-c5Ff76/webviewable/10143929.PDF) <http://www.osti.gov/bridge/servlets/purl/10143929-c5Ff76/webviewable/10143929.PDF>

[97. Pipe Inspection Using BTX-II](http://www.osti.gov/bridge/servlets/purl/354884-XVzGdT/webviewable/354884.PDF) <http://www.osti.gov/bridge/servlets/purl/354884-XVzGdT/webviewable/354884.PDF>

[98. Portable Tritium Cleanup Cart](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2974.pdf) <http://apps.em.doe.gov/ost/pubs/itsrs/itsr2974.pdf>

[99. Portable X-Ray Fluorescent Spectrometer](http://www.osti.gov/bridge/servlets/purl/335207-BqhTwb/webviewable/335207.PDF)
<http://www.osti.gov/bridge/servlets/purl/335207-BqhTwb/webviewable/335207.PDF>

[100. Position Sensitive Radiation Monitoring \(Surface Contamination Monitor\)](http://www.osti.gov/bridge/servlets/purl/10143923-Y0EEIU/webviewable/10143923.PDF)
<http://www.osti.gov/bridge/servlets/purl/10143923-Y0EEIU/webviewable/10143923.PDF>

[101. Gamma Ray Imaging System](http://www.osti.gov/bridge/servlets/purl/325789-gVwyNs/webviewable/) <http://www.osti.gov/bridge/servlets/purl/325789-gVwyNs/webviewable/>

[102. Radioactive Surface Contamination Stabilization](http://www.osti.gov/bridge/servlets/purl/354983-OazCUA/webviewable/354983.PDF)
<http://www.osti.gov/bridge/servlets/purl/354983-OazCUA/webviewable/354983.PDF>

[103. Real-Time Monitoring for Transhumances in Glass](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2004.pdf)
<http://apps.em.doe.gov/ost/pubs/itsrs/itsr2004.pdf>

[104. Remotely Operated Scabbler](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2099.pdf) <http://apps.em.doe.gov/ost/pubs/itsrs/itsr2099.pdf>

[105. Remote Underwater Characterization System](http://www.osti.gov/bridge/servlets/purl/9034-yMkBh6/webviewable/9034.PDF)
<http://www.osti.gov/bridge/servlets/purl/9034-yMkBh6/webviewable/9034.PDF>

[106. Insitu Underwater Gamma Spectrometer System](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2990.pdf)
<http://apps.em.doe.gov/ost/pubs/itsrs/itsr2990.pdf>

[107. Remotely Operated Vehicle for Horizontal Tanks](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2086.pdf)
<http://apps.em.doe.gov/ost/pubs/itsrs/itsr2086.pdf>

[108. Houdini II, Remotely Operated System](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2085.pdf) <http://apps.em.doe.gov/ost/pubs/itsrs/itsr2085.pdf>

[109. Remotely Operated Vehicle with CO2 Blasting](http://www.osti.gov/bridge/servlets/purl/392783-EXVhHg/webviewable/392783.PDF)
<http://www.osti.gov/bridge/servlets/purl/392783-EXVhHg/webviewable/392783.PDF>

[110. RESTRAD-Build, Estimating Dose from Contaminated Structures](http://www.osti.gov/bridge/servlets/purl/350879-EWabP5/webviewable/350879.PDF)
<http://www.osti.gov/bridge/servlets/purl/350879-EWabP5/webviewable/350879.PDF>

[111. Mobile Worksystem \(ROSIE\)](http://www.osti.gov/bridge/servlets/purl/354984-2eVPuH/webviewable/354984.PDF)
<http://www.osti.gov/bridge/servlets/purl/354984-2eVPuH/webviewable/354984.PDF>

[112. Rotary Peening with Captive Shot](http://www.osti.gov/bridge/servlets/purl/629434-67Njel/webviewable/629434.PDF)
<http://www.osti.gov/bridge/servlets/purl/629434-67Njel/webviewable/629434.PDF>

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- [113. Soft Sided Waste Containers](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2240.pdf) <http://apps.em.doe.gov/ost/pubs/itsrs/itsr2240.pdf>
- [114. Steam Vacuum Cleaning](http://www.osti.gov/bridge/servlets/purl/353198-Wf67zo/webviewable/353198.PDF)
<http://www.osti.gov/bridge/servlets/purl/353198-Wf67zo/webviewable/353198.PDF>
- [115. Surface Contamination Monitor & Survey Information Management System](http://www.osti.gov/bridge/servlets/purl/629436-WjVVvQ/webviewable/629436.PDF)
<http://www.osti.gov/bridge/servlets/purl/629436-WjVVvQ/webviewable/629436.PDF>
- [116. Surveillance & Measuring System](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2977.pdf) <http://apps.em.doe.gov/ost/pubs/itsrs/itsr2977.pdf>
- [117. System for Tracking, Remediation, Exposure Activities and Material](http://www.osti.gov/bridge/servlets/purl/665925-Fx6zyY/webviewable/665925.PDF)
<http://www.osti.gov/bridge/servlets/purl/665925-Fx6zyY/webviewable/665925.PDF>
- [118. 2-D Linear Motion System](http://www.osti.gov/bridge/servlets/purl/335215-SFmelh/webviewable/335215.PDF)
<http://www.osti.gov/bridge/servlets/purl/335215-SFmelh/webviewable/335215.PDF>
- [119. Waste Crate & Container Imaging using the Vehicle & Cargo Inspection System](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2912.pdf)
<http://apps.em.doe.gov/ost/pubs/itsrs/itsr2912.pdf>
- [120. Wireless Remote Radiation Monitoring System](http://www.osti.gov/bridge/servlets/purl/10144049-bJOkY2/webviewable/10144049.PDF)
<http://www.osti.gov/bridge/servlets/purl/10144049-bJOkY2/webviewable/10144049.PDF>
- [121. XRF Analysis of PCBs & Inorganics](http://apps.em.doe.gov/ost/pubs/itsrs/itsr2398.pdf) <http://apps.em.doe.gov/ost/pubs/itsrs/itsr2398.pdf>
122. Rocky Flats Cleanup Lessons Learned <http://rockyflats.apps.em.doe.gov/>.
123. DOE EM Featured Reports <http://www.em.doe.gov/pages/FeaturedItems.aspx>