ISMS/EMS Lessons Learned
on Plutonium Disposition Projects at SRS

Presented by:

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Joan Bozzone works for the NNSA Office of Fissile Materials Disposition Office at SRS in the Site Engineering and Project Integration Division. She currently oversees all aspects of environmental and construction permitting and environmental compliance for the plutonium disposition projects at SRS, including the MOX Fuel Fabrication Facility, Pit Disassembly and Conversion Facility, and Waste Solidification Building.

Joan has more than 25 years experience in project management of environmental restoration, cleanup technology research and development, and construction projects in private, commercial, and government settings. She has B.S. and M.S. degrees in geology and is a graduate of the USDA Executive Potential Program Graduate School. She has been nationally licensed as a Registered Environmental Manager, and has held positions as senior geologist, hydrogeologist, and federal project manager for multi-million dollar construction projects. She has overseen development and implementation of environmental restoration projects at more than 10 DOE sites around the country. She served as the DOE Headquarters Environmental Program Manager for the Pantex Plant.

She was the team leader for the Management Systems Evaluation for the multi-billion dollar Pit Disassembly and Conversion Facility project replanning effort, focusing on 413.3 Project Management compliance and Earned Value Management System certification. She assisted in the development of the Environmental Impact Statement and Supplement Analysis for the multi-billion dollar MOX Fuel Fabrication Facility.

In addition to project management, she has 3 years experience in program planning for the Savannah River Site, co-authoring both the national award-winning 2000 SRS Strategic Plan and the SRS Long Range Comprehensive Plan, and recently received an award for development of a new strategic vision for the Savannah River Site.

Her expertise in energy resources includes 5 years’ experience in coal and oil shale research at Exxon Production Research Company and 3 years’ experience in oil exploration for Arco Oil and Gas. She recently served on the Energy Supply Technical Work Group for the South Carolina Climate, Energy, and Commerce Advisory Committee.
Background: Pu Disposition Projects

• DOE will produce mixed plutonium and uranium oxide (MOX) nuclear fuel from excess U.S. weapon grade plutonium resulting from nuclear arms reduction

• Pit Disassembly and Conversion Facility (PDCF) will disassemble weapons “pits” and convert weapon grade plutonium into plutonium oxide feedstock for MOX fuel

• MOX Fuel Fabrication Facility (MFFF) at SRS will turn 34 metric tons of plutonium into nuclear fuel assemblies so that, after irradiation in commercial reactors, plutonium in spent MOX fuel will be unusable for nuclear weapons

• Waste Solidification Building (WSB) will solidify liquid radioactive waste streams from PDCF and MFFF and package it for shipping and disposal
US Surplus Plutonium Disposition Paths

- **Arms Reduction Agreements**
  - Weapons Dismantlement at Pantex
  - Plutonium Pits
  - Interim Storage at Pantex

- **Non-Pit Plutonium Stored at SRS**
  - Clean Metal
  - Impure Plutonium Oxide*

- **New SRS Facility**
  - Liquid Waste

- **New SRS Facility**
  - Liquid Waste
  - Low-level effluent treatment
  - Geologic Repository

- **MOX Nuclear Fuel Assemblies**
  - Burn in Existing, Domestic Commercial Reactors

*Non MOX-able surplus weapon-grade plutonium will be disposed of by DOE’s Office of Environmental Management*
SRS is a large EM site in South Carolina.

NNSA Office of Fissile Materials Disposition, a tenant on the EM site, is building three new projects in F Area.

Integration of NNSA construction activities into:

- SRS infrastructure
- Established regulator relationships, agreements, and permits
- SRS site-level permits

Complex physical, regulatory, and legal interfaces exist between:

- Projects (MFFF-PDCF-WSB)
- DOE (NNSA/NN-NNSA/DP-DOE/EM)
- Contractors (MOX Services-SRNS-URS-USACE-SRR)
- Regulators (EPA-DHEC-NRC-OSHA-DOE)
Complexity of Pu Projects in F Area

Waste Solidification Building
- Designed and constructed by Savannah River Nuclear Solutions, the SRS M&O contractor
- Permitted as an Industrial Wastewater Treatment facility

Physical connection between projects and with SRS processing facility

MOX Fuel Fabrication Facility
- Designed and constructed by Shaw AREVA MOX Services
- Licensed by Nuclear Regulatory Commission
- Regulated by OSHA

Currently 65 site-level, state and federal permits on MFFF project alone

Pit Disassembly and Conversion Facility
- Designed by URS Washington Group
- Construction management by U.S. Army Corps of Engineers
- Classified operations
MFFF Environmental Features

- Brownfield locations
- Pollution prevention design with zero liquid effluents
- Waste minimization throughout construction and operations
- Subcontractor and employee training in environmental management and energy efficiency
- Ongoing environmental monitoring by Savannah River Ecology Lab

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Lessons Learned:

• Develop construction and permitting teams’ working relationship and processes

• Foster and protect “SRS delegated authority” and the permitting teams’ relationship

• Provide practical environmental training for managers, employees, and subcontractors

• Remind workers about permitting in meetings and on the job
MOX Environmental Management

Temporary energy saving office facilities

Employee “Commitment Wall”

Segregating/recycling construction waste

Avoiding permit infractions

Communicating conservation

Environmental design and promotion
Minor permit condition was overlooked:

"Within one year of construction permit issue, notify regulators if construction has started."

If notification had not been received, then the construction permit would have been cancelled in two days, and work would have stopped until a new permit could be issued.

Situation:

- Project is shown almost one year after construction permit was issued.
- ~450 construction workers on site.
- 4 cranes working.
- 2 concrete batch plants active.

Lessons Learned:

- Put minor, but important, permit conditions on integrated project schedules so they aren’t forgotten.
- Communicate openly with regulators and keep them apprised of field activity status.
- Encourage working relationships between contractor groups.
LEED Certification

Underground rainwater collection tank for irrigation

Signing Ceremony on Earth Day
Effluent Treatment Project Lift Station

Situation:
Industrial Wastewater Treatment Permit application didn’t include PDCF and MFFF lines to WSB.
MOX contractor was not aware of IWT permit conditions limiting procurement of materials prior to permitting.

Lessons Learned:
• Hold regular, structured integration meetings between the different projects’ environmental teams to make sure each project is aware of the others’ permitting actions.
• Coordinate communication with regulators through SRS site environmental team.
• Actively participate on the Savannah River Integration Team comprised of environmental managers from SRS, EPA, and State.
• Assign a designated integrator from the M&O to facilitate regulatory communication and dispute resolution.

Project Permitting Lessons Learned #3
**ISMS in Environmental Permitting**

- Design features into the facility to minimize permit requirements
- Insure that permit requirements flow down to subcontractors
- Schedule and facilitate joint communication with environmental management stakeholder teams
- Develop work plans to minimize permit requirements
- Include permit requirements in interfaces and regulations
- Identify key players in environmental permit development and implementation
- Carefully assess interfaces and determine optimal permitting strategies for overall program success
- Evaluate proposed permitting against existing permits
- Coordinate draft permits with other environmental teams
- Design features into the facility to minimize permit requirements
- Insure that permit requirements flow down to subcontractors
- Schedule and facilitate joint communication with environmental management stakeholder teams
- Spend time on the jobsite to know what the contractors are doing in the field
- Regularly monitor contractor environmental performance and flowdown to subcontractors
- Incentivize environmental performance
- Maintain communication with regulators on project status
- Track progress on meeting environmental goals
- Track construction activities with environmental responsibilities
- Schedule and facilitate joint communication with environmental management stakeholder teams
- Insure that permit requirements flow down to subcontractors
- Design features into the facility to minimize permit requirements
- KEEP PERMITTING ACTIVITIES OFF OF THE PROJECT CRITICAL PATH!!!
Lessons Learned in Project Permitting
Show the Importance of ISMS/EMS!

Define Scope of Work

Feedback and Improvement

ISMS/EMS

Analyze Hazards

Perform Work Safely

Develop and Implement Controls