



U.S. DEPARTMENT OF
ENERGY



DOE-EM's Technology Innovation & Development Program

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Director

Waste Management Symposia
March 7-11, 2010



EM *Environmental Management*

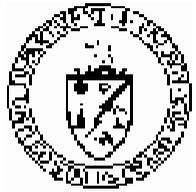
safety ❖ performance ❖ cleanup ❖ closure

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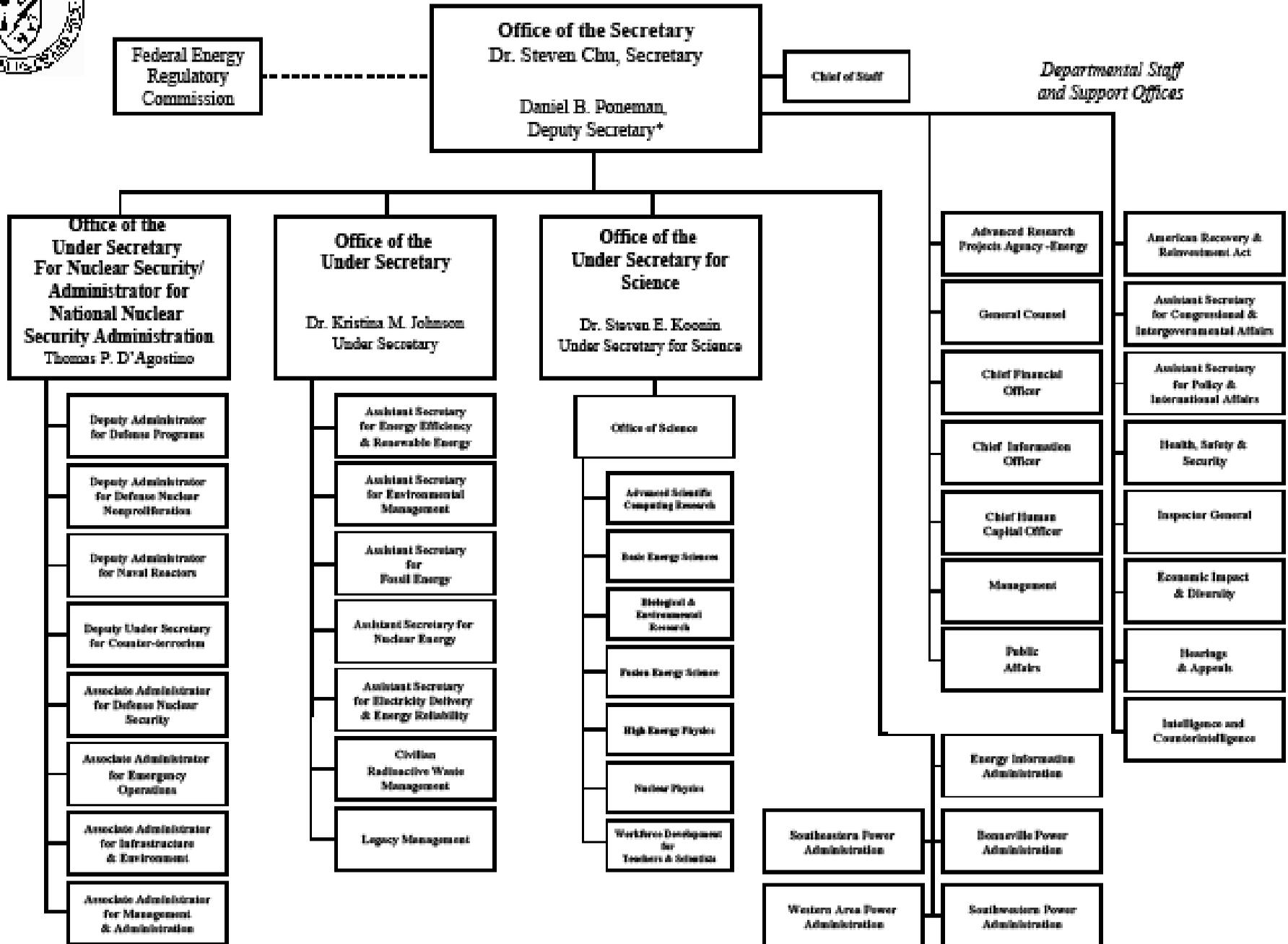
Changes in EM's Organization

- **Office of Technology Innovation and Development (TI&D) reports to new Technical Officer**
- **TI&D includes the Office of Nuclear Materials and Disposition**
- **Focus is on the use of R&D to develop transformational solutions in all areas**

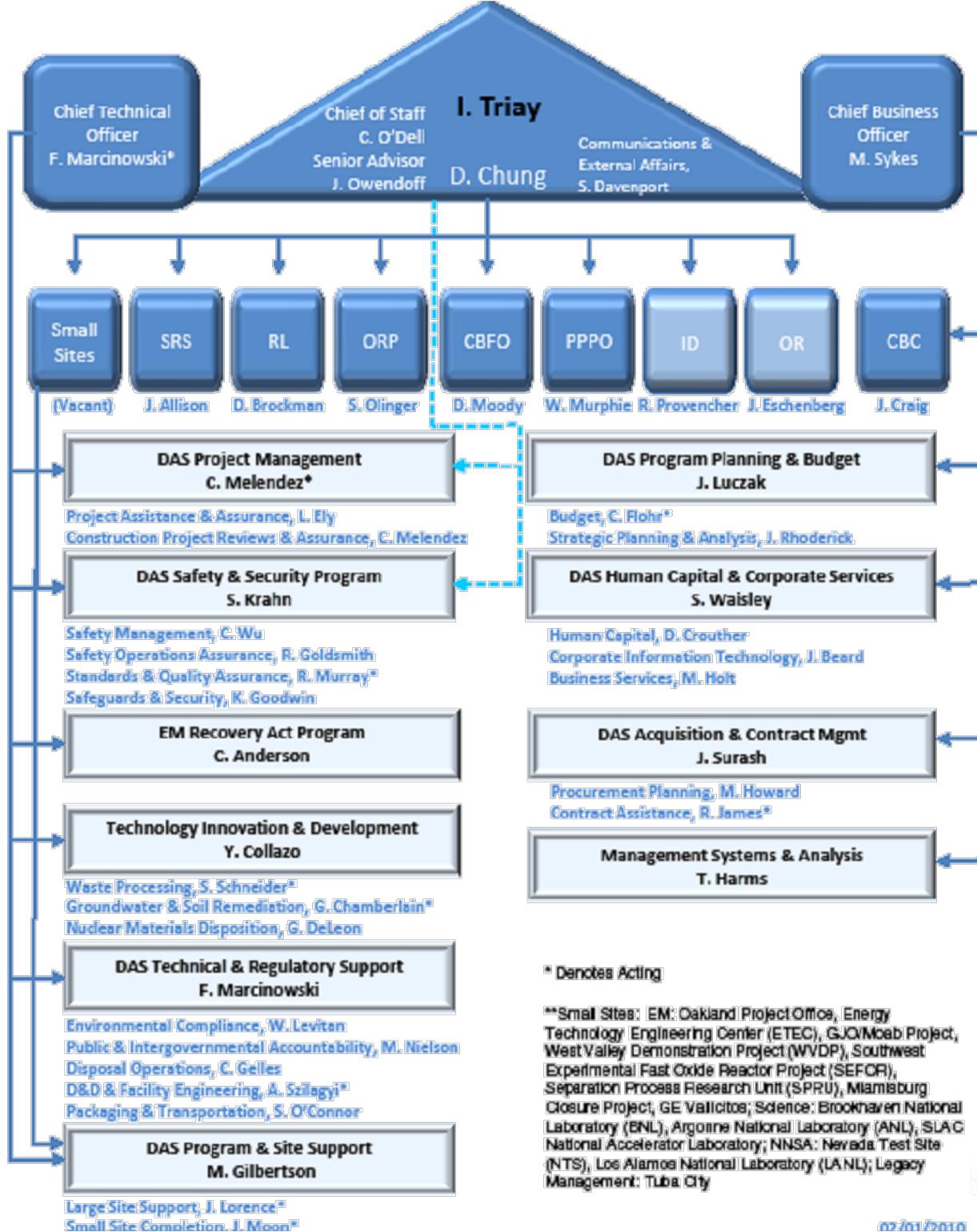




DEPARTMENT OF ENERGY



* The Deputy Secretary also serves as the Chief Operating Officer



EM Mission

“Complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development, production, and Government-sponsored nuclear energy research.”



- Largest environmental cleanup effort in the world *originally* involving 2 million acres at 108 sites in 35 states
- Operating in the world’s most complex nuclear waste regulatory system
- Safely performing work in challenging environments involving some of the most dangerous materials known to man
- Solving highly complex technical problems with transformational technologies
- Supporting other continuing DOE missions and stakeholder partnerships



EM Environmental Management

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EM Top-Level Goals

- **Safety**
 - Ensure the safety and health of the public and the workers and protect the environment
- **Compliance and cleanup scope**
 - Perform work in accordance with 37 compliance agreements with state and federal regulatory agencies
- **Project Management**
 - Improve construction project performance
- **Footprint Reduction**
 - Reduce the active area and number of sites
- **Science and Technology**
 - Use science and technology development to decrease the life cycle cost and period of execution of the EM program



Office of Technology Innovation & Development

Program Strategy

➤ Integrated Transformational Applied R&D

- Integrate R&D results with site plans to improve baselines by reducing costs and/or shortening schedules

➤ Leveraging

- Partner with national laboratories, universities, DOE and Federal agency counterparts, international colleagues, contractors, regulators, and stakeholders

➤ Communication

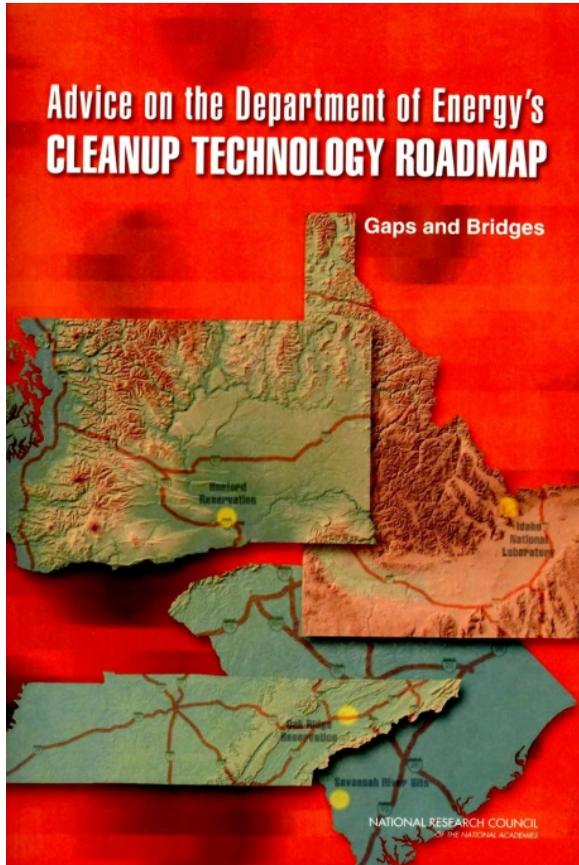
- Communicate technical solutions across DOE sites and the worldwide nuclear cleanup community

➤ Technical Assistance Peer Reviews

- Evaluation of technical maturity & risk, provide technical assistance to sites to resolve issues and conduct peer reviews



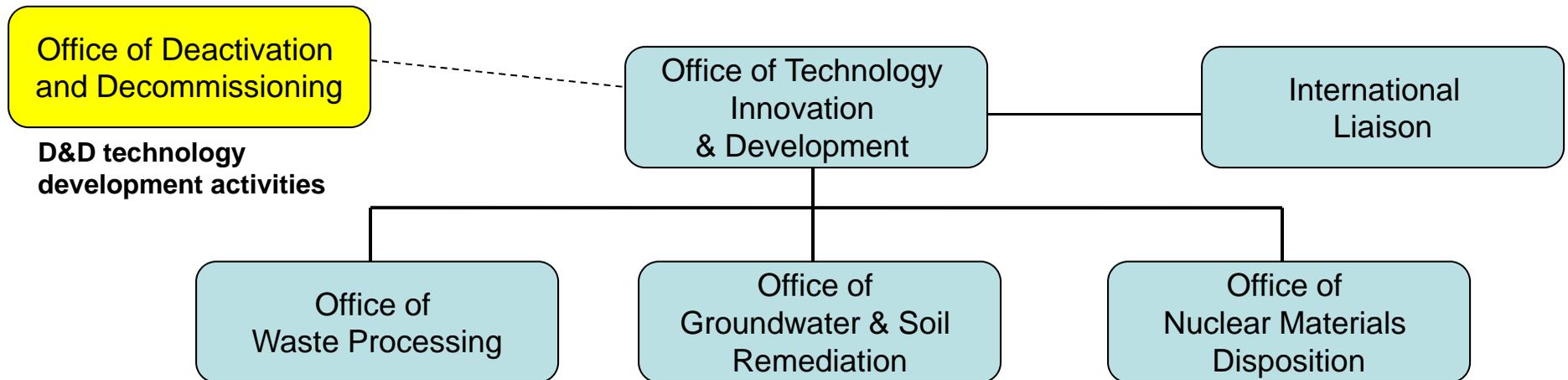
National Academy of Science (NAS) Study



- DOE-EM commissioned NAS study in 2007
- In 2009, NAS published: “*Advice on the Department of Energy’s Cleanup Technology Roadmap, Gaps and Bridges*”
- NAS recommended that DOE EM focus technology development work on:
 - Waste Processing
 - Groundwater and Soil Remediation
 - Spent Nuclear Fuel and Surplus Nuclear Material
 - Facility Deactivation and Decommissioning
- DOE EM restructured the technology development program to focus on *transformational* technologies in the program areas identified in the NAS study



Office of Technology Innovation & Development



Mission

Develop transformational technologies and strategies through partnerships to solve EM's clean-up challenges

Vision

To vastly improve the EM baseline by developing and facilitating the timely insertion of transformational technologies



EM Environmental Management

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Office of Technology Innovation & Development International Liaison

Goals

- **Identify waste management, soil and groundwater, D&D, and SNF/SNM challenges of mutual concern**
- **Continue international cooperation that has produced tangible results in the cleanup efforts**
- **Leverage International expertise and experience**
- **Continue highly beneficial relationships with leading international scientists that contribute to transformational technology innovation and development**



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Office of Technology Innovation & Development

Office of Waste Processing

Areas of Focus

- **Waste Retrieval and Closure Technologies**
- **Alternative Waste Pretreatment**
- **Advanced Unit Operations and Scaling**
- **Improved Vitrification Capacity**
- **Increased Waste Loadings**



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Office of Soil and Groundwater Remediation

Areas of Focus

- **Advanced Subsurface Computing for Environmental Modeling (ASCEM)**
- **Mercury Remediation**
- **Demo Method to Reduce Transport of Chlorinated Organics through the Vadose Zone**
- **In Situ Treatment of Metals and Rads**
- **MNA of Metals and Rads**
- **Enhanced Attenuation of Chlorinated Solvents**



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Areas of Focus

- **Adapted Technologies for Equipment Removal and Dismantlement**
- **Conceptual Design of a Remote Off-gas Stack Characterization System**
- **Large, Highly Contaminated Structures & Equipment/Hot Cell Characterization and D&D**
- **In-Situ Decommissioning Technology Development & Demonstration**



Office of Technology Innovation & Development

Office of Nuclear Materials Disposition

Areas of Focus

- Ensure the safe management and disposal of surplus nuclear material such as: plutonium, spent nuclear fuel, highly enriched uranium, and other surplus material
- Perform life-cycle cost alternatives analysis
- Develop strategic documents that provide an acceptable disposition path in coordination with other DOE Program Offices
- Invest in R&D to solve tough challenges



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Summary

- Transition to *transformational* technology focus aligned with NAS-identified technology gaps
- Expand TI&D program to pursue additional NAS gap areas including Nuclear Materials Disposition needs
- Expand Continue international program coordination to include all focus areas
- Focus on integration, collaboration, communication, and peer reviews





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