

Emergency Response Drills and Biosafety

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Select Agents and Toxins in the DOE complex

- Work for DOE, DoD, other customers has been performed across the complex
- 2001 stimulated transition of work from defense and IC to homeland security mission
- No BSL-3 or -4 labs operational yet in the DOE complex
- 42 CFR 73 (final rule 3/18/05) requires annual drills or exercises and explicit incident response plan (9 CFR 121 for agricultural agents)
- Incident response, security, and biosafety plans are inter-related
- DOE O 151.1c adds additional requirements for emergency preparedness specifically relating to select agents and toxins

Category A

- *Can be easily disseminated or transmitted person-to-person*
- *Cause high mortality, potential for major public health impact*
- *Might cause public panic*
- *Requires special action for public health preparedness*

Agents

- *Variola major (smallpox)*
- *Bacillus anthracis (anthrax)*
- *Yersinia pestis (plague)*
- *Clostridium botulinum toxin (botulism)*
- *filoviruses*
 - *Ebola hemorrhagic fever*
 - *Marburg hemorrhagic fever*
- *arenaviruses*
 - *Lassa (Lassa fever)*
 - *Junin (Argentine hemorrhagic fever) and related viruses*

Category B

- *Moderately easily to disseminate*
- *Cause moderate mortality, and low morbidity*
- *Require specific enhancements of CDC's diagnostic capability and enhanced disease surveillance*

Agents (includes, but is not limited to)

- *Coxiella burnetti (Q fever)*
- *Brucella species (brucellosis)*
- *Burkholderia mallei (glanders)*
- *Alphaviruses*
 - *Venezuelan encephalomyelitis*
 - *eastern and western equine encephalomyelitis*
- *Ricin toxins from Ricinus communis (castor beans)*
- *epsilon toxin of Clostridium perfringens*
- *Staphylococcus enterotoxin B*
- *Salmonella species*
- *Shigella dysenteriae*
- *E. coli O157:H7*
- *Vibrio cholerae*
- *Cryptosporidium parvum*

Select Agent and Toxin Work at the INL Research Center

- **Currently involves infectious samples and live cultures of *Brucella spp***
- **Has involved analysis of suspect samples (other biothreat agents including *B. anthracis*) and may involve other agents in future**
- **Funding provided by DHS today, but programs have involved select agent use since 1996**
- **Select agent rules have applied to our work since OIG inspection in 1999**
- **Biosafety and security measures in place to protect workers and the public, using engineered controls, good microbiological practices, training, access controls, inventory control**

Brucella abortus

- ❖ **Causative agent of brucellosis**
 - ❖ **Abortions, reduced fertility, reduced milk production**
- ❖ **Present in the bison and elk populations in Yellowstone**
- ❖ **Of concern due to potential transmission to cattle**
- ❖ ***Brucella spp* have been developed as biological warfare agents**



Incident response plans, drills, and exercises

- **CDC stated to us “it would be counterproductive to attempt to prescribe a single detailed list of requirements that must be included...(!)”**
- **First challenge is coordinating with site emergency response experts**
- **Decision on what type of drill or exercise to conduct (tabletop exercise always easier!)**
- **Tailoring exercise scenarios – draft EMG for biosafety facilities provides useful table of potential scenarios that can be adapted for each facility (Appendix A)**
- **Support of an experienced emergency planner and other emergency management staff is VERY helpful**
- **Understanding terms and concepts in biosafety is important**

Tabletop Exercise Planning

- **A need to understand the context of a biosafety emergency in overall emergency response at DOE facilities**
- **Laboratory procedures end at point of declaring an emergency**
- **Projecting what happens next is not trivial, but beyond special requirements necessary for containment of viable contaminants, should still be considered in the framework of general emergencies**
- **42 CFR 73 and infectious nature of contaminants that could be released requires briefing first responders and understanding their procedures, and preplanning for participation by public health officials**

INL's Tabletop Exercise 2006

- **3 scenarios exercised in 2 hours**
- **Participants included lab staff, facility engineers, first responders, management, emergency management, and public health**
- **Scenario 1 – spill in containment**
- **Scenario 2 – spill outside containment**
- **Scenario 3 – spill involving collapse of lab worker and potential medical emergency**

Lessons Learned

- **No reasonable plume model to assist in decision of how far to evacuate personnel and the public**
- **HVAC control to isolate potential release is desirable – how to achieve it**
- **Separate evacuation zones may be necessary for potentially contaminated/exposed personnel – similar to evacuation from rad areas; also may be special needs for transport to hospital**
- **Off-hours versus business day events may be handled differently due to availability of SMEs**
- **Access to select agent labs is controlled by regulation – means for first responders to enter lab if necessary**
- **Decon requirements should be made known ahead of time**
- **Haz-mat teams appear ready to deal with biological incidents**