International
BIOLOGICAL THREAT REDUCTION

Incident Response

Laboratory Biosecurity and Biosafety
For BSL3 Laboratories
India
January 2007

SAND No. 2006-1996C
Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company,
for the United States Department of Energy's National Nuclear Security Administration
under contract DE-AC04-94AL85000.

Sandia National Laboratories

Incidents Are Not Necessarily Emergencies

- Incident
  - An event that's likely to have adverse consequences
- Emergency
  - Unanticipated circumstances resulting in need for immediate action

- Examples of Incidents and Emergencies
  - Natural Disasters
  - Infrastructure Disruptions
  - Accidents
    - Release from Containment
    - Spills
  - Medical
    - Exposures
    - Injuries
    - Illnesses
  - Intentional
    - Security breaches
    - Agent theft
    - Agent release
    - Bomb threats

Incident Management

- Prepare
  - Risk assessment
  - Risk mitigation
    - Planning
    - Integration with facility plans
  - Coordination with local responders
  - Training & drills
- Respond
- Recover
- Report and Review

Chance favors only the prepared mind

--Louis Pasteur, 1854

Why Incident Management?

- Tool to prevent incidents
  - Preplanning
  - Anticipate incidents
  - Implement preventive measures
- Enhance ability to respond to incidents
  - Know what to do
  - Minimize panic
- Attempt to minimize loss or injury
- Enhance ability to recover from incidents

Risk and Vulnerability Assessment

- **Risk assessment**
  - **Determine likelihood and potential consequences of incident**
- **Determine planning and resource prioritization**

Incident	Probability High=5 Low=1	Human Impact	Facility Impact	Internal Resources	External Resources	Total
		← Impact Potential →		← 1 (strong)	5(weak) →	
Infectious agent Spill	4	4	4	1	4	17
Tornado	1	2	2	1	1	7

Impact Potential: cost of replacement
High=5
Low=1
Total: Lower numbers are better

FEMA Emergency Management Guide for Business and Industry

Risk Mitigation

- **Mitigation**
  - To make less severe or intense (www.dictionary.com)

- **Example: severe weather**
  - No way to alter <u>probability</u>
  - Must alter <u>magnitude</u> by controls
    - Structures designed to withstand winds and with consideration of possible flooding
    - Back-up power
    - “Stand-down” procedures during threat
    - Pre-planned responses
    - Multiple-layer response team

Incident Response Plan

- Policies and procedures for managing all incidents
  - "What and How" of managing an incident
- Based on facility needs and applicable regulations
- Foundation of procedures for protection
  - Employees
  - Facility
  - Community

Components of an Incident Response Plan

- Establish authority
  - Biosafety officer / responsible official
  - Safety officer
  - Fire chief
  - Local police / on-site security
- Names and contact information
- Policies and procedures
  - Theft of agent/ unauthorized access
  - Evacuation
  - Equipment shut down procedures
  - Evacuation from high containment area
  - Medical treatment
  - Accidental spill
    - Protective equipment
    - Clean-up (decontamination)

Steps in Building the Plan: Research

- Establish who will participate in writing the documents
  - Biosafety/Safety Officers
  - Lab managers
  - Security
  - Local emergency agencies
- Compile resource information
  - Existing plans
  - Applicable national and local regulations and guidance
  - Special needs
  - Facility Maps
  - Internal and external capabilities
- Risk Assessment
  - Identify hazards and locations
  - Consider consequences
  - Prioritize risks
- Vulnerability Assessment
  - Establish weaknesses
  - Identify strengths

International
BIOLOGICAL THREAT REDUCTION

Steps in Building the Plan: Development

- Develop
  - Identify potential incidents and likely scenarios
  - Establish policies/procedures for mitigation
- Review and validate
  - Adequately mitigate the incidents
  - Ensure it meets all necessary regulatory requirements
- Test the plan: identify weaknesses
  - Tabletop exercises
  - Scenarios
- Implement
  - Training
  - Drills/full scale exercises annually
  - Self assessments
- Maintain
  - Review annually and after any incidents
  - Revise as needed
  - Add new plans as needed

Considerations

- Plan for all possible contingencies
  - Inception to termination
  - Minor incidents to major catastrophes
- Take advantage of existing plans
- Use a team approach
- Common terminology
- Resources for assistance
  - Government agencies
  - Emergency response personnel
  - Hospitals
- Training
  - Roles
  - Responsibilities
  - Policies
  - Procedures
  - Familiarity with facility
- Memorandum of understanding
- Authority:
  - BSO
  - Lab Manager
  - NIMS, NRP
- Media
  - Use to your advantage
  - Control information to media
- Have a backup plan

Planning

- **Define roles and responsibilities for potential incidents**

Responsibility	Contact Info		
Spill Coordinator	**Extension**	**Pager**	**Home PH**
Spill Team Lead			
Spill Primary Responder			
Spill Secondary Responder			
Safety Responder			

Internal Planning

What to do when:

Problem	Indication	What to do
Laboratory is not within pressure specifications	Pressure monitor has red light and is alarming	***If you are outside the lab:*** Wait a few minutes with no doors opening to see if the alarm will go away. If it doesn't, DO NOT ENTER the laboratory and DO NOT attempt to re-set the pressure monitor. Call Delta at 2-2041 and report that the pressure monitor for the room (state the room number) is alarming. Report the alarm to the Facility Manager or the BSO. Wait for authorization from Facility Manager or BSO before entering the lab. ***If you are inside the lab***: Wait a few minutes with no doors opening to see if the alarm will go away. If it doesn't, exit the laboratory and remove your PPE according to standard procedures. Wash hands. Call Delta at 2-2041 and report that the pressure monitor for the room (state the room number) is alarming. Report the alarm to the Facility Manager or the BSO. Wait for authorization from Facility Manager or BSO before entering the lab.
Biological safety cabinet (BSC) is in alarm	BSC alarm sounds	**Work in the malfunctioning BSC must stop immediately.** Secure all materials, decontaminate the containers and remove them from the BSC. Wipe down the BSC according to standard procedures. Report the alarm to the Facility Manager. No work may proceed in the malfunctioning BSC until cleared by the Facility Manager. An accredited field certifier (e.g., ENV Services) must conduct any repairs on the BSC.
BSL3 lab ventilation goes down	Blue light near entry is flashing. An audible alarm may also sound.	**All work in the laboratory must stop. All personnel must exit.** Quickly contain any infectious materials by replacing caps and/or covers. Exit to the anteroom. Remove PPE in anteroom Wash hands. Call Delta at 2-2041 and report that the ventilation alarm for the room (state the room number) is alarming. Report the alarm to the Facility Manager or the BSO. Do not re-enter laboratory without authorization from Facility Manager or Biological Safety Officer.

Coordinating with Local Responders

- Determine the potential responders
  - Fire, law enforcement, hazardous materials team, bomb squad, local terrorism response coordinators, emergency medical services, hospitals, infectious disease physicians
- Awareness training
  - Building maps and access protocols
  - Fire alarm and monitoring systems
  - Hazardous materials awareness (chemical, radiological, biological)
  - Emergency procedures
  - Tour
- Memorandum of Agreement
  - Understanding of the hazards
  - Agreed upon response time
  - Understand internal response at facility
  - Training
  - Points of contact
  - Agreement to review periodically and

Accidental Spill Scenario: R.A.I.N. Concept

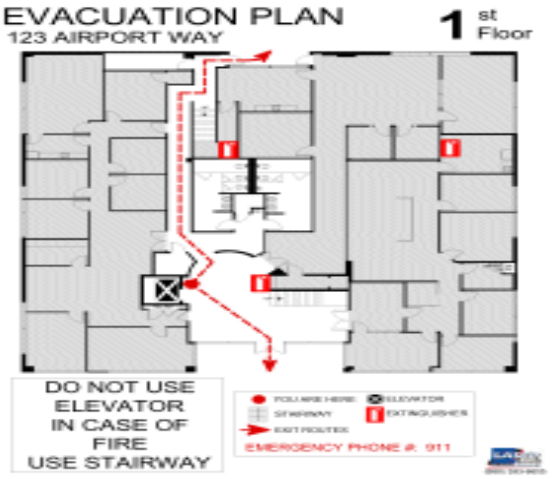
- Recognize
- Avoid and Alert
- Isolate
  - Close doors
  - Cover with bleach-soaked towel
- Notify
  - Biosafety officer
  - Lab Manager

- Mitigate
- Terminate
- Recover

Accidental Spill

Incident: Spill

- R.A.I.N.
- Evacuate the area



Mitigation:

PPE

Decon

Medical evaluation

Biological Spill Kits

- Commercial kits available
- "DIY" – do it yourself
  - Small disposable broom with dustpan, tongs or forceps
  - Biohazard waste bags
  - Disinfectant agent suitable for the agents in the lab
  - Paper towels or other absorbent material
  - Dike material or spill pillows for large spills
  - Spill control and cleanup procedures
  - Sharps container
  - Warning signs
  - Storage container

Example Building Evacuation Protocol

- Shut down equipment
  - Have an established protocol
- Take personal belongings
  - Only if close by
- Close doors
- Exit lab
- Motivate to nearest exit
- Avoid elevators for fire
- Exit the building
- Assemble at predetermined location
- Accountability
- Someone must be in charge
- Wait until “All Clear”
  - Who determines “All clear”?
  - Who is the facility liaison to receive the “all clear”?
  - How is this communicated to personnel?

Unauthorized Individual in Area

- Preplan and train to implement measures prior to occurrence
- Facility personnel must be able to recognize unauthorized individuals
- Train personnel on appropriate response
  - If non-threatening, approach person and ask if they need assistance or directions?
  - If threatening, avoid and call security
- If evacuation is appropriate and there is time
  - Isolate the area first
    - Don't leave experiments on the bench
    - Lock doors, freezer, etc
- Notify appropriate personnel
  - Security
  - BSO
  - Lab manager
  - Police
  - Other agencies as needed
  - Community?
    - Media

U.S. Regulations and Guidance

- **HSPD-5**
  - **NIMS**
  - **NRP**
- **HSPD10**
  - **Biological annex**
  - **Encourages consistency with NRP**
- **Chemical Agents**
  - **Resource Conservation and Recovery Act (RCRA) of 1976**
  - **Superfund Ammendments and Recovery Act (SARA) of 1986**
  - **HAZWOPER (29 CFR 1910.120)**
  - **HazMat Transportation Regulations**
- **Biological Agents**
  - **42CFR 73**
    - **OSHA 29CFR1910.1200 and 1910.1450**
    - **NIH Guidelines for rDNA**
  - **BMBL: Lab Security and Emergency Response: Guidance for labs working with select agents**

  - **See CD for Guidelines**

Conclusions

- **Risk Assessment (again!)**
- **Risk mitigation**
- **Pre-plan: procedures and personnel**
- **Integration with facility plans**
- **Cooperation with local responders**
- **Training & drills**
- ***Response, report, and review***

References

- FEMA Emergency Management Guide for Business and Industry
- FEMA State and Local Guide: Guide for All-Hazard Emergency Operations Planning (SLG 101)
- Hazardous Materials: Managing the Incident, 3rd edition, Noll, Hildebrand and Yvorra
- 42 CFR 73

  - See CD for Guidelines