

CAN I PUSH YOU OFF A LADDER TOMORROW?

RESCUE DRILLS IN A CONTAINMENT FACILITY

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BioContainment Pilot Plant

- Designed to hold pilot-scale food processing equipment
- Containment lab
- 18’ (5.5 m) ceiling
- 1200 ft^2

BioContainment Pilot Plant

- Building is BSL-3
  - Directional airflow
    - HEPA-filtered exhaust
  - Drains go to decontamination tank
  - Pass-through autoclave
  - Sealed penetrations
- People are in BSL-4 full-body suits
  - Clean breathing air
  - Shower out

BioContainment Pilot Plant

- Normal BSL-3 hazards
  - Infectious agents
  - Biological toxins
  - Select Agents
  - Aerosols

BioContainment Pilot Plant

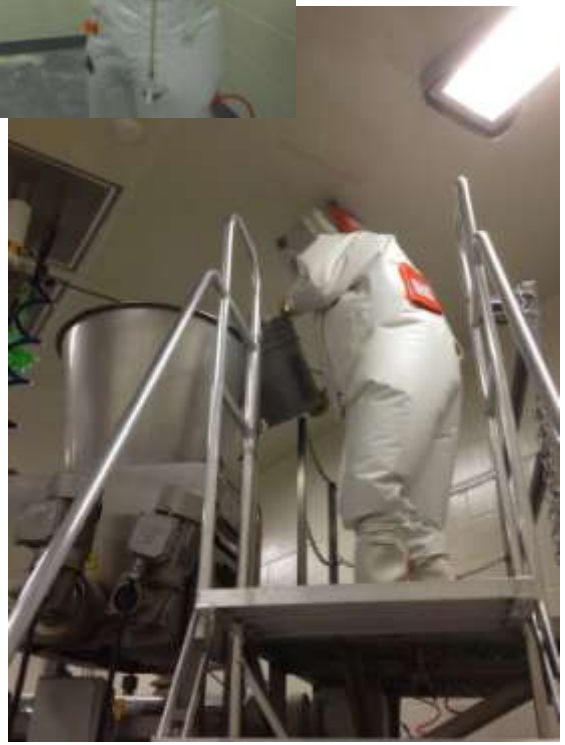
- Normal pilot plant hazards
  - Large equipment
  - Moving equipment
  - Noise
  - Ladders/stepstools
  - Heavy loads
  - Slip/trip/fall
    - Oily floors
  - Electrical shock
  - Heat/steam lines

BioContainment Pilot Plant

- Combination BSL-3 and pilot plant
- Unique hazard set
  - LOTO- no pockets?
  - HEPA filters don't like flour
  - Contaminated food-grade oil in shoe treads
- Must keep personnel safe while doing heavy, dirty, difficult work

Potential Injuries

- Laboratory
  - Inhalation if suit rips
  - Puncture wound
- Pilot Plant
  - Fall
    - From height
    - Awkward slip- hard to move in suit
  - Person trapped in equipment



Have Plan, Will Drill

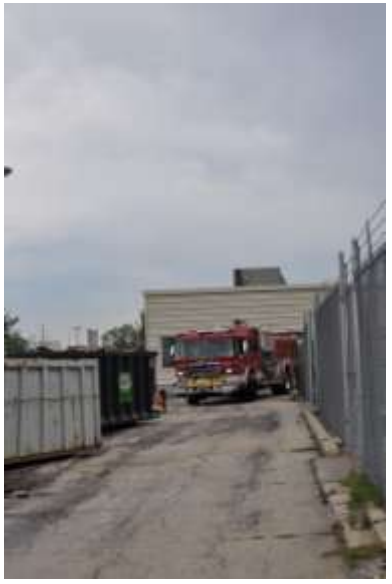
- Don’t enter if sick, skin opening
- Emergency exit procedures for injured person
  - How to exit, how to decontaminate
- What happens to unconscious, trapped person?

Training First Responders

- Invited on tour of clean facility
- Visited annually, to talk about what we do
- Offered walk-through

Does Policy Work in Practice?

- Who calls for help?
- Can fire trucks get around tight corners?
- Who opens the gate?
- Who opens the door?
- How clean can the lab be?
- Time for a real drill!



Trapped Limb

- Scenario: while working with 600 gallons of anthrax in processing water, a worker's arm or leg gets trapped in the equipment

Following the Plan

- The observer called for help
  - Used facilities radio, which is heard by security and facilities
- Security called 911
  - And therefore knew where to send the ambulance
- Facilities opened gate, safety officer present

- Uninjured personnel sanitized the equipment passthrough
- Fire Department willing to enter building
- Entered via equipment passthrough
- Brought equipment in and out
- Set up and used their own decontamination station

- Person in the passthrough could provide information
  - Where is injured person?
  - What is safe to touch?
  - What are hazards?

Equipment and people could come in

As necessary.

Some surprising things:

First responders like to look things over before acting.

And they care
(more than you might think).

They are not concerned about survival of your experiment

But they will do a lot to get you out alive.

Lessons Learned

- Have 10-15 minutes between time of call and fire department on-site
  - Use time to clean injured person
  - Make “bleach path”- clean path on floor
  - Observer makes call to pull extra people out of room
- Fire departments have different responses not only between departments, but between shifts

Lessons Learned

- Fire Department personnel have many good suggestions
  - "Emergency kit" now in passthrough
  - Creating "whips" that will allow them to hook to our breathing air

Lessons Learned

- Very hard to communicate between suited personnel and first responders
- Both are wearing hearing protection/communication devices

Lessons Learned

- Difficulty in accurate training, because we wouldn’t let suits be destroyed

Next Year: Fall From a Ladder

- Scenario: person working on 12’ (3.7 m) ladder falls, is unresponsive. Has been working with 600 gal (2300 L) water with dissolved ricin.

First part went fine

- Observer called for help
- Uninjured personnel immediately began decontaminating pass-through and path

Decontaminated injured person

- Just keep the hose running!

Then we hit a snag

- First responders got tunnel vision with the word “ricin.”
- Assumed IDLH, didn’t talk to safety officer
- Grabbed victim and exited

- Not optimal
  - Spinal injuries?
  - Glow powder!

So try again.

- Next day, the safety officer was more proactive, grabbed first responders before they could enter

First responders used a backboard

Took the injured person to the (clean) passthrough

Where they could remove her suit

And bring her out.

Then they could decontaminate their turnout gear

Lessons Learned- First Responders

- Can get tunnel vision
- May have to grab someone to tell them the info they need
- Don’t always understand door signs
  - Made several suggestions for easier-to-understand signage

Lessons Learned

- We need to be better about sending a ride-along with the injured person
- Created emergency medical history packets

Lessons Learned- Lab Personnel

- Some participate with more enthusiasm than others
- Reported increased confidence
  - Both in their ability to respond, and in the FD
- Requested additional drills
  - Realize these were worst-case scenarios, wanted to drill “more likely” scenarios

Summary

- Our plan calls for close communication between first responders and BSL-3 personnel
- First responders very willing to enter lab, sometimes forget to ask what's in there
- Lab personnel have 10-15 minutes to prepare before first responders enter
- Drills resulted in increased confidence, improved protocols

Thanks!

- The laboratory personnel

- The first responders

Questions?