ABSA 52nd Annual Conference, Miami, Florida, October 18-21, 2009
Session XIV: ROUND TABLE: Inactivation and Decontamination

Vaporized Hydrogen Peroxide Decontamination of Two Specialized Animal Transport Units

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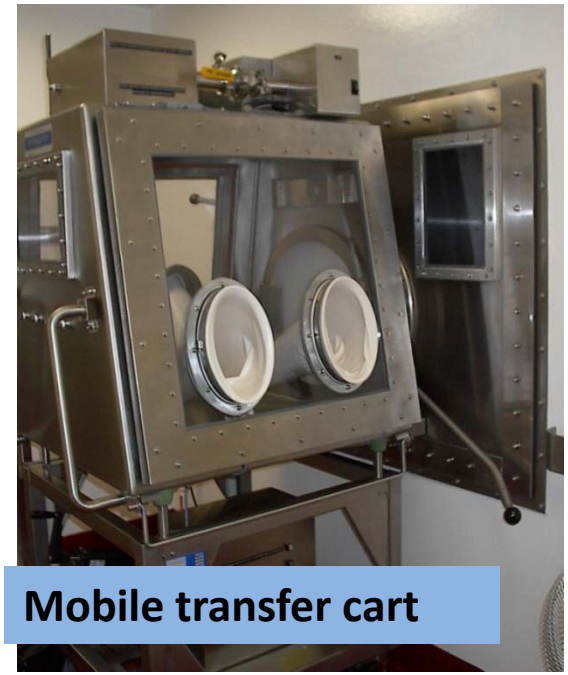
Animal Transport Components



Mobile transfer cart

Animal Transport Components

Plastic isolator

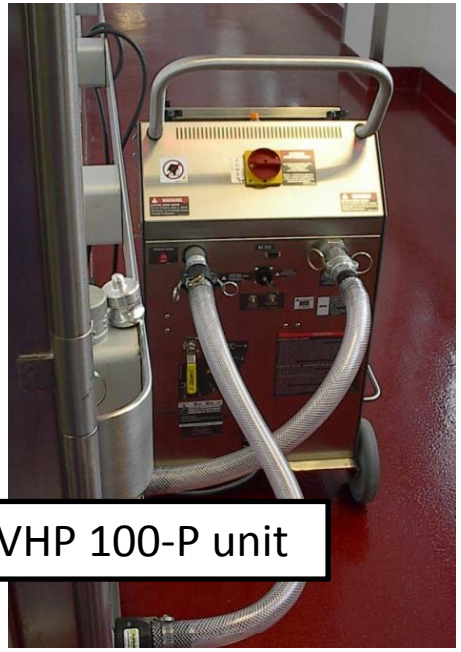
Transport Units: Decontamination Needs

1. Cart remains in ABSL-3
   - Mobile transfer cart
   - Interior decontamination required prior to transporting a different animal/pathogen

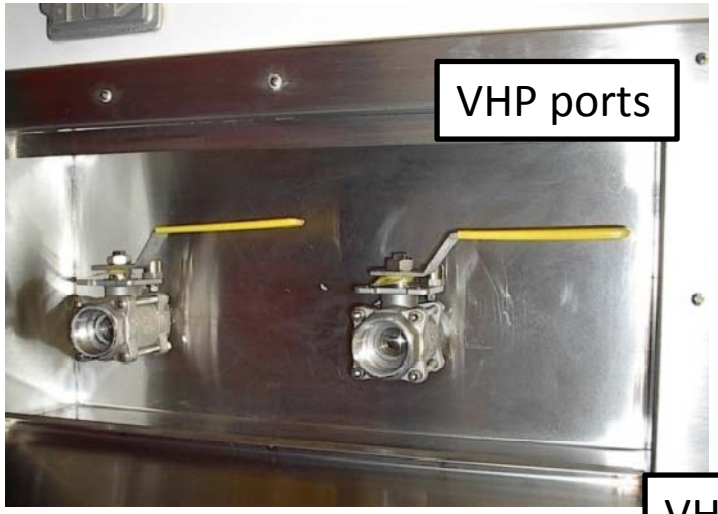
2. Cart comes out of ABSL-3
   - Mobile transfer cart
   - Interior and exterior decontamination required to remove cart for service and certification

3. Cart comes out of ABSL-3
   - Plastic isolator
   - Interior and exterior decontamination required to release cart for the next transport

The VHP Process



VHP 100-P unit



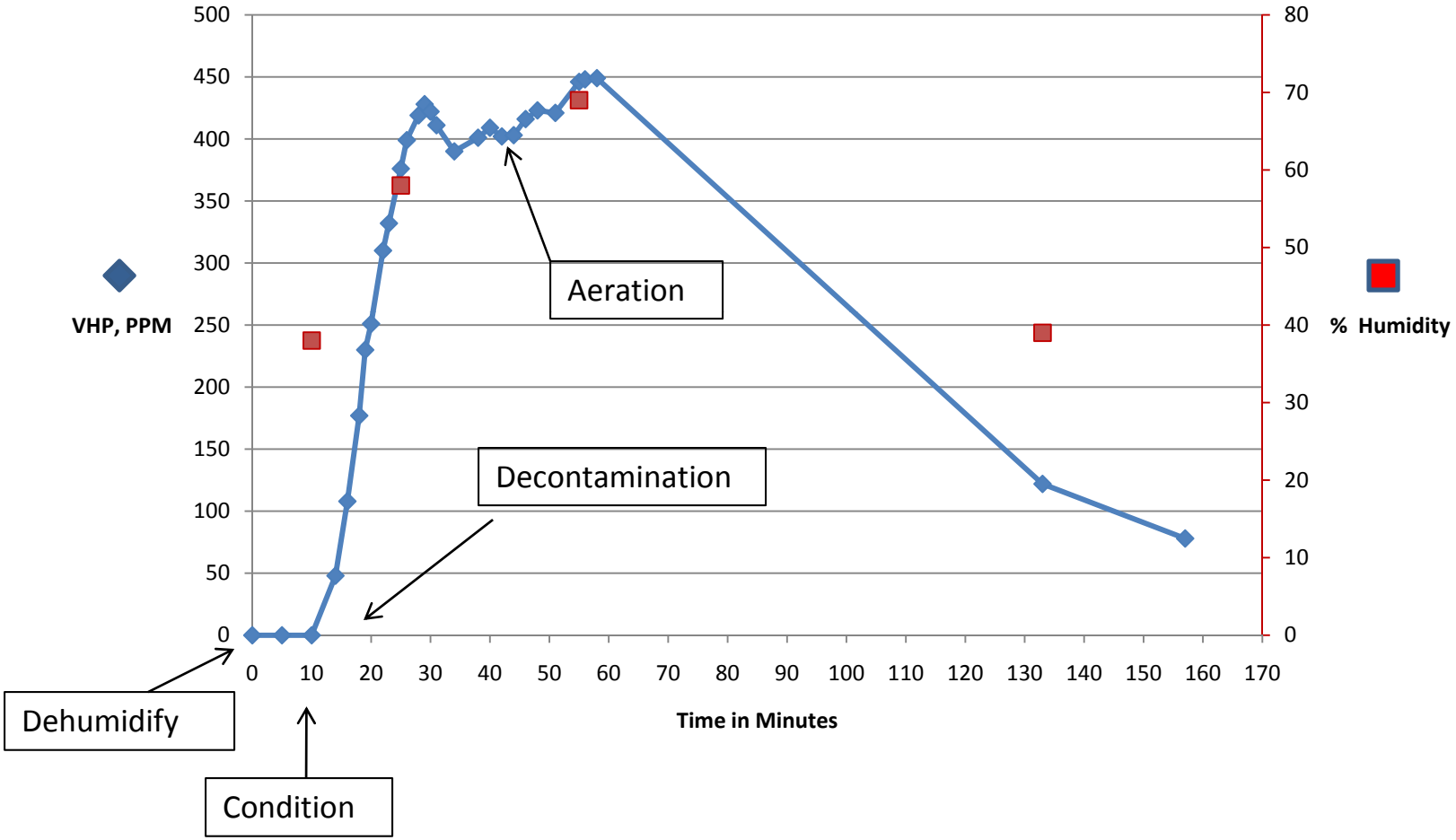
VHP ports

VHP sensor 0-2000 ppm

Biological & chemical indicators
(*Geobacillus* spores)

VHP sensor 0.0-20.0 ppm

The VHP Process



Conditioning: T=10 minutes
Decontamination: T=25 minutes
Aeration: T=55 minutes

Mobile Transfer Cart: Cart Remains in ABSL-3

- Done between pathogens
- Interior is treated with VHP
- Must clean and surface-disinfect prior to VHP
- VHP hoses connected directly to cart
- 30 min VHP + 3 hr aeration
- Reopen valves after cycle; restore fresh air to interior
- Same-day reuse of cart

Mobile Transfer Cart: Cart Remains in ABSL-3

Results:

- Ran cycle 3 times
- 29/30 biological indicators failed to grow
- Cycle parameters are considered validated
- For future cycles, will use 4 BI/CI per cycle

Lessons Learned:

- Less labor-intensive
- Rapid turnaround time; same-day to release/reuse equipment
- Real-time [VHP] not yet available
- Battery-operated fan important to distribute VHP
- No corrosion or deleterious effect on cart

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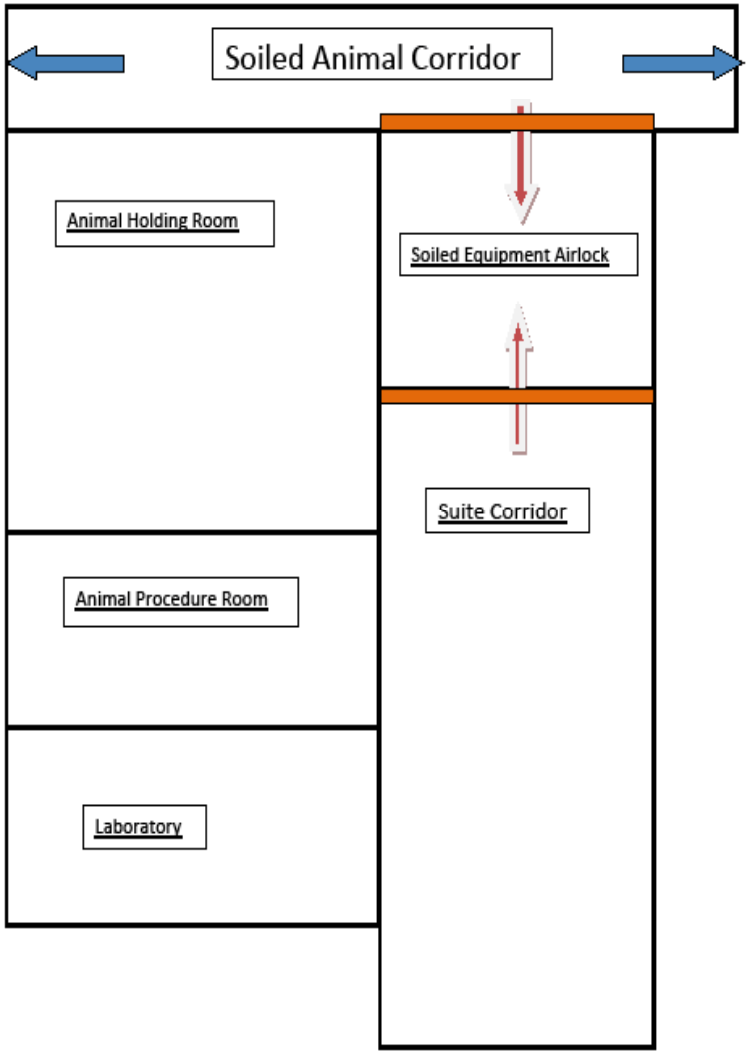
Both Carts:
Remove from ABSL-3

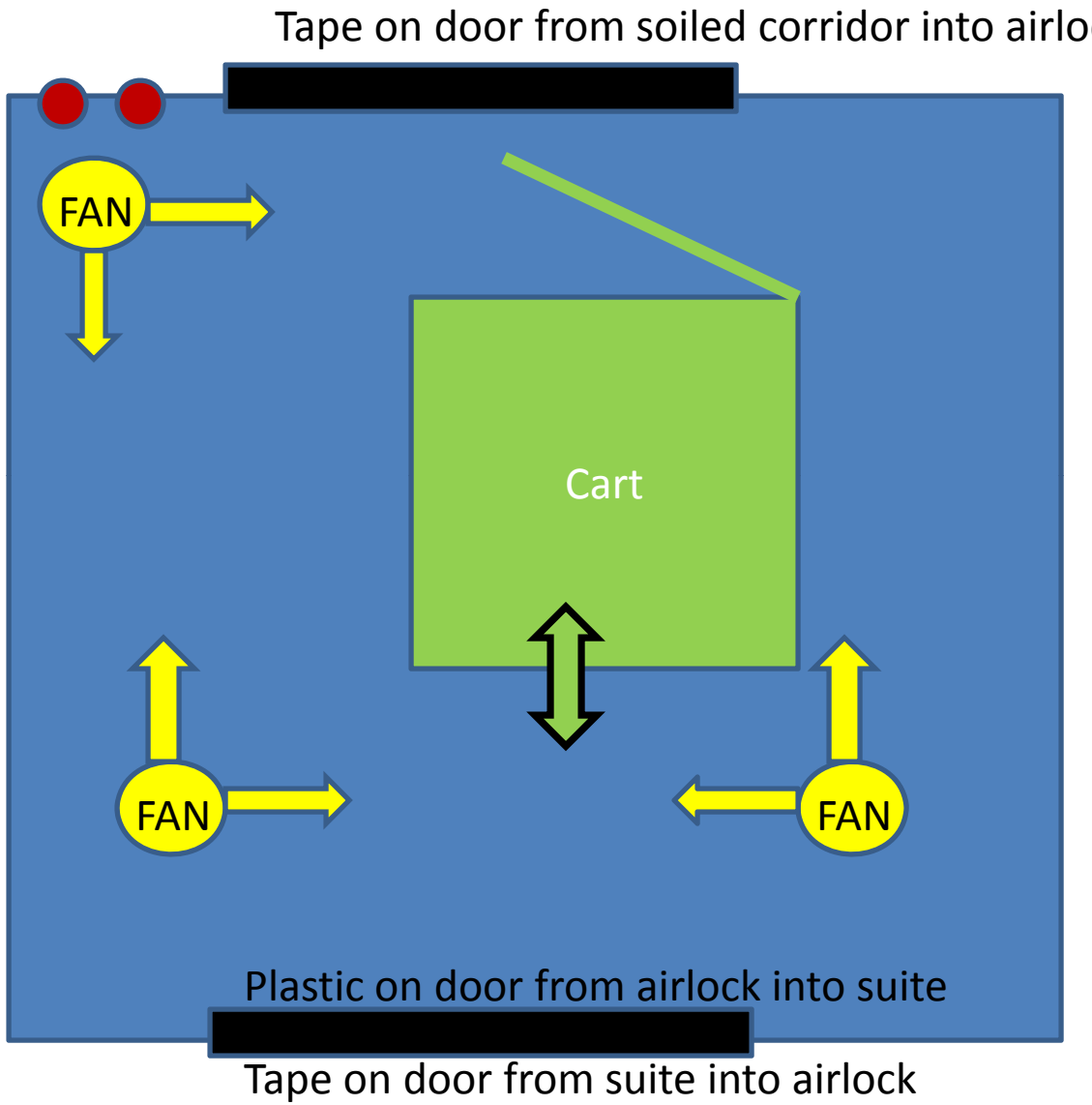
VHP in an effective decontamination room:

- Fill room with VHP and maintain at cidal level
- Prevent leakage of VHP
- No harm to nearby people, animals



VHP of Carts in Airlock

204 ft^3



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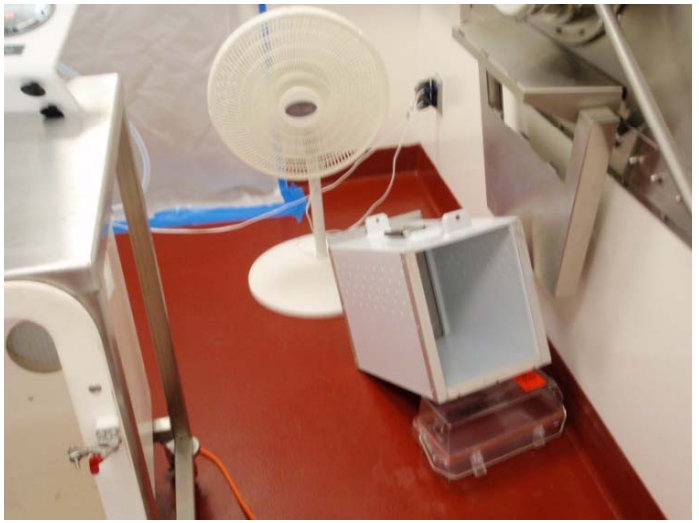
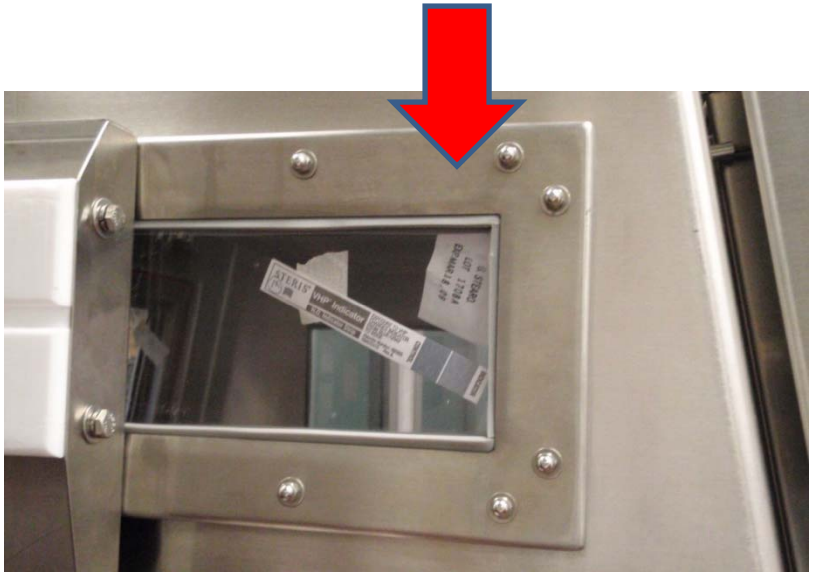
VHP of Carts in Airlock



VHP of Carts in Airlock

Indicators



Sequence of Events, Carts in Airlock

Date	Procedure		Personnel
Day 1	Clean and sanitize cart, move to treatment room.		2 vet techs
	Stage cart and airlock with indicators. Tape door and place plastic.		BSO
	Connect VHP equipment to room. Place fans. Tape last door.		BSO
	Adjust supply and exhaust air. Start VHP cycle. Monitor VHP level in animal suite.		Operations Manager BSO 1 vet tech
	Complete VHP cycle. Begin to adjust supply and exhaust air.		Operations Manager BSO
Day 2	Retrieve indicators and incubate. Move cart to clean airlock.		BSO or Vet tech
Day 3	Read indicator results. Release cart to clean area.		BSO or Vet tech

Cycle Parameters:
Carts in Airlock

Cycle Phase	Air Flow SCFM	Time Min.	Injection Rate	Other
Dehumid.	15	0-10	----	Hum = 7.6 mg/L
Condition	15	20	10 g/min	---
Decon	15	45	7 g/min	---
Aeration	15	60	---	---

Placement of BI

Biological Indicator #	Location	Day 1 result	Day 7 result
1	Northeast airlock wall near floor	Negative	Negative
2	Southeast corner of airlock behind cage railing	Negative	Negative
3	North/Northeast wall near ceiling	Negative	Negative
4	West wall behind cage railing	Negative	Negative
5	South wall of airlock	Negative	Negative
6	Top of mobile transfer cart on exhaust filter	Negative	Negative
7	Inside mobile transfer cart, NW corner near ceiling	Negative	Negative
8	Inside MTC, N corner on floor	Negative	Negative
9	Inside MTC, SE corner near ceiling	Negative	Negative
10	Inside MTC, S corner on floor	Negative	Negative

Results,
Carts in Airlock

- 21 cart treatments done, 5 treatments of other equipment in airlock.
- Pre-cleaning and sanitation of animal carts must be done.
- Multiple cycles run with 10+ indicators per cycle.
  - Carts: 168 total BI, 13 total positive BI at day 7.
- After engineering control incident and corrective actions, the validation was repeated and accepted.
- "Validation":
  - Usually NMT 10% positive BI in triplicate.
  - If >10% positive BI, take corrective actions, then repeat validation.
- Post-validation, require at least 4 BI/CI per cycle.

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Lessons Learned, Carts in Airlock

- Must clean and surface-disinfect prior to VHP
- Labor-intensive process requiring 3 days to release equipment
- Airlock is not available for animal transport or waste processing during the treatment
- Number and position of oscillating fans is key for distributing VHP
- Equipment with doors must be opened and facing fans
- Equipment with motors and fans should be left running to circulate VHP through internal systems
- No corrosion or deleterious effect on carts or other equipment treated including electronics

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Conclusions and Wish List

Conclusions:

- VHP treatment can be used to decontaminate animal transport equipment without damage.

- Interior-only VHP decon of mobile transfer cart is rapid and less intrusive to research and husbandry.

- Use of soiled ABSL-3 suite airlocks is necessary for decontamination of plastic cart and other equipment that needs to be released from the ABSL-3 facility.

Wish list:

- Dedicated VHP room; plastic isolator with VHP ports.

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Special thanks to

RBL Management Team:

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