



# *THE 2001 ANTHRAX ATTACKS: KEY LESSONS FOR FUTURE PREPAREDNESS*

Bioterrorism Critical Conversation  
Regulatory Governance Initiative

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# BACKGROUND ON 2001 ATTACKS

- Powdered spores mailed in letters
  - Four letters recovered (NBC, New York Post, Senators Daschle and Leahy)
- Twenty three cases of anthrax
  - 12 cases of cutaneous anthrax
  - 11 cases of inhalational anthrax/5 deaths
    - » 9 of 11 cases in workers believed to be exposed to letters containing *B. anthracis* spores
    - » Source of exposure in 2 cases unknown

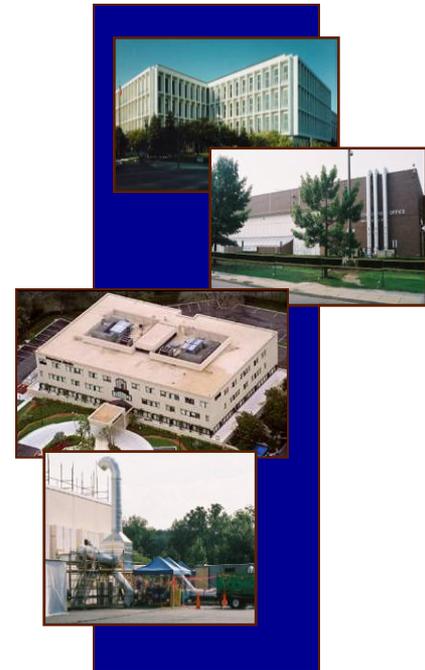


09-11-01  
YOU CAN NOT STOP US  
WE HAVE THE ANTHRAX  
YOU DIE NOW.  
ARE YOU AFRAID?  
DEATH TO AMERICA  
DEATH TO ISRAEL  
ALLAH IS GREAT.



# CONTAMINATED FACILITIES

- Postal facilities
  - Processing and Distribution Centers (P&DCs) (e.g., Brentwood, Trenton, Morgan)
  - Neighborhood post offices
- Office Buildings
  - Media offices: NBC, CBS, New York Post, AMI building
  - Congressional office buildings
- Residences



# *TWO TYPES OF CLEANUPS*

- Surface cleanups using liquid decontamination products
  - Sites with limited surficial contamination (e.g., contact with mail)
  - Residences, NYC media offices, large/small postal facilities
- Large-scale cleanups with fumigations as main decontamination process
  - Sites with aerosolizable spores as demonstrated by
    - » Cases of inhalational anthrax
    - » Environmental sampling results
    - » Lab studies on recovered spores

# REMEDIATIONS WITH FUMIGATIONS (7)

Site	Fumigant*	Volume fumigated (ft <sup>3</sup> )	Fumigation Approach	Duration of closure of facility	Cost
Hart Senate Office Building (Daschle suite/two air handling units)	ClO <sub>2</sub>	~90K	Fumigate office suite/air handling units in two separate steps	>3 months	~\$28M
Brentwood P&DC		>14M	Fumigate entire facility in one step	>2 years	~\$200M for both cleanups
Trenton P&DC		~6M		>2 years	
AMI Bldg		675K		>4 years	<\$5 M
Dep't of Justice mail room	pHCHO	8.3K	Tent and fumigate equipment in one step	>4 months	\$464K
GSA Bldg 410	VHP	1.6M	Subdivide entire facility and fumigate each portion separately	~3 years	~\$6 M
Dep't of State Annex-32		1.4M		>3 years	~\$9 M

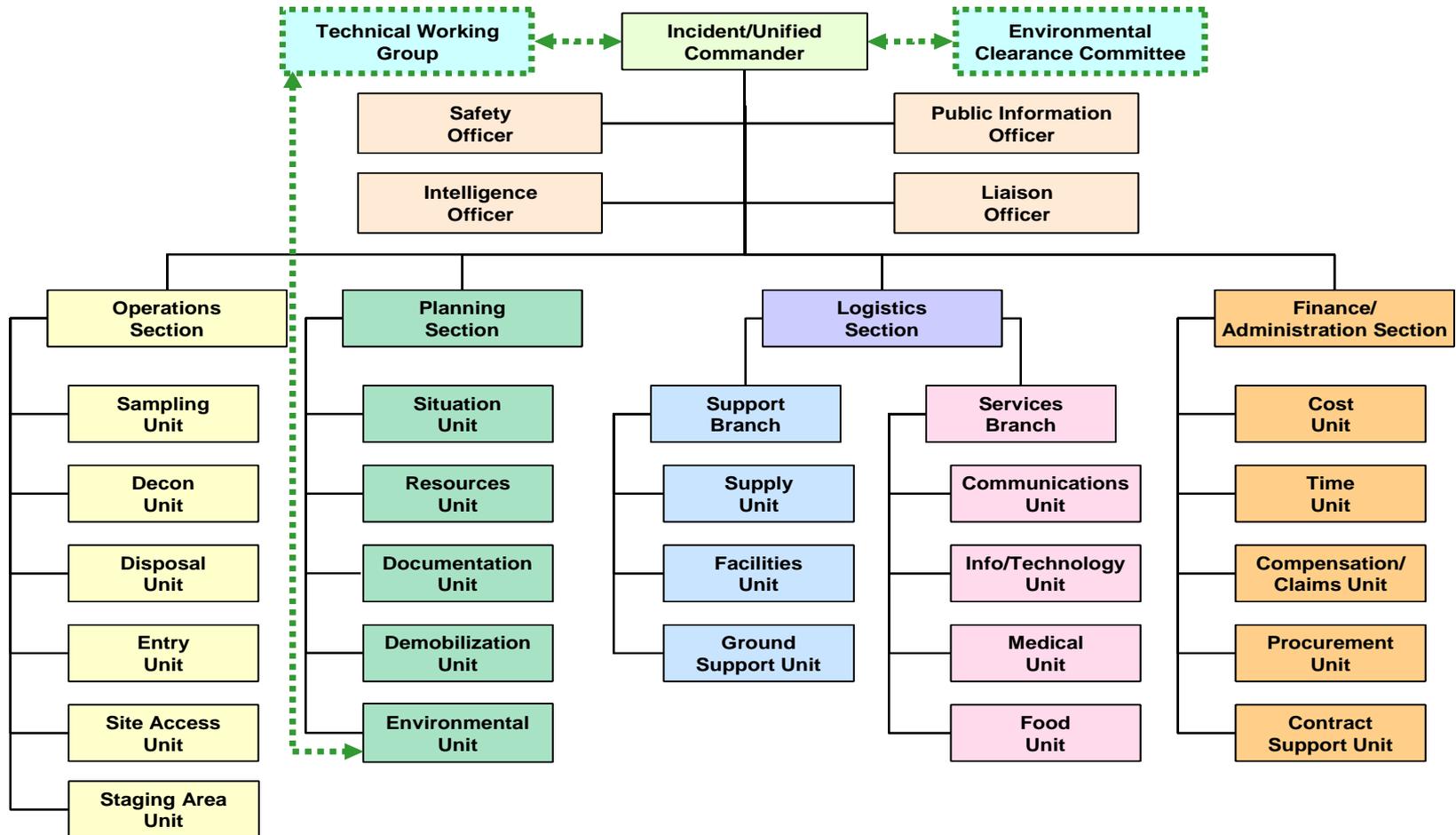
\* ClO<sub>2</sub> = gaseous chlorine dioxide; pHCHO = paraformaldehyde; VHP = vaporized hydrogen peroxide



# *KEY LESSONS LEARNED: ANTHRAX ATTACKS*

- Need to evaluate all sites on individual basis
  - Multi-disciplinary, multi-agency response needed
    - Key that Incident Command System be used for response and recovery actions
  - Key role for scientific advisory panels in adding credibility to recovery process/re-occupancy
    - Technical Working Group
    - Environmental Clearance Committee
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# UNIFIED COMMAND STRUCTURE



# KEY LESSONS LEARNED: ANTHRAX ATTACKS

- Environmental sampling key at multiple stages of remediation process
- For large sites an online data management system should be promptly established for very large volume of sampling and other data to be generated/analyzed/used for decision-making





# *KEY LESSONS LEARNED: ANTHRAX ATTACKS*

- For sites with aerosolized *B.a.* spores, fumigation is default remediation process
  - All fumigants have pros and cons
- 24/7 cleanups needed for critical infrastructure



# KEY LESSONS LEARNED: ANTHRAX ATTACKS

- Disposal of decontamination waste will very challenging (NIMBY) and costly
  - Need to comply with all federal/state/local regulations for transportation of waste



# KEY LESSONS LEARNED: ANTHRAX ATTACKS

- Communication with stakeholders/ media/ public/ relevant agencies crucial throughout response and recovery processes
  - Site owner, officials of relevant regulatory agencies, Incident Commander, members of media should be first to enter facilities cleared for re-use



# *KEY LESSONS LEARNED: ANTHRAX ATTACKS*

- Future remediation processes in large buildings that include fumigations will be complex, quite time-consuming and very costly



# RESPONSE AND RECOVERY

Response (Crisis Management)	Recovery (Consequence Management)			
	Remediation			Restoration/Re-occupancy
Notifications	<b>Characterization</b>	<b>Decontamination</b>	<b>Clearance</b>	Site Renovation
Incident Command System	Health and Safety Plan	Decontamination Strategy	Final Clearance Sampling Plan	Environmental Monitoring
Life/Safety	Characterization Environmental Sampling	Final Site Containment	Clearance Environmental Sampling	Re-occupancy Decision
Medical/Public Health	Qualitative Risk Assessment	Preparation of Needed Plans	Clearance Decision	
Site Containment	Clearance Goals	Site Preparation		
Forensic Investigation	Waste Management	Source Reduction		
Screening Environmental Sampling		Main Decontamination		
Waste Management		Evaluation of Decontamination		
		Waste Management	Waste Management	

**Communication**