



EMERGENCY!

High-Tech Facility Design and Operation for
Effective Emergency Response

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- Emergency Response Philosophy
 - Internal Responders
 - External Responders
- Emergency Response Facilities
 - Command Center
 - Emergency Response Building Example
 - Emergency Assembly Area
 - Facility Design
- Emergency Response Procedures
 - Building Emergency Plan



Designing for Emergency Response

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EMERGENCY RESPONSE PHILOSOPHY

Internal and external responders

- Ensuring that all personnel are safely out of the building
- Correcting the problem that is creating the emergency situation



Question:
Which is more important?

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- In an emergency situations, multiple tasks must be performed simultaneously
- Manpower is always an issue
- Local knowledge is an important consideration



TEAMWORK IS THE SOLUTION

Answer:

Both are equally important!

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- External resource availability
 - Local or internal Fire Department
 - Local or internal EMTs
 - Local or internal Police Department
- Internal expertise
 - Facility expertise
 - Safety expertise
 - Maintenance expertise
- Forging a partnership
 - Based on mutual respect
 - Familiarity is a key element



Emergency Response Philosophy

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- Establishment of roles during an emergency
- What “flavor” of ERT is appropriate
 - “Informal” ERT
 - Incipient Fire Brigade
 - Other
- Working with external Fire Department
 - External responders are always in charge



Emergency Response Philosophy

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- Training level
 - Hazwoper
 - 8-hour, 24-hour, 40-hour credential
 - Incipient Fire Brigade
- Specific emergency-response training
 - Respirator (including fit-testing)
 - SCBA
 - Fire extinguisher
 - CPR – External Defibrillator



ERT Training

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- Emergency Planning Activities
 - Sitting down in a room together is invaluable
 - Discuss building hazards
 - Discuss building systems to mitigate hazards
 - Discuss building system functions during an emergency
 - Learn from each other's expertise
 - Define roles of ERT
 - Who goes where?
 - Who does what?



Forging a Partnership

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- Team approach
 - Pair outside responder with ERT member
 - Building sweep
 - Equipment remediation
- Facility familiarization
 - Tours – “good to see you without your turnout gear”
- Commonality of equipment (when practical)
 - Communications system
 - SCBA



Forging a Partnership

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- Drills are very important
 - Familiarizes responders with both facilities and procedures
 - Points out defects in the plan
 - Equipment
 - Processes
 - Reinforces response through “muscle memory”
- Frequency
 - Depends on number of “real” emergencies
- Post-drill analysis is critical in getting the most out of a drill



Drills

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- Single-Point Interface with Incident Command
- Emergency Response Team
- Supervision of Emergency Assembly Area
- Oversight of Building Access Points
 - Redundant to security system
- Provide technical information to responders
 - Specific facility information
 - Alarm information
 - Access to Technical Experts



Emergency Roles of Facility Staff

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- If possible, involve external responders
- Review outcomes of incident
 - Was anyone hurt
 - Magnitude of financial impact
- Review performance of all constituents
 - External responders
 - Internal responders
 - Occupants
- Generate action plans to correct deficiencies
 - Measureable goals
 - Dates for completion are critical



Post-Incident Analysis

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FACILITIES TO SUPPORT EMERGENCY RESPONSE

Initially designed into building
Modifications to building

- Upwind under prevailing conditions
- Outdoor location
- Inside the building
- Adjacent building
- Dedicated building



Command Center

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- Advantages
 - No cost to low cost
- Disadvantages
 - Vulnerable to weather
 - Need a separate location to store equipment and supplies



Outdoor Location

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- Separate air handling from main building
 - No mixing of air from hazardous areas
- Access and egress must be determined
 - Cannot pass through areas where air is recirculated from hazardous areas
 - Good access for emergency responders



Inside the Building

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- Quick access
 - Ensure building is unlocked at all times or access is provided
 - Near building where emergency is occurring
 - Secure area for equipment storage is an advantage



Adjacent Building

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- Access control
 - Secure during normal situations
 - Full and immediate access during emergencies
- Custom design
 - Access to building systems
 - Repository for emergency response information
 - Secure storage of emergency-response equipment
- Higher cost
 - Prefabricated building reduces cost



Dedicated Building

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- ERT equipment
- Alarm system information
- Building-control access
- Detailed building information
 - Building plans
 - MSDS forms
 - Biosafety information sheets
- Emergency Response Plan



Available at Command Center

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Emergency Response Building is located approximately 50 feet from nanotechnology facility

Air-pack donning area with stools

Example of an Emergency Response Building

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Computers tied to alarm systems and building control system; land-line telephone

Example of an Emergency Response Building

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Rack for cold-weather gear and drafting table with building plans

Storage rack with radios, air-quality monitor, and spare air cylinders

Example of an Emergency Response Building

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- A safe distance from the facility
- Indoor location preferred
 - Inclement weather
 - Ease of announcements
 - Must have access 24/7
- Allows ready access to technical experts not involved in emergency response activities
- Communication with emergency response efforts is a significant advantage

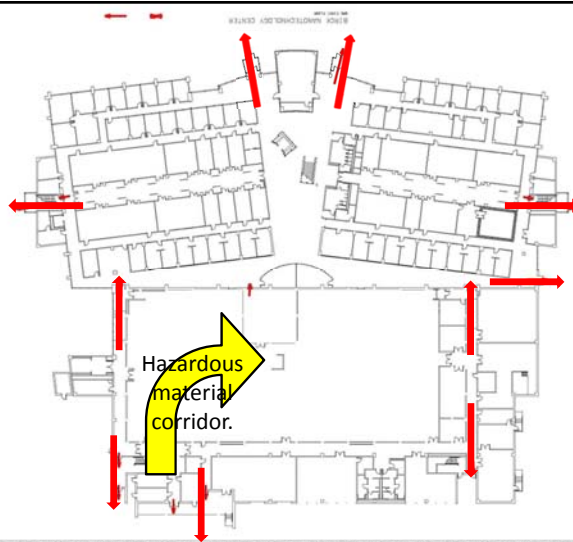


Emergency Assembly Area

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DESIGNING FOR EMERGENCY RESPONSE

New building or modifications to an existing building



Exit corridors do not cross hazardous material corridor.

Exit Corridors

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- Voice message over alarm tone
 - Specific instructions on how to respond
 - Evacuation
 - Tornado shelter
 - Shelter in place
- Mate with building security system
 - Locks and unlocks doors as appropriate
- Communicate with building management system
 - Sends text alerts to appropriate responders



Alarm Systems

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- During an Evacuation
 - Lock all exterior doors
 - Access for internal and external emergency responders
 - Unlock all interior doors
 - Quicker access for emergency personnel
- During a Tornado Warning
 - Unlock all exterior doors
- During a Campus Violence Situation
 - Card access only for exterior doors



Emergency Functions of Building Security System

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- Emergency notifications through text messaging
 - Automated text messages from Building Control System
 - Linked with alarm systems
 - Select individuals receive messages based on which system is in alarm
 - Everyone receives evacuation alarm
- Call-in telephone number for emergency responders
- Radio communications for emergency responders
 - Radios located in offices and in Emergency Response Building



Communications Systems

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EMERGENCY RESPONSE PROCEDURES

Building Emergency Plan

- Subdivided into two documents
 - Public Document
 - Available on web site
 - Information from document basis for orientation classes
 - Confidential Document
 - Includes public document
 - Available to
 - Emergency responders - internal and external
 - Facility leadership
 - Campus Emergency Planning Office

Building Emergency Plan

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- Public document
 - What to do in an emergency
 - Exit paths and shelter locations
 - Alarm and emergency equipment locations
 - Resources available and contact information
 - Supplemental information for people with disabilities



Building Emergency Plan

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- Confidential document
 - Emergency contact numbers
 - Private cell phone numbers
 - Technical expert information
 - Detailed facility information
 - Location of hazards
 - Detailed building layouts
 - Detailed response procedures



Building Emergency Plan

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