ER

Emergency Response P1: NIMS-NRP

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- **Materials responsible for**:
  - http://www.cse.usf.edu/~murphy/Courses/IntroHST
- **Assignments**
  - 2/15: Review 1 (posted)
  - 2/17: ER executive summary (not posted yet)
  - 2/22: Comms executive summary (not posted yet)
- **Next lectures and activities**
  - 2/3 ER P2: Geoff Williams
  - 2/8 ER P3: Murphy
  - 2/10 ER P4: self-study http://training.fema.gov/EMIWeb/IS/is195.asp
  - 2/15 Comms P3 (last): Weller
  - 2/17 library support
- **Objectives of this session:**
  - Understand the general flow of emergency response
  - Know the difference between NIMS and NRP
  - Define an incident of national significance
  - Be familiar with the technology push in disaster management

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Administrivia

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- Must have “CIS6930” in subject or I am extremely unlikely to get your email or read it promptly
- Need to read what’s on the webpage I gave you on the first day of class

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Executive Summaries
(from 1st lecture)

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- Seminar talks and field trips will be grouped into topics (e.g., network and communications, emergency response, etc.)
- For each topic, you will write a 2 page (single spaced) executive summary
- Bad News
  - Speakers may not be in sequence, so have to take good notes to be able to recall and synthesize
  - But… will have on server to replay talks

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Emergency Response Segment

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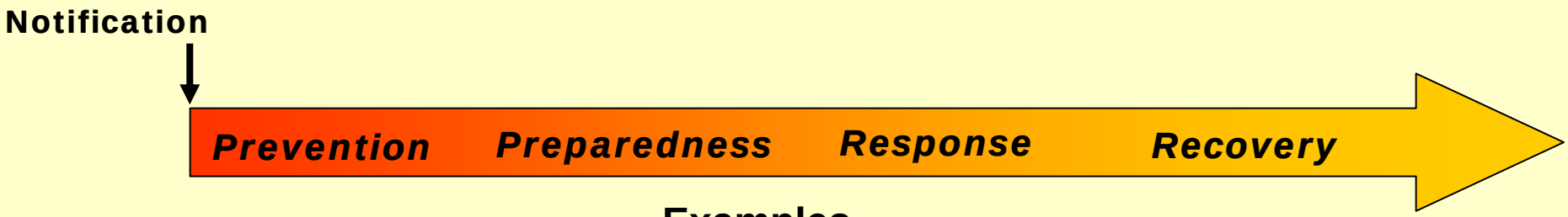
- 4 segments
- Top-down organization of resources
  - P1: NIMS and NRP
    - Acknowledgment: Many slides are taken from DHS presentations on web
  - P4: ICS195 online tutorial
- What really happens
  - P2: “Playing Russian Roulette with Catastrophic Command” Geoff Williams
  - P3: “Science, Technology, and Real Responses” Robin Murphy

Phases of Incident Management Activities



Examples

Prevention

- Implement countermeasures such as security and infrastructure protection
- Conduct tactical ops to interdict or disrupt illegal activity
- Conduct public health surveillance, testing immunizations and quarantine for biological threats

Preparedness

- Pre-deployment of response assets
- Pre-establishment of ICPs, JFO, staging areas and other facilities
- Evacuation and protective sheltering
- Implementation of structural and non-structural mitigation measures

Response

- Emergency shelter, housing, food & water
- Search and rescue
- Evacuation
- Emergency medical services
- Decontamination following a WMD attack
- Removal of threats to the environment
- Emergency restoration of critical services

Recovery

- Repair/replacement of damaged public facilities (bridges, schools, hospitals)
- Debris cleanup & removal
- Temporary housing
- Restoration of public services
- Crisis counseling
- Programs for long-term economic stabilization and community recovery

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If a Disaster Strikes, Who is In Charge?

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- Example: Gasparilla
- Tampa Police Department has jurisdiction
- But…
  - Division of Public Works has all the road cones for an evacuation
  - Tampa Fire Department has HazMat crew
  - Hillsborough County Sheriff's Office has supplemental manpower and equipment
  - Florida Department of Law Enforcement has intelligence
  - Tampa General Hospital is the only trauma and burn unit but effectively cutoff by parade route and bystanders
  - Coast Guard was protecting port and water safety

Emergency Support Functions

(before 9/11)

ESF #1 Transportation
Department of Transportation

ESF #2 Communications
National Communications System

ESF #3 Public Works and Engineering
Department of Defense
U.S. Army Corps of Engineers

ESF #4 Firefighting
Department of Agriculture
Forest Service

ESF #5 Information and Planning
Federal Emergency Management Agency (FEMA)

ESF #6 Mass Care
American Red Cross

ESF #7 Resource Support
General Services Administration

ESF #8 Health and Medical Services
Department of Health and Human Services

ESF #9 Urban Search and Rescue
FEMA

ESF #10 Hazardous Materials
Environmental Protection Agency

ESF #11 Food
Department of Agriculture
Food and Nutrition Service

ESF #12 Energy
Department of Energy

Don’t Forget…

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- Where does law enforcement (police, FBI) come in?
- Who’s going to pay all of these people?
  - Most disasters are cost reimbursable but must have some accounting procedures
- Who’s going to figure out where they report to? Where they sleep? Etc.

National Incident Management System (NIMS) and National Response Plan (NRP)

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- Need a general "org chart" for incidents that require more than one agency
  - Should be scalable from local events to 9/11
  - Even so, can take 12 hours to stabilize an incident

NIMS

- Need some pre-planning of possible disasters to reduce response time

NRP

Why Do We Need NIMS?

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Lessons learned have shown the need for:

- A coordinated response
  - Unified command: everyone reports to just one person, which may not be in their normal chain of command or from their home agency
  - Span of control: a person does not oversee more than 7 people
- Standardization.
  - Don’t use department specific jargon
- Interoperability.

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NIMS Concepts and Principles

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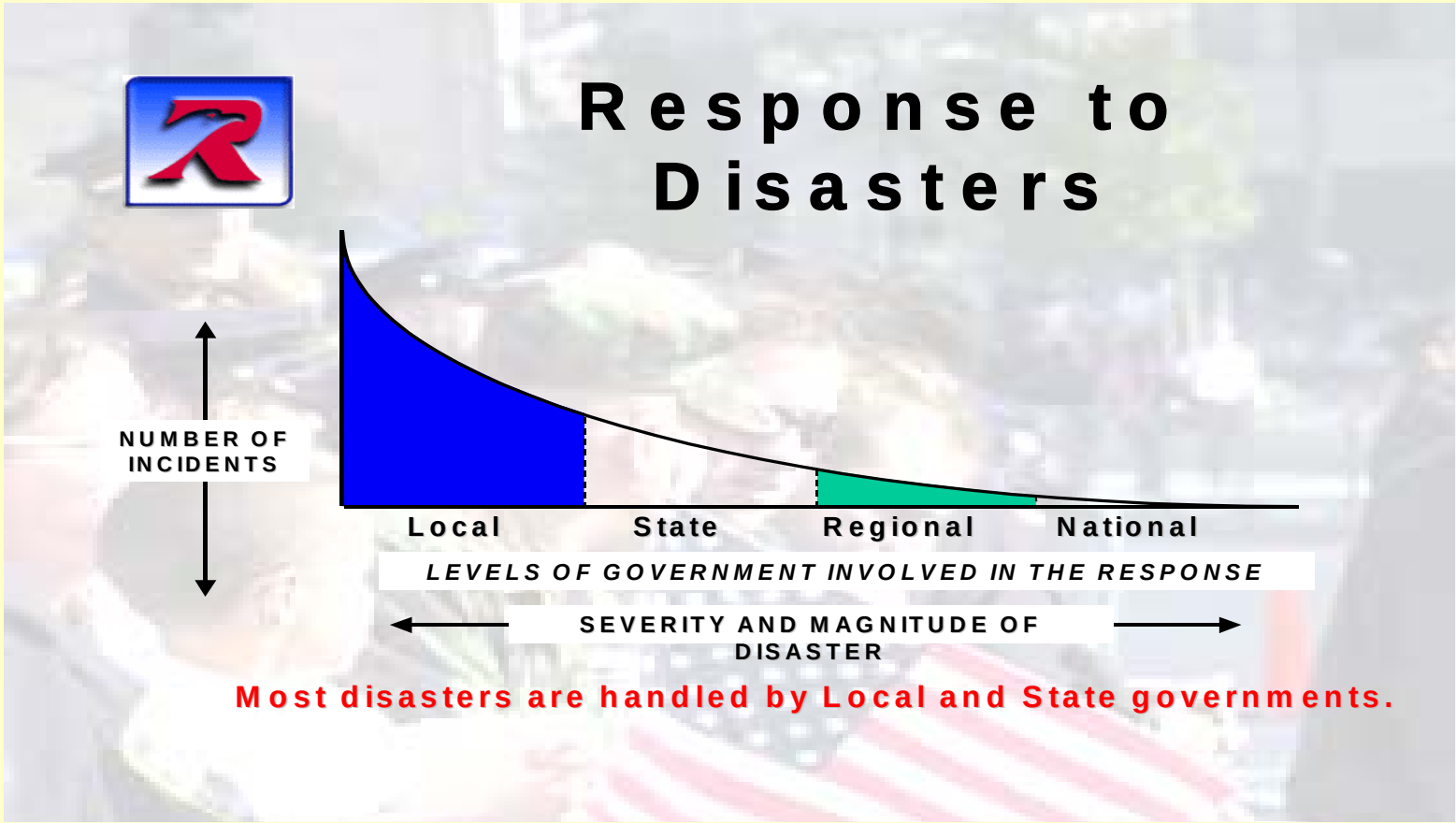
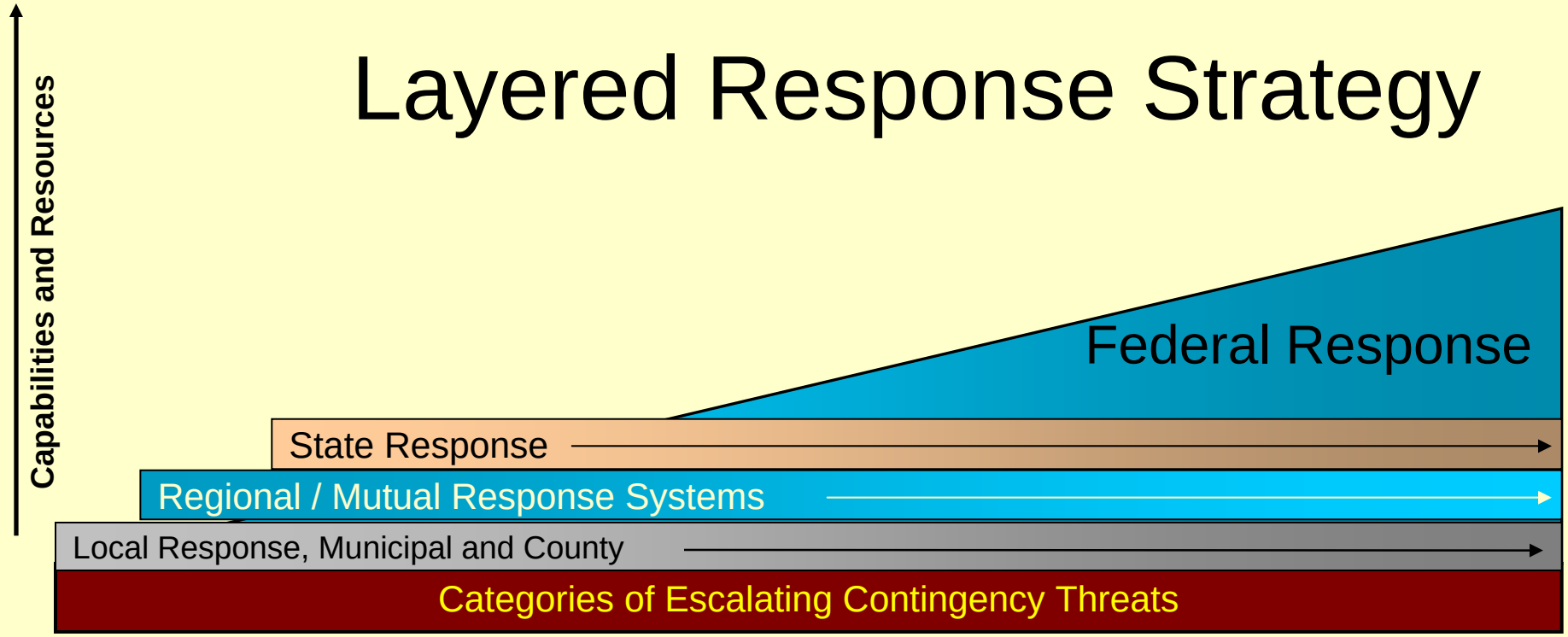
NIMS is:

- Flexible to enable all responding organizations to work together.
- Standardized to improve overall response and interoperability.
- Scalable so that one system works for the spectrum

Scalability: Incident Spectrum



Layered Response Strategy



MINIMAL	LOW	MEDIUM	HIGH	CATASTROPHIC
Tornado	Ice Storm	Flood	CAT 3 - 4 Hurricane	LA Earthquake / New Orleans CAT 5 Hurricane
Influenza, food borne illnesses, endemic plague	Anthrax, plague with 1-2 cases	Pandemic Influenza	Smallpox	Bio-Engineered Agent
Traffic Accident	HAZMAT Spill	Aircraft Crash	Dam Break	Nuclear Plant Significant Incident

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National Incident Management System

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- Provides the national standard for incident management
- Based on the National Interagency Incident Management System (NIIMS) Incident Command System (ICS)
  - Established during the 1970s by California in response to a series of disastrous wildfires and adopted by the federal government
  - ICS was voluntary, now is mandatory for HazMat incidents
    - States now requiring it for reimbursement purposes
- **Major components**:
  - Incident Command and Management
  - Preparedness
  - Resource Management
  - Communications and Information Management
  - Supporting Technologies
  - Ongoing Management and Maintenance

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Command & Management

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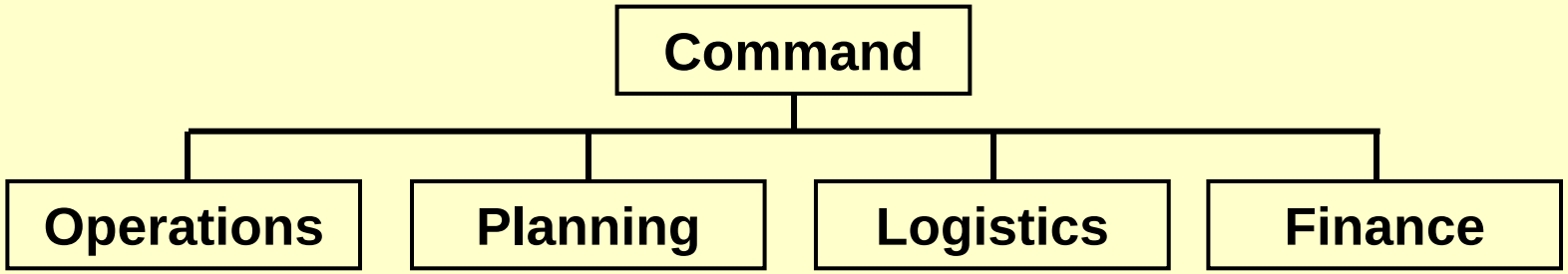
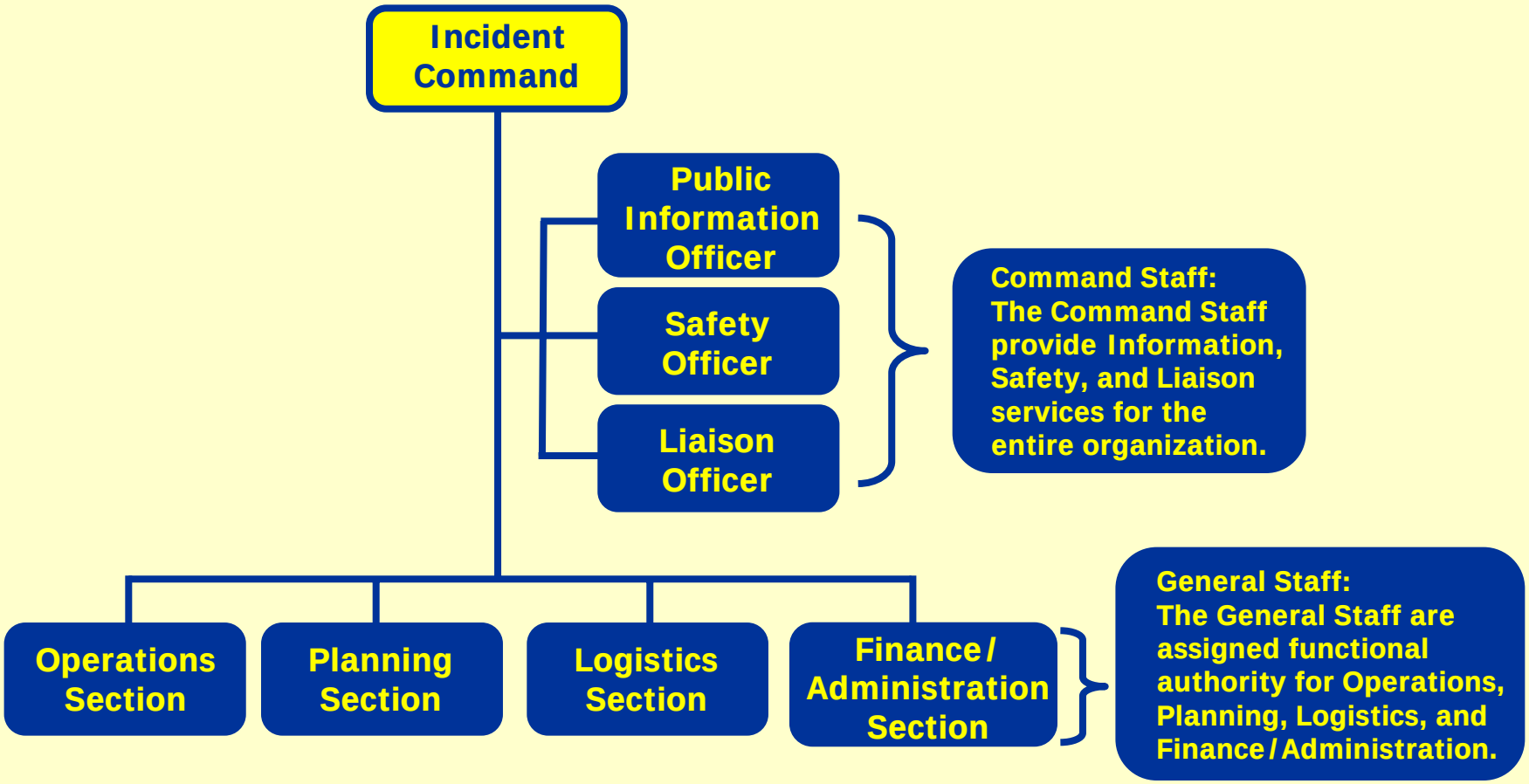
- **Incident Command System** (ICS): Management system designed to integrate resources from numerous organizations into a single response structure using common terminology and processes
- Incident management activities organized under five functions:



- **Unified Command** incorporates Federal, State, Tribal, Local and non-governmental entities with overlapping jurisdiction and incident management responsibilities

Expanding the Organization



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NIMS Standard Structures

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- Incident Command System (ICS)
- Multi-agency Coordination Systems
- Public Information Systems

Preparedness

- Planning, training, and exercises
- Personnel qualification and certification
- Equipment acquisition and certification
- Publication management
- Mutual aid/Emergency Management Assistance Compacts

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Resource Management

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Includes standardized:

- Descriptions
- Inventories
- Mobilization
- Dispatch
- Tracking
- Recovery

Communications/Information Management

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NIMS identifies requirements for:

- Communications.
- Information management.
- Information sharing.

Supporting Technologies

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NIMS provides systems to standardize:

- Voice and data communications.
- Information management.
- Data displays.

NIMS Example

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- Example: trench collapse
- Engine company arrives on scene; establishes incident command
- As assesses the situation, calls in special operations unit, police to help with crowd control, separates victim's families from press and assigns temporary PIO, safety officer
- Special operations unit (US&R) arrives, incident command is transferred to him/her
  - Quickly fills in org chart template
  - 1 person can do multiple jobs (except safety and IC)
  - Span of control is 3-7, with 5 being optimal
- IC sets up group to help locate resources: calls in special dirt removal equipment from public works, additional equipment from nearby county (mutual aid)
- Liaison officer escorts OSHA representative

NIMS in reality

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- Example: Hurricane Ivan
- Each municipality has jurisdiction, but ceded to state after landfall
  - State did NOT cede or involve FEMA
  - Some localities did not release resources for mutual aid
- FEMA US&R
  - pre-deployed teams and set up parallel JROC (Atlanta) and IC (Lakeland IST)
  - FEMA FL-TF1, FL-TF2 sent from Miami to Gulf Shores, Alabama (drove past FL-TF3 regional which worked Pensacola)

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Incidents of National Significance

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- Homeland Security Presidential Directive-5 (HSPD-5)
  - Partial response to World Trade Center
- Defined incidents which require DHS operational coordination and/or resource coordination. Includes:
  - Credible threats, indications or acts of **terrorism** within the United States
  - **Major disasters or emergencies** (as defined by the Stafford Act)
  - **Catastrophic incidents**
  - **Unique situations** that may require DHS to aid in coordination of incident management…

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Pro-active Response to Catastrophic Events

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Catastrophic Event:

- Any natural or manmade incident, including terrorism, which leaves **extraordinary levels of mass casualties, damage and disruption severely affecting the population, infrastructure, environment, and economy**.
- Results in **sustained national impacts over a prolonged period of time**, exceed resources normally available in the local, State, Federal, and private sectors, and significantly interrupt governmental operations and emergency services to such an extent that national security could be threatened.

Pro-active Federal Response:

- **Essential and Extensively Federal assets** are pre-identified and strategically located for rapid deployment.
- Catastrophic Incident Response Annex (Initial Catastrophic Incident Response Plan)

National Level Coordination

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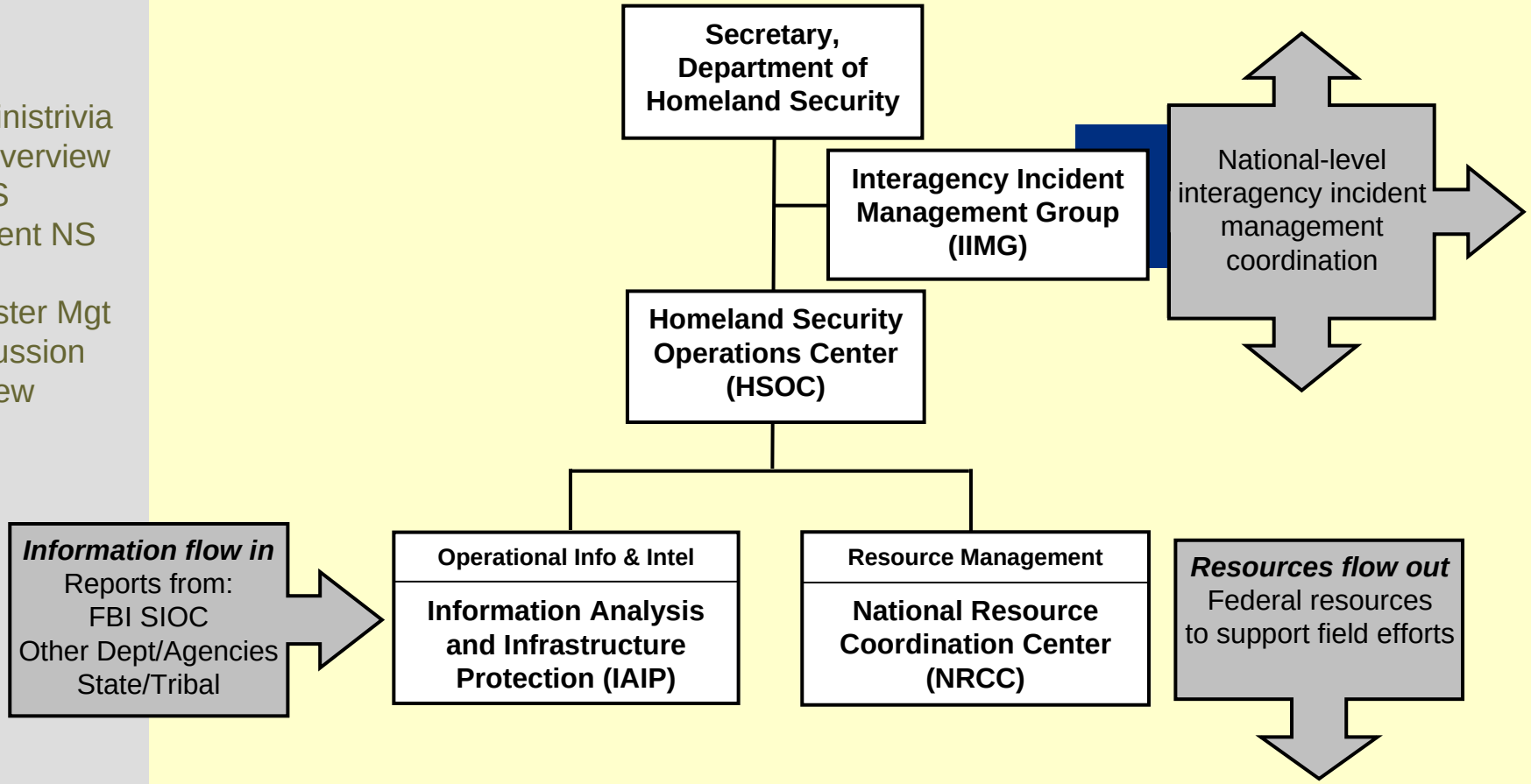

Concept of Operations

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Pre-Incident:

- Emphasis on Prevention, Preparedness and Mitigation
- HSOC receives reports of terrorist threats and potential incidents
- Conducts assessment and coordinates with Departments and Agencies to deter, prevent, mitigate and respond
- Potential Incident of National Significance:
  - Activates NRP components to provide Federal operational/resource assistance to prevent/minimize impact

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Concept of Operations

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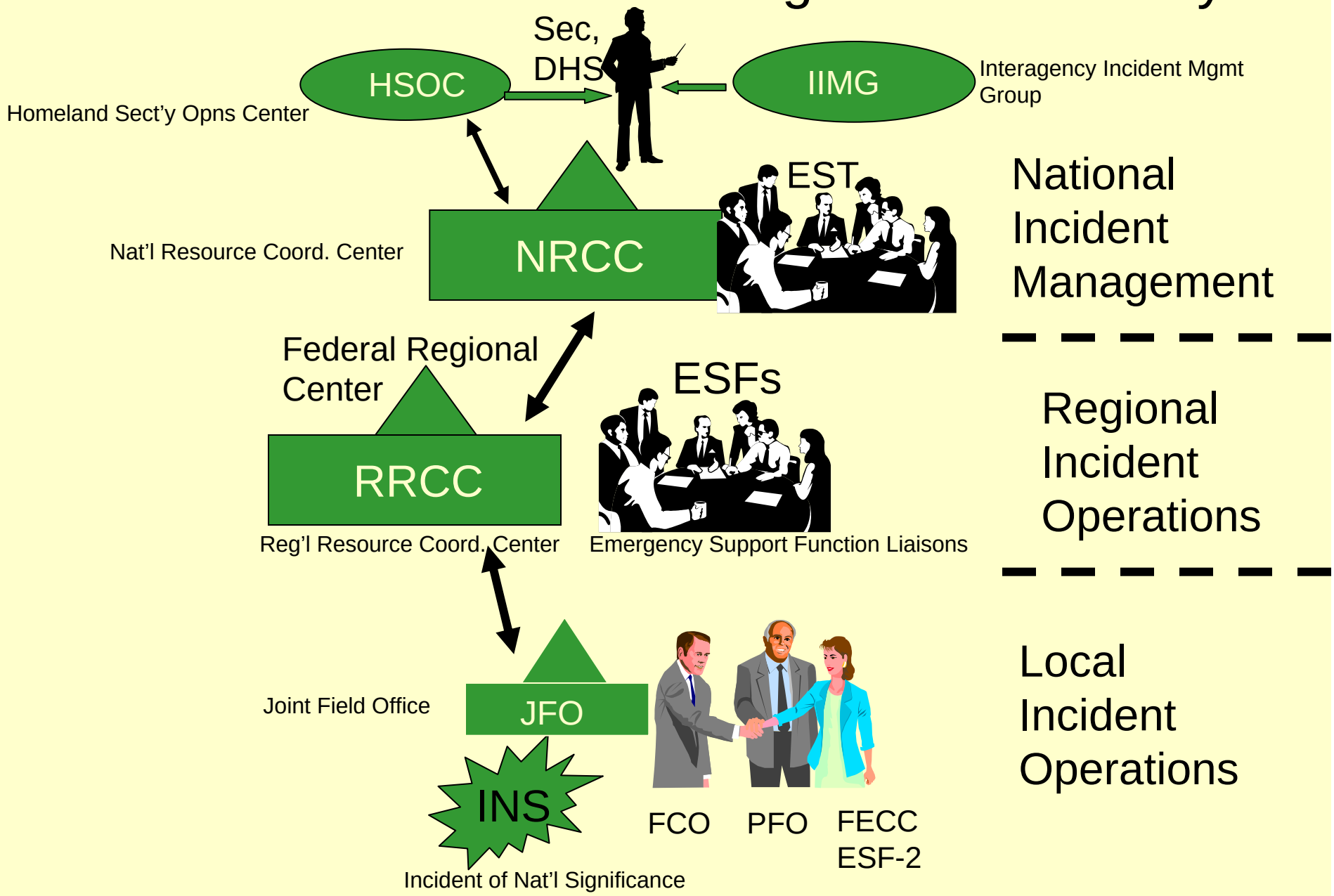
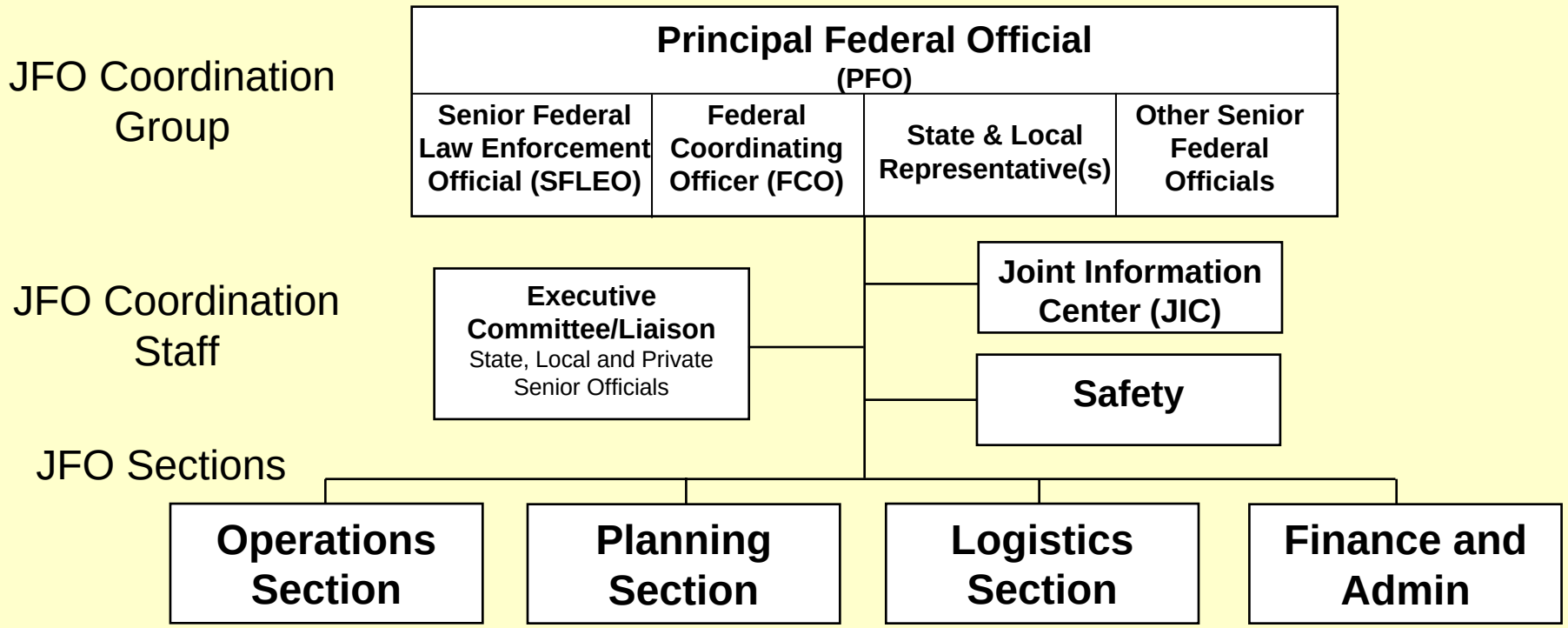
Post-Incident:

- Emphasis on Response and Recovery
- On-scene operations managed by ICS/Unified Command
- **IIMG**, **NRCC** and **HSOC** provide national level policy, information, resource and operational coordination
- State, Tribal, local and other Federal agencies may request assistance, and may result in Presidential Disaster Declaration
- Joint Field Office (JFO) established
  - Integrates Federal operational and resource coordination with State and locals
  - **JFO Coordination Group**: Principal Federal Official (PFO), Senior Federal Law Enforcement Official (SFLEO), Senior Federal Officials (SFOs), and State, Tribal & Local Reps

Illustration of Incident Management Hierarchy



Joint Field Office



Integrates traditional JOC and DFO functions

NRP Objectives

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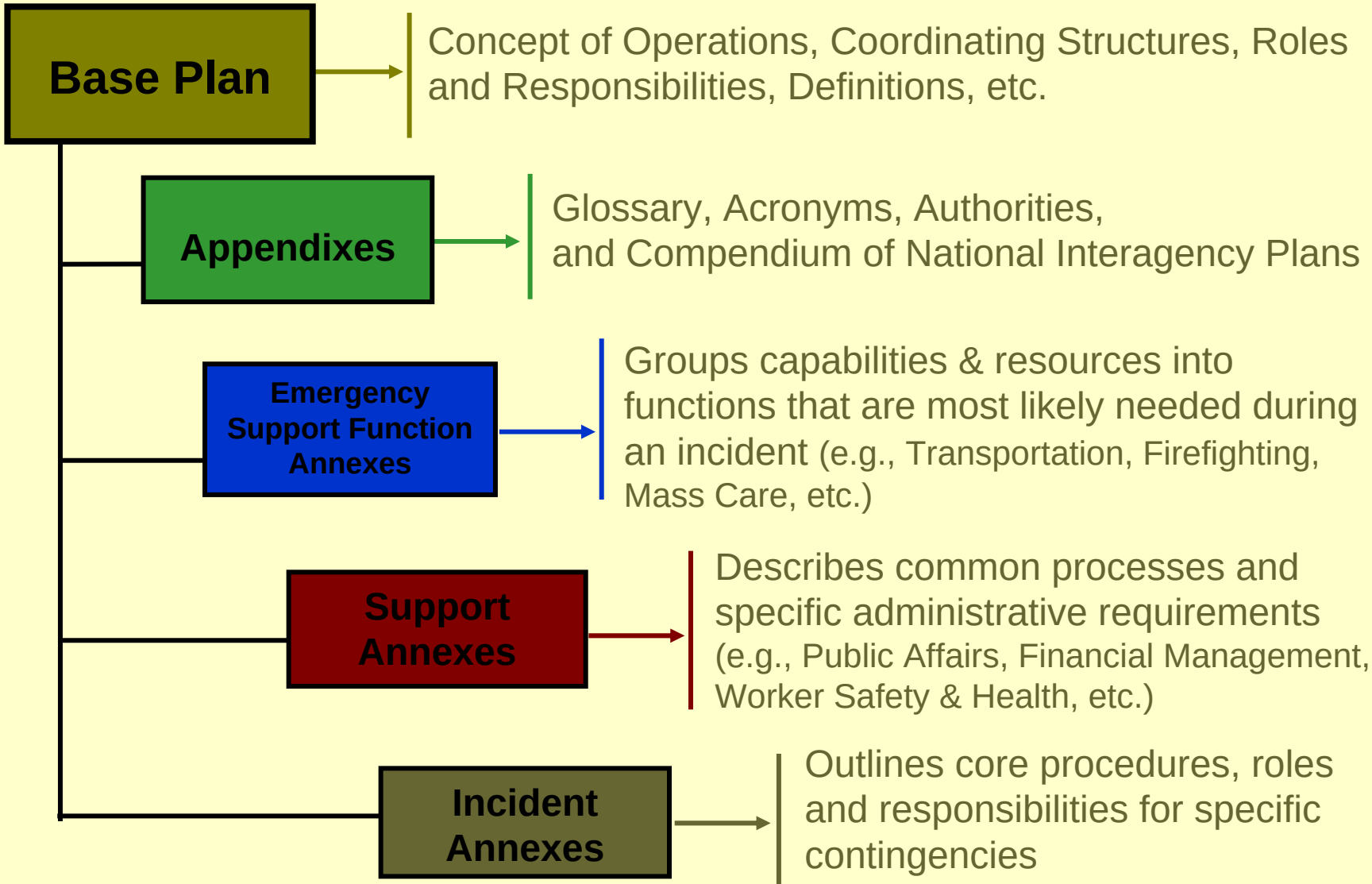
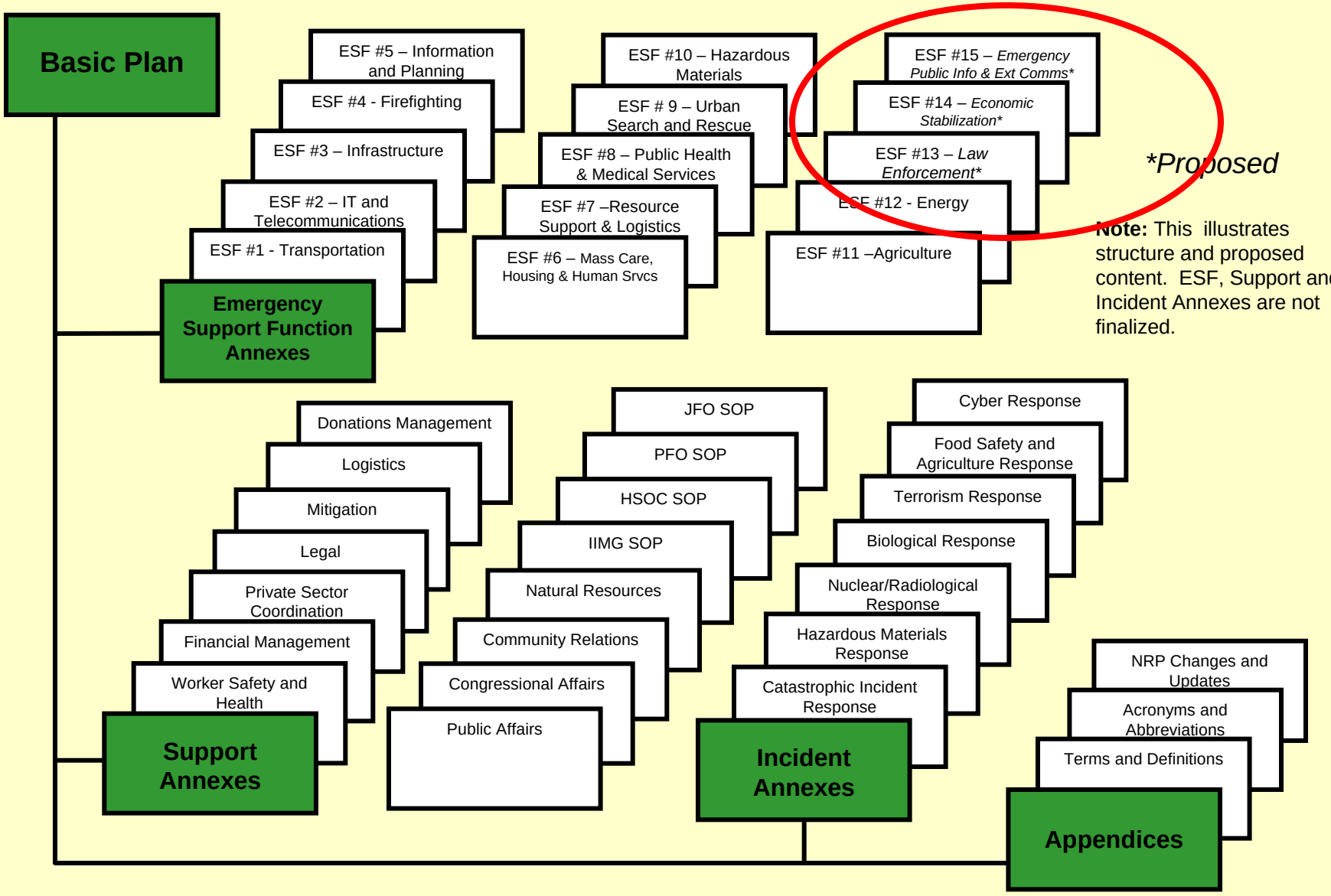
- National Response Plan
  - Pro-active template/guidebook
- Implement HSPD-5
  - Single comprehensive national approach
    - Prevention, Preparedness, Response and Recovery
  - Ensure all levels of government work together
    - National Incident Management System
    - Horizontal and vertical integration
    - Effective Communications
  - Integrate crisis and consequence management into a unified component

Organization of the NRP



Organization of the NRP



Support Annexes

- Financial Management
- International Coordination
- Logistics Management
- Private Sector Coordination
- Public Affairs
- Science and Technology
- Tribal Relations
- Volunteer and Donations Management
- Worker Safety and Health

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Incident Annexes

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- Biological Incident
- Catastrophic Incident
- Cyber Incident
- Food and Agriculture Incident
- Nuclear/Radiological Incident
- Oil and Hazardous Materials Incident
- Terrorism Incident Law Enforcement and Investigation

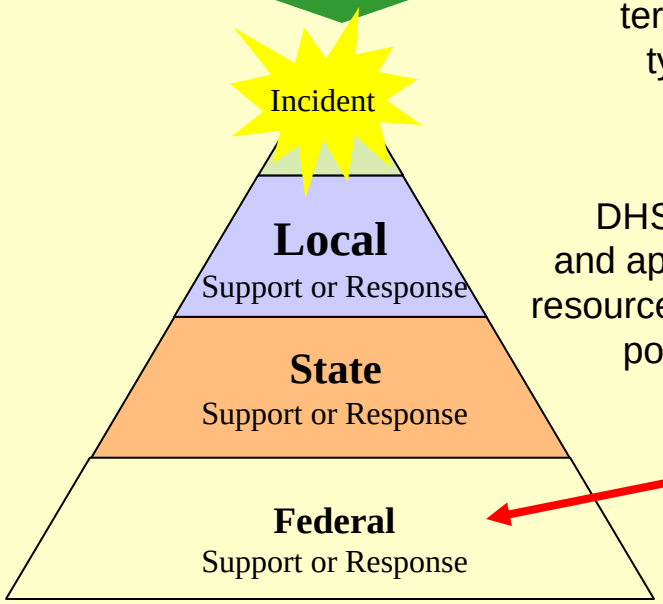
NRP Components

	Operational Coordination	Resource Coordination	Policy Coordination
National Level	Homeland Security Operations Center (HSOC)	National Resource Coordination Center (NRCC) [formerly NEOC EST]	Interagency Incident Management Group (IIMG)
Regional Level	Regional Homeland Security Operations Center (RHSOC)	Regional Resource Coordination Center (RRCC) [formerly ROC]	Regional Interagency Incident Management Group (RIIMG)
Field Level	Joint Field Office* and EOCs [*formerly DFO]	JFO and EOCs	JFO and EOCs

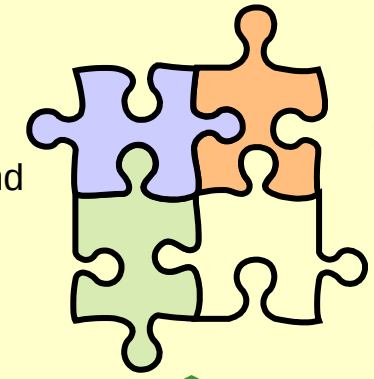
NIMS & NRP Relationship

National Incident Management System (NIMS)
Standardized process and procedures for incident management

NIMS aligns command & control, organization structure, terminology, communication protocols, resources and resource typing to enable synchronization of efforts in response to an incident at all echelons of government



DHS integrates and applies Federal resources both pre and post incident



Resources, knowledge, and abilities from independent Federal Depts & Agencies

NRP is activated for
Incidents of National Significance

National Response Plan (NRP)
Activation and proactive application of integrated Federal resources

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Problems with NIMS and NRP

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- NIMS
  - organization and span of control within top-down paradigm
  - But information flow is bottom-up
    - “fat-fingered” entry
    - “Soap on a rope”
- NRP
  - Simulates more boxes, faster but doesn’t get you “out of the box”
- Medical plan is parallel but different
- What will happen with “firehose” of information?
  - When overloaded people fall back to what they know and are comfortable with

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Disaster Management Technology

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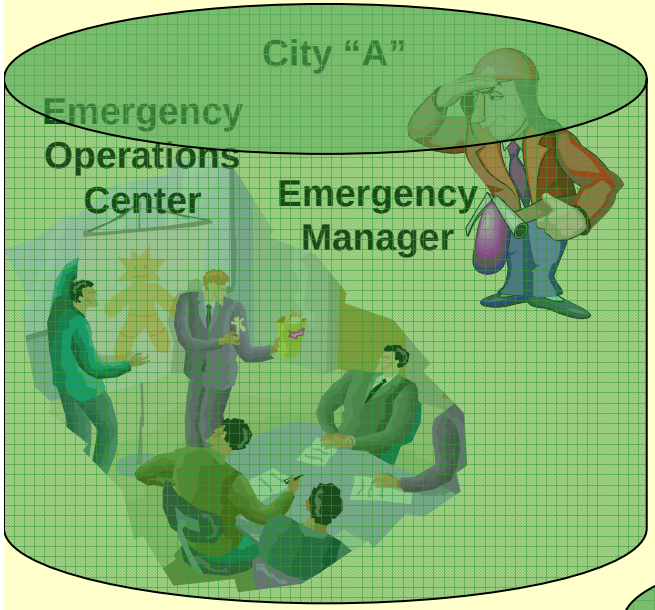
Goal 1: An easy to use, unified point of access to Disaster Management knowledge and services.

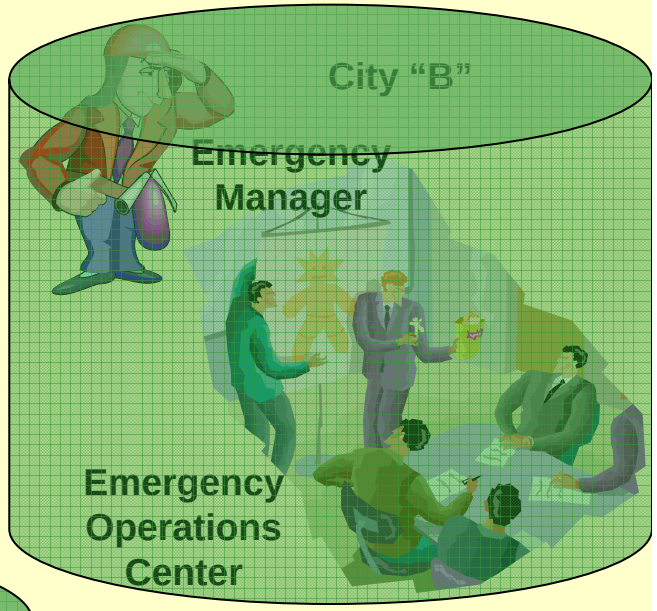
Goal 2: Accelerated and improved quality of disaster mitigation and response.

- Minimize loss of life and property
  - Prepare
  - Mitigate
  - Respond
  - Recover
- Provide consolidated source of disaster-related information and services (www.disasterhelp.gov)
- Establish information interoperability infrastructure
- Leverage existing assets
- Streamline disaster-related processes
- "Bottom up": responder/stakeholder driven requirements

What's the first problem?



Organization to organization interoperability tends to be inefficient



"Pass the rumor telephone chaos."

FAX hassles

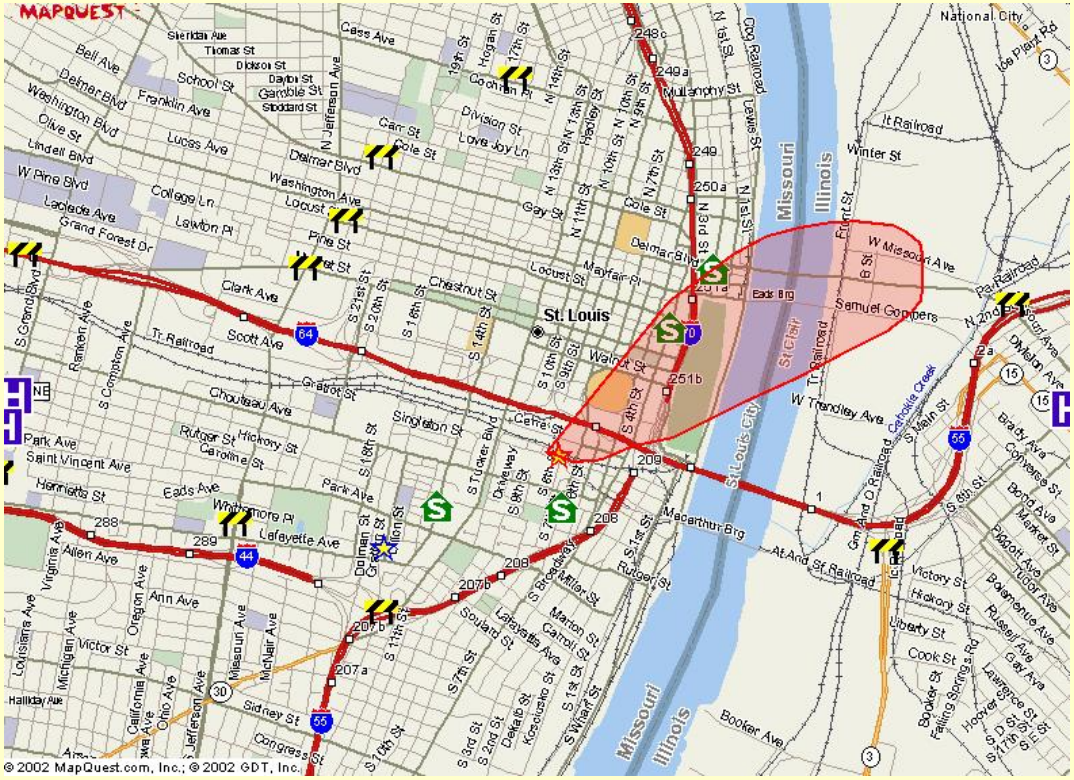
"Grease pencil and acetate"

"Same room syndrome"

What's that mean in the real world?

Consider:

- **St Louis Riverfront Festival, July 4**
- **Terrorist rocket into chlorine tank car**
- **Lethal plume across:**
  - **Unprotected thousands**
  - **Multiple municipal jurisdictions**
  - **2 states**
  - **2 FEMA regions**



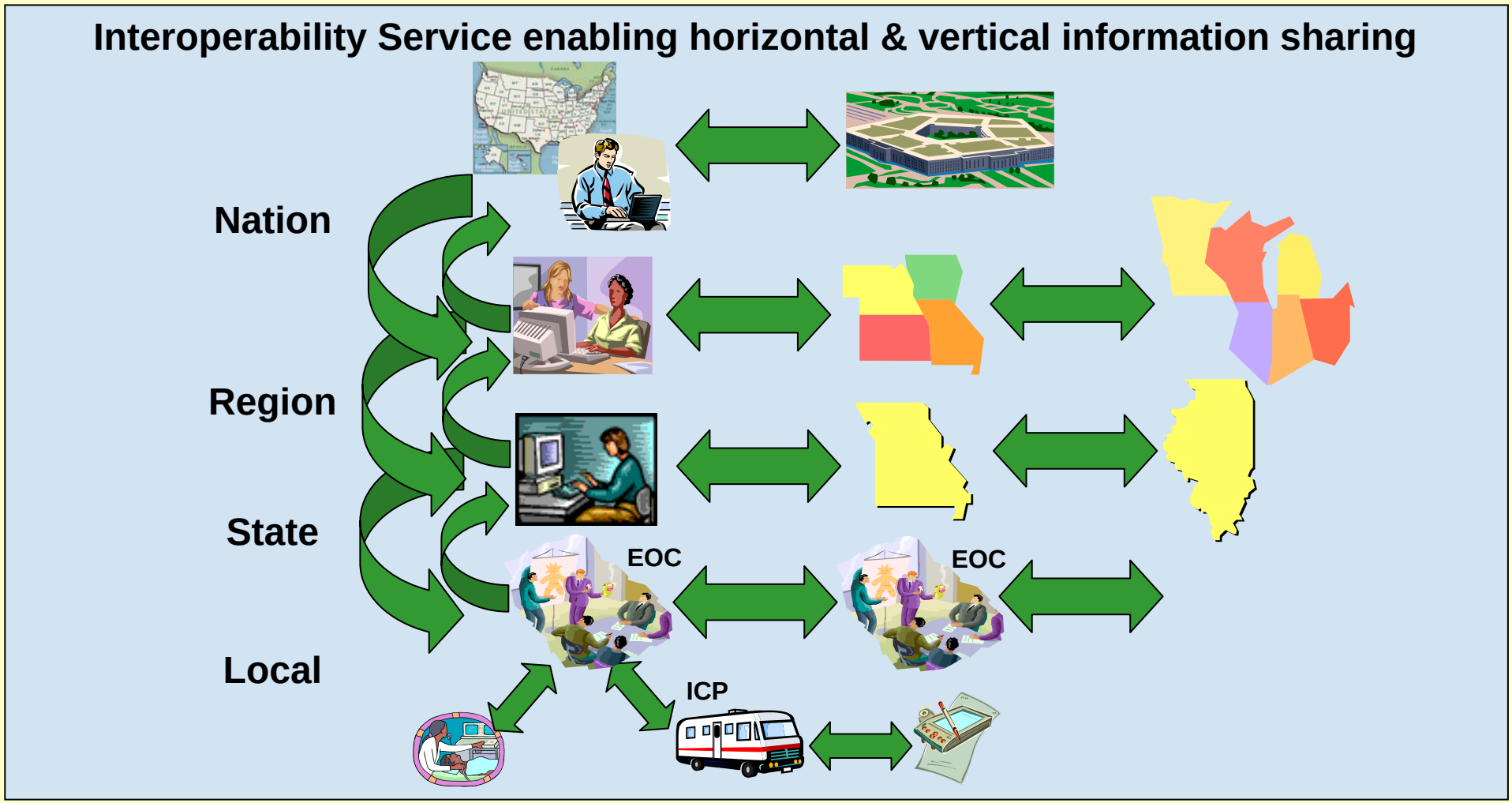
With an interoperability service, organizations can:

- **Share information**
- **Gain early awareness**
- **Coordinate response**
- **Save lives and minimize property damage**

Despite differing automated systems

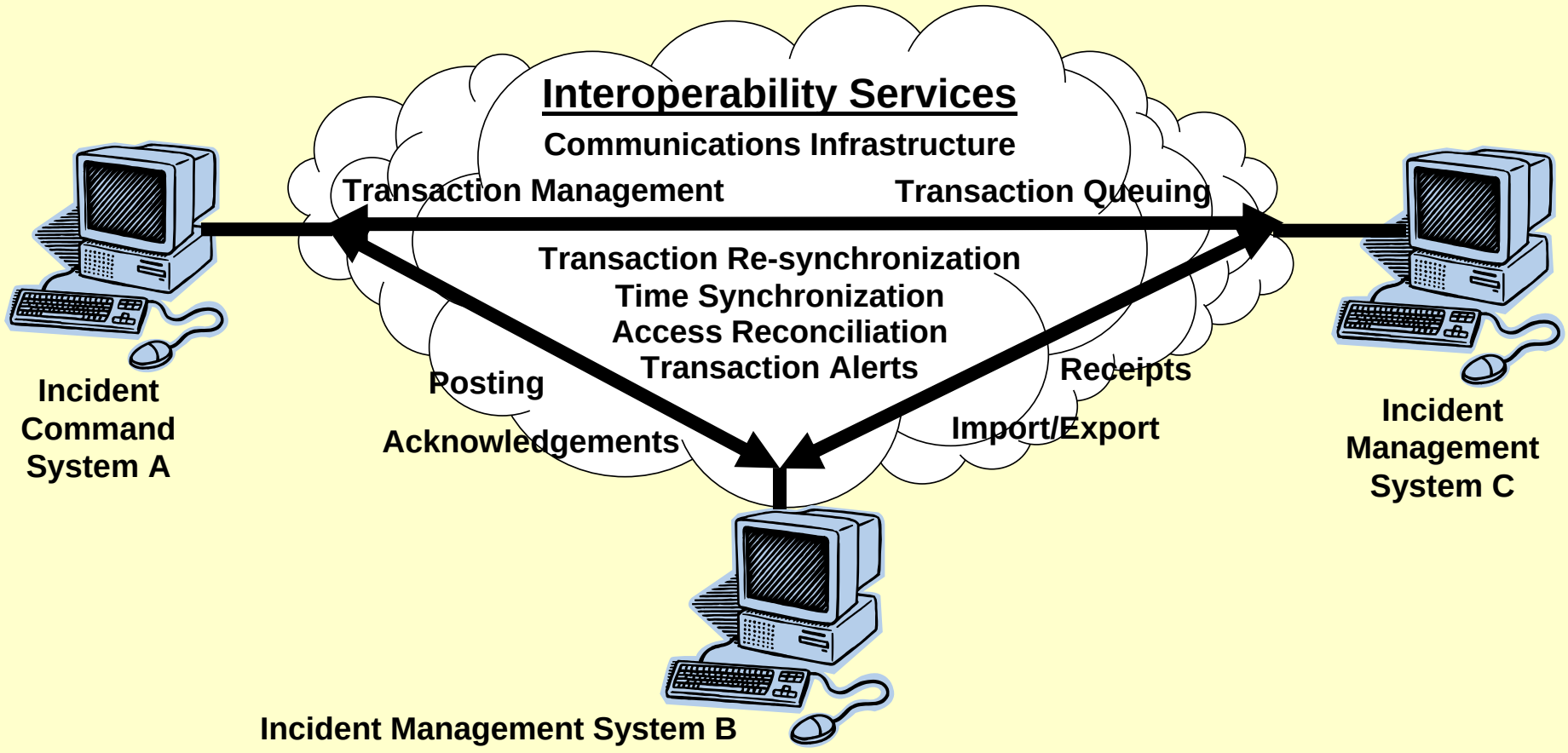
What's the solution?

- Leverage technology to gain efficiency
- Develop a national emergency information interoperability service



What's an Interoperability Service?

An infrastructure with common service functions that enable heterogeneous automated information systems to "talk to each other."

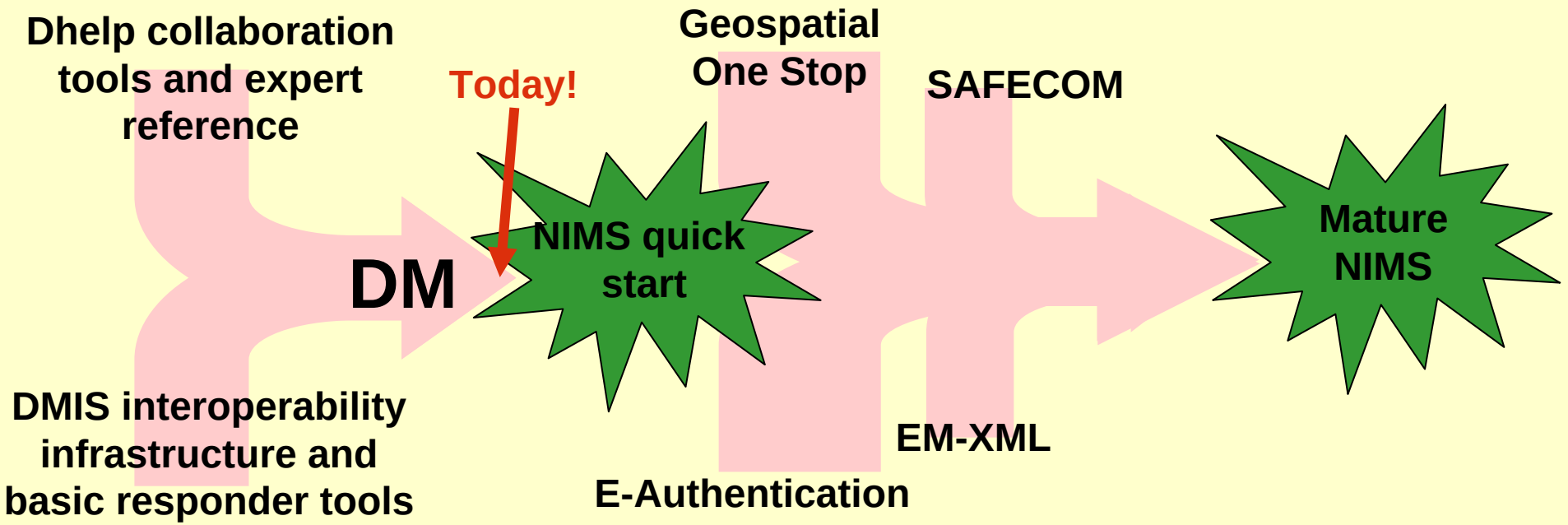


Metrics- Saving Lives and Property

Goal	Mission Need	Key Performance Parameters	Tangible Outcomes*
1 & 2	Block 1: Knowledge Management, Responder Application Basic Tools, and Level 1 Interoperability	• Reduce response/recovery time by a threshold of 15% with Objective of 25%	**Phase 1:** •Specific Needs Request •Weather Forecast •Alerts •Open-Source Intel Plus •Threaded Discussions •Subject Matter Expert Tracking •Level 1 Presentable Interoperability **•Phase 2:** •Agent Identifier •On-line Mapping •Target Folder •Playbook •Lessons Learned Repository •White-boarding •Level 2 Reportable Interoperability
1 & 2	Block 2: Responder Applications Advanced Tools and Level 2 Interoperability	• Improve situation awareness & planning capability with a threshold of 25% and objective of 50%	•On-Scene Video •On-Scene Sensor Integration •Secure Wireless Access •EOD M&S Tool (Blast FX) •Level 3 Processable Interoperability
1	Block 3: Citizen Services	• Simplified application process for citizens with threshold of 3 forms and objective of 1.	•Combined resources of federal agencies for citizens •Single on-line form processing for grants

*** Not all-inclusive**

In response to HSPD-5, converging roads to NIMS technologies.



Government / science / industry collaboration developing technologies for homeland security

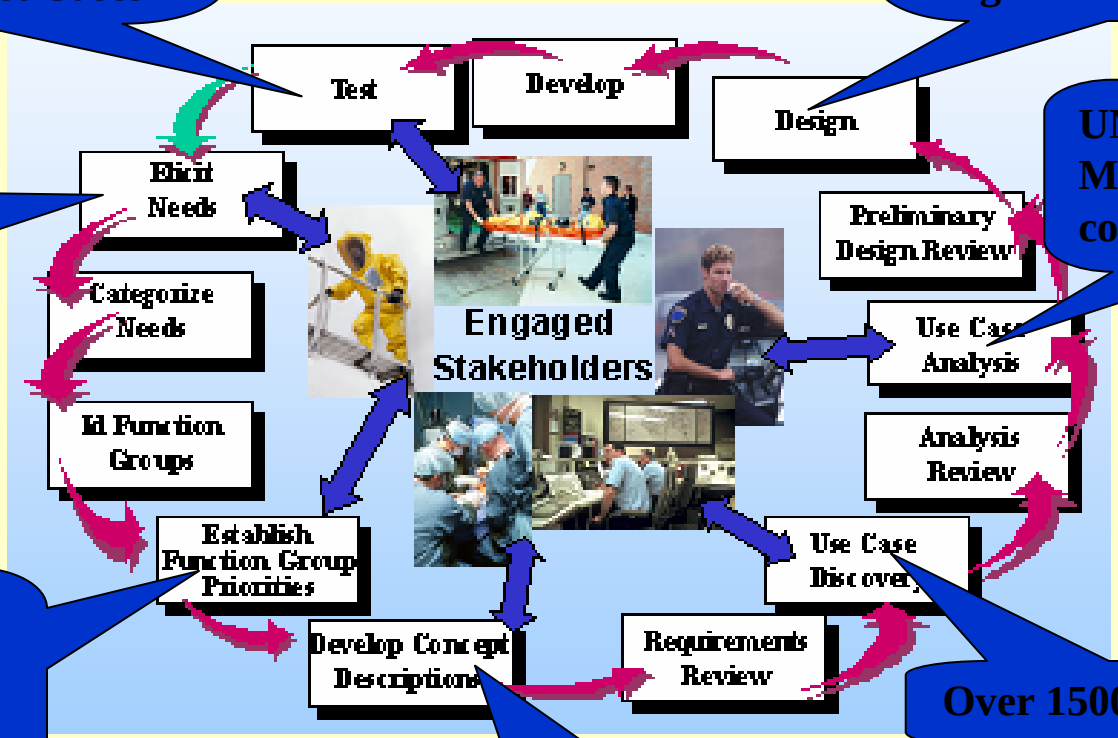
Rational Process/Stakeholder Experience

Beta Testing:
Cities: LA, Dallas, Seattle
States: IL, MA, NH
- 50 Application Test Cases

- Roughly 500 Robustness Diagrams
- Over 300 Sequence Diagrams

1,000 formal responder interviews

UML Domain Models for each component



• 3 formal responder surveys
•Regular advisory body prioritization

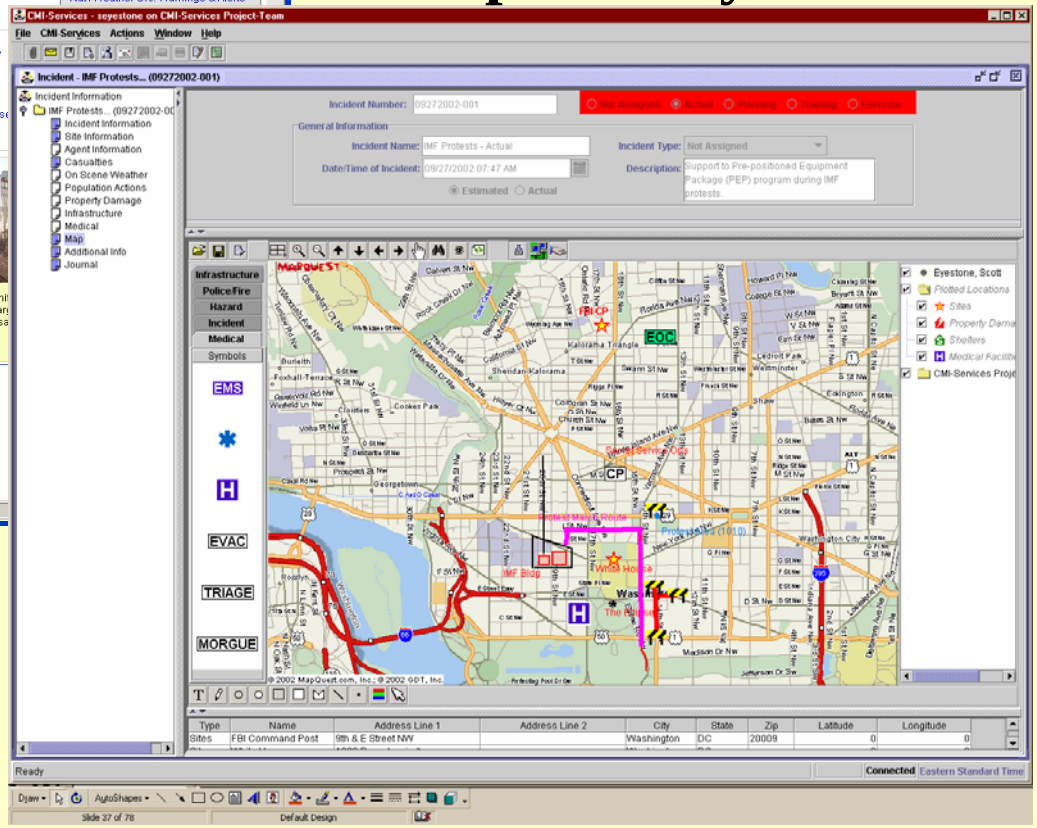
Roughly 50 functional concept descriptions

Over 1500 use cases

Current DM Capabilities

DisasterHelp.gov

Disaster Management Interoperability Services



DM Current Capabilities

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- Shared situation awareness tools, including interactive maps
- Open-source intelligence (OSInt)
- Private chat for responders
- Collaborative workspace with instant-messaging (IM), chat, document repository
- Data center / communications / access control / security / privacy
- 24x7 help desk / program support
- Transaction queuing during communication loss
- Prototype web-based access to DMI-Services
- Disaster information portal with search
- Threaded discussions

Reality Check

- Gasparilla
  - Fat finger entry (15 people, fax machine)
    - 1 person to correct errors
    - Expectation that one or two people to manually record on paper, then enter later
  - Radio interoperability relies on “tweaking”, infamous connector/adaptors, deep knowledge
  - Software programs don’t talk to each other
    - Usually can’t handle multiple incidents
  - Paper map and protractor cited as best tool
    - Manually transfer results from projection software to map with street names on it

Situation Room

Administrivia
ER overview
NIMS
Incident NS
NRP
Disaster Mgt
Discussion
Review

Planned Capabilities

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- External systems interfaces - interoperability API
- Specific Needs Request
- Agent Indicator
- Desktop video teleconferencing
- Detailed weather forecasts for responders
- Target Folder
- Playbook
- Webify current client-server application (interactive mapping tool)
- Enhanced portal access control
- Web-services mapping
- Secure wireless access
- Alert notifications
- Electronic information campaigns

All are “bottom-up” responder-driven requirements

ER

Future Capabilities

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- Lessons Learned Repository
- On-scene Video
- Handheld Agent Indicator
- Weapons of Mass Destruction (WMD) Planning Tool
- Intelligence Reports (INTRep) (unclassified)
- Access to chem/bio weapons encyclopedia (BACWORTH)
- USDA Report Forms
- Sensor Interfaces
- Health Alert Network Interoperability
- Enhanced mapping Interoperability
- Distributed Exercises
- Agro-terrorism Database
- Blast FX- Tool for simulation of structure explosion
- Subject matter expert query capability

All are "bottom-up" responder-driven requirements

Discussion

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- Is information technology the only technology needed for disaster management? The most important?
- What assumptions about technology are being made?

Review

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- What are the four phases of incident management activities?
  - Prevention, preparedness, response, recovery
- NIMS stands for
  - National incident management system
- NRP stands for
  - National response plan
- What is an incident of national significance?
  - Involves terrorism, catastrophic beyond state's ability to handle
- NIMS must be used for what kind of incidents?
  - *Hazmat* (even if local) and *incidents of national significance*
- Disaster management technology focuses on
  - Information technology for incident command