



“WIPP Disaster Recovery and Restart: Emergency Management Improvements”

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Introduction - Bio



- More than 20 years of experience in emergency management, security operations and homeland security within the private and government sectors. My experience includes managing nuclear, non-nuclear and underground emergency preparedness programs; multi-jurisdictional drill and exercise programs; hazardous identification and analysis; and emergency facilities and equipment. I also have experience managing protective force and fire departments.
- Prior to joining LANL, I worked at the U.S. Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) for almost 3-years where I managed the Emergency Management and Security Department, which included Emergency Management, Fire Department, and Protective Force. This was a very challenging assignment due to the fire and radiological release that occurred underground, which stopped all waste emplacement operations and became a national priority to re-open. The WIPP disaster not only impacted the nuclear facility, but impacted sites across the nation that need to dispose of transuranic radiological waste.
- Before joining WIPP, I spent 12.5-years at the U.S. DOE Nevada National Security Site (NNSS), which is about 1,200 square miles of national security mission space, to include nuclear and non-nuclear facilities, both above ground, underground, and tunnels. I managed the Emergency Management Department, but also worked in the trenches as a Duty Manager for the 24/7 Operations Command Center, Senior Exercise Planner, and Emergency Management Coordinator at designated nuclear facilities.
- I'm a Certified Emergency Manager through the International Association of Emergency Managers and have a master's degree in emergency management from Jacksonville State University, which is complemented by a bachelor's degree in business management.

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Overview

- The presentation will discuss the two major incidents that occurred at the Waste Isolation Pilot Plant (WIPP) in February 2014, which included an underground fire and a thermo-deflagration of a transuranic radiological waste drum, releasing radiological material to the environment and contaminating some parts of the mine.
- The two incidents occurred within a two-week period, and caused a long road of recovery and restart activities. Although WIPP had to recover most of their Safety Management Programs, such as Fire Protection, Maintenance, Work Planning, Radiological Control, etc., this presentation will focus on the intensive recovery of the Emergency Management Program, which had to rebuild confidence that the site had the capability to protect workers, public, property, and environment from all hazards.
- The presentation will highlight the need to invest into emergency management as a priority, the importance of being prepared for small and large incidents, and the need to follow your emergency plans and procedures for a good outcome.



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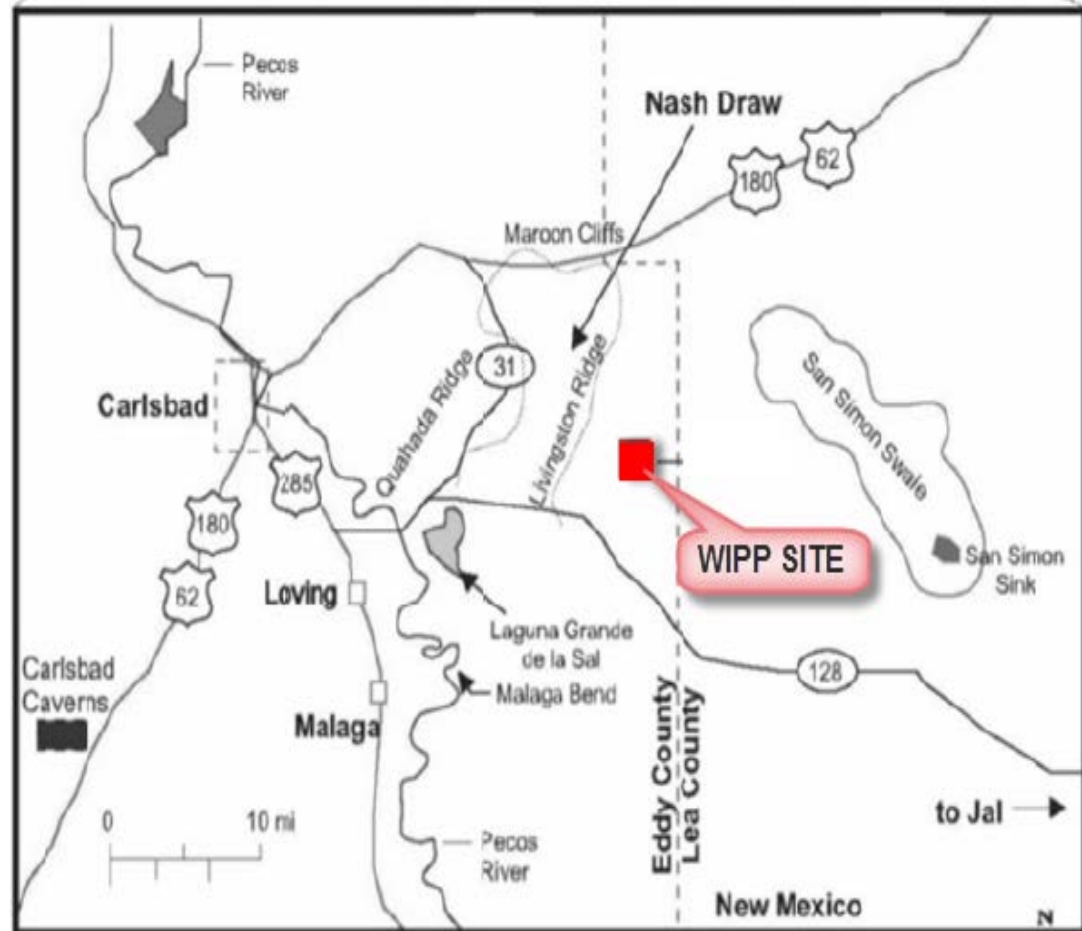
Key Program Drivers

- ***Department of Energy Order 151.1c Comprehensive Emergency Management System***
 - DOE O 151.1c “The Emergency Management System provides the framework for development, coordination, control, and direction of all emergency planning, preparedness, readiness assurance, response, and recovery actions”.
- ***National Incident Management System (NIMS)***
 - NIMS represents a core set of doctrines, concepts, principles, terminologies, and organizational processes to enable effective, efficient, and collaborative incident management at all levels or tiers. It is not an operational incident management or resource allocation plan.

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Location

- **50 mi. from Artesia, NM**
- **45 mi. from Hobbs, NM**
- **25 mi. from Carlsbad, NM**
- **20 mi. from Loving, NM**



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WIPP Mission



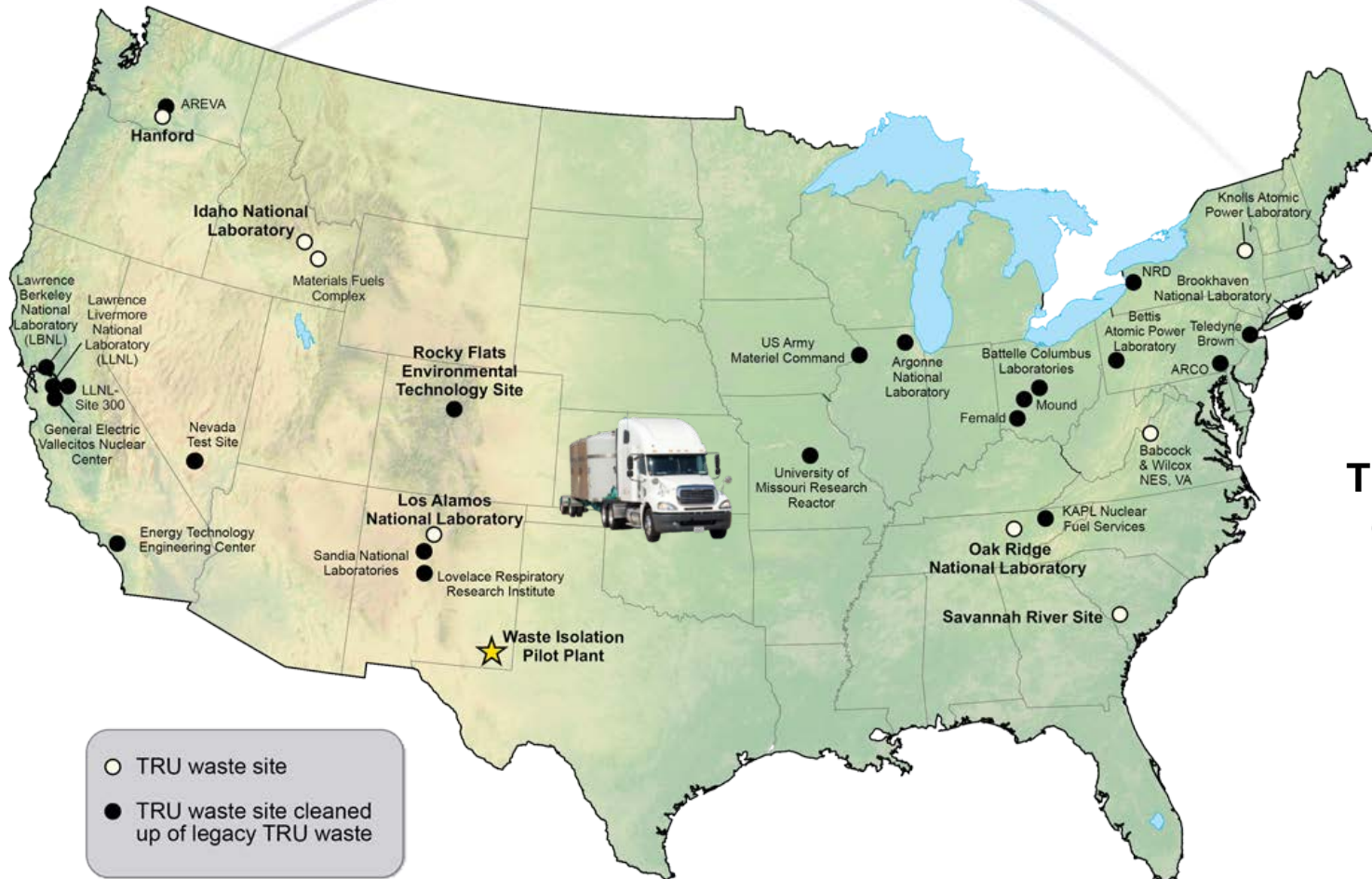
Quick Facts (as of Feb. 23):

- **Opened: March 26, 1999**
- **11,894 shipments received**
- **91,053 cubic meters of waste disposed**
- **171,176 containers disposed in the underground**
- **Over 7.5 miles of accessible areas of the underground**

WIPP is America's only deep geologic repository for the permanent disposal of defense-generated transuranic (TRU) radioactive waste left from research and production of nuclear weapons.

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National Cleanup



Total number
TRU waste sites
cleaned up of
legacy TRU
to date:

22

- TRU waste site
- TRU waste site cleaned up of legacy TRU waste

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Underground Fire, 2014

- **February 5th, 2014 – Underground Fire**
 - Diesel powered salt-haul truck fire prompts evacuation of the underground facility.
 - All underground personnel safely evacuated.
 - Six workers taken to local hospital with smoke inhalation and released by the next day.
 - Waste handling operations suspended. Access to the underground was limited to preserve the scene for investigation
 - Smoke damage was sustained to the exhaust filters and waste hoist tower
 - Zero release of radiological material as a result of the fire.
 - There was no hazard to surface workers, the public or environment
 - Investigators determine the fire originated in truck's engine compartment when hydraulic fluid or diesel fuel contacted hot surfaces on the truck



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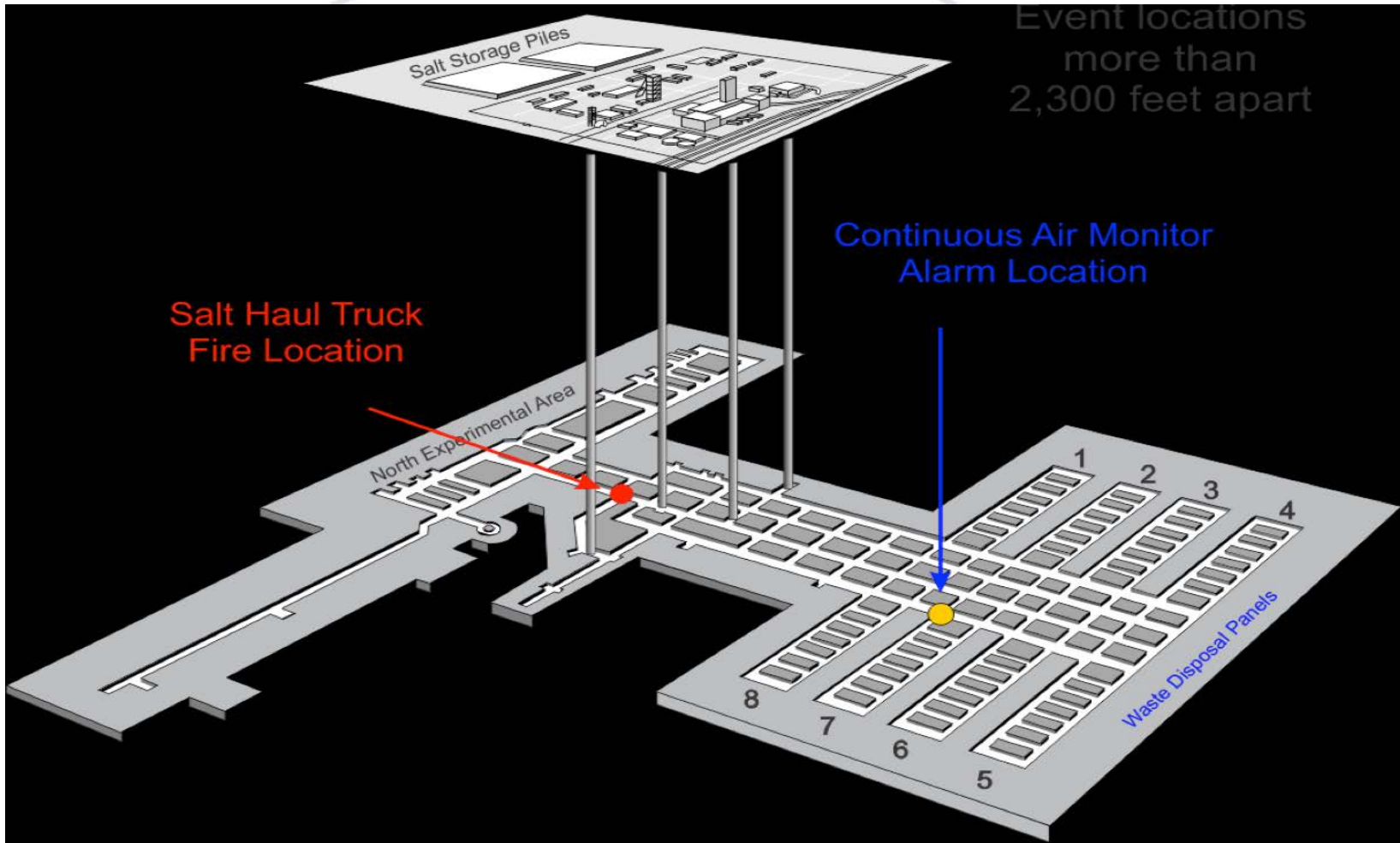
Radiological Event, 2014

- **February 14th, 2014 – Radiological Event**
 - Container failure in the underground, resulting in small radioactive material release at the WIPP site
 - Some contamination was released to the environment
 - Suspension of underground operations/shipments occurred
 - No employees were underground due to fire event. 22 site workers received low dose exposures
 - Extensive radiological sampling and monitoring determine there was no hazard to the public or environment
 - Accident Investigation Board conducted and published two accident investigation reports
 - Investigators determine that incompatible materials (Nitrate Salt, Organic Absorbent) in a single waste drum created a chemical reaction causing the drum to breach



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History - February 2014 (continue)



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What caused these events?

- **Accident Investigation Board (AIB)**

Underground Fire Event

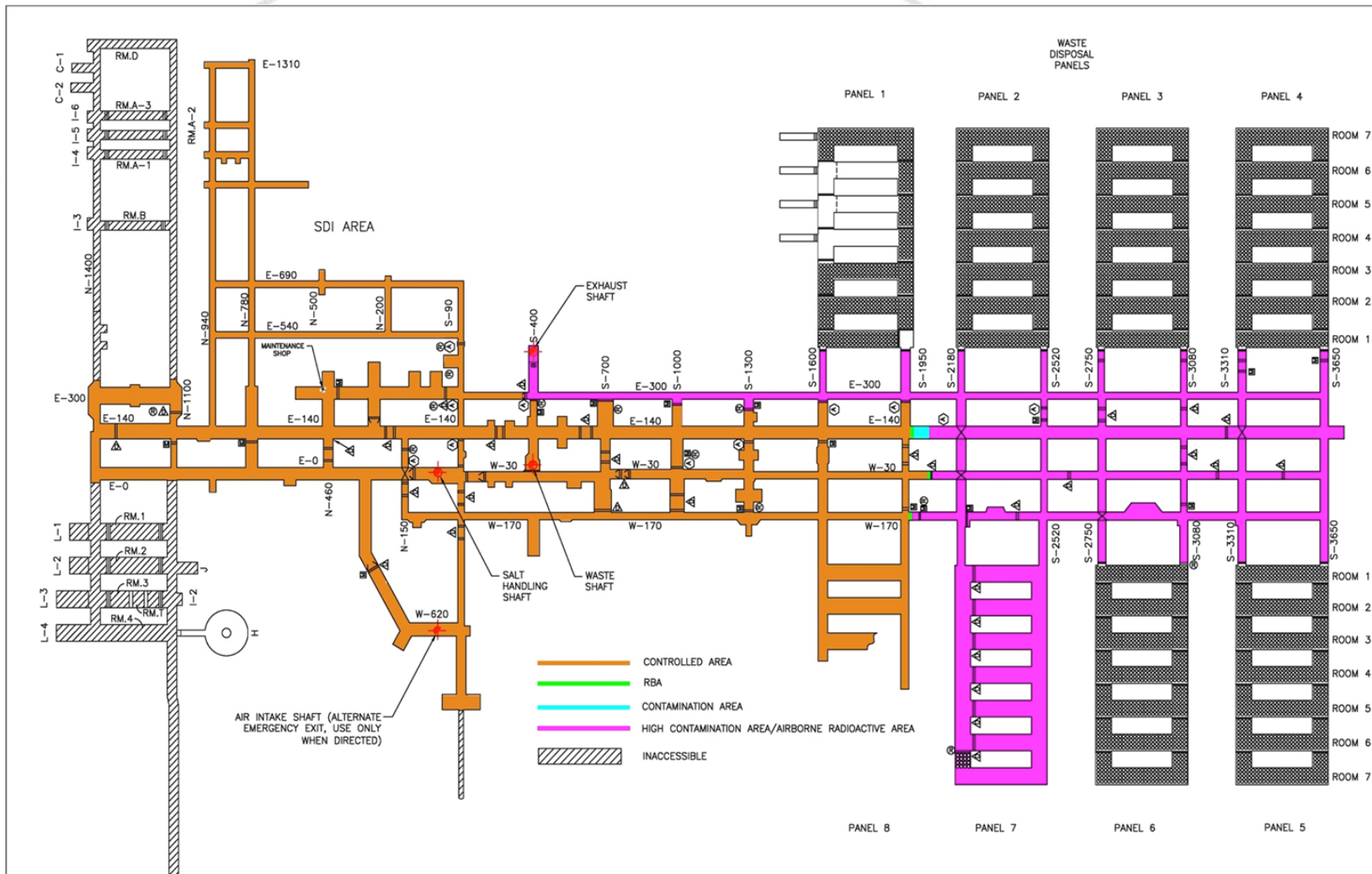
- **Direct Cause:** contact between flammable fluids and hot surfaces which resulted in a fire

Radiological Event

- Phase I -- focused on the release of radioactive material from the underground and follow-on response actions
 - Root Cause: inadequacies in ventilation system design and operability compounded by **degradation of key safety management programs** and culture
- Phase II -- focused on the direct cause of the release
 - Direct Cause: Exothermic reaction of incompatible material in a LANL waste drum

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Underground



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Disaster Recovery

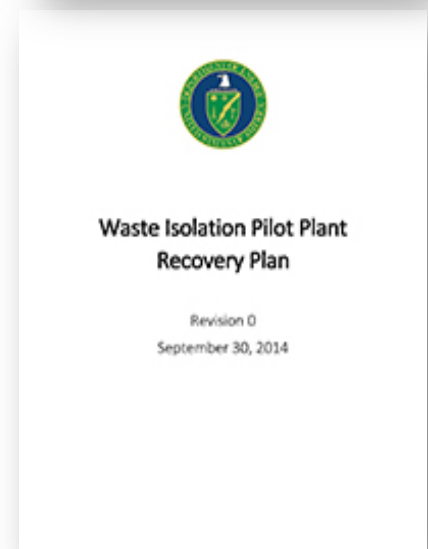
- **What does disaster mean?**

An event or fact that has unfortunate consequences.

A sudden event, such as an accident or a natural catastrophe, that causes great damage or loss of life.

- There was no loss of life, but significant consequences to include impacts to:

- Operations (waste emplacement)
- Social/Political/Economical
 - ✓ Behavior changes by employees and community members
 - ✓ Reduced trust by community, political figures, and other stakeholders
 - ✓ Reduced corporate profits and reputation
 - ✓ Increased revenue in local community, but significant increase in tax payer money needed for recovery
- Waste generators across the nation



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Disaster Recovery (continue)

- **Response and Coordination and Short-Term Recovery**
- *The response to the radiological incident was considered a major failure. AIB Report: “degradation of key safety management programs.”*
- **Long-Term Recovery Phase**
 - Appointed experienced Recovery Manager
 - Developed comprehensive recovery plan and schedule
 - Recovery initiated of safety basis, nuclear safety culture, and Safety Management Programs
 - **Focus:** Revitalization of a comprehensive Emergency Management Program



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The Vision – Looking Back

“Excellence in Emergency Management”

- Implement sound interim measures to ensure current emergency management program sustainability, while developing a new enhanced Emergency Management Program
- Work toward a “best-in-class” Emergency Management Program, applying continuous improvements
- Restart Waste Emplacement Operations



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Recovery Barriers/Risks

Managing and proactively mitigating barriers and risks was critical to meet aggressive recovery and restart deliverable dates.

Barriers/Risks:

- Underground Firefighting Policy.
- Two concurrent recovery plans and schedules (Emergency Management/Baseline Needs Assessment).
- Resource Conservation and Recovery Act (RCRA) permit and contingency plan requirements, and a diverse set of regulatory agencies (DOE, MSHA, NMED, etc.).
- Prioritization of emergency management tasks versus other recovery activities.
- Resource timing and availability.
- Funding reductions or barriers.
- Procurement issues resulting in delays.
- Staff skills and abilities for long-term sustainment.
- Cyber-security approval of new technology enhancements.
- Facility and equipment sustainability.
- Significant increase in external/independent assessments (DNFSB, EA-33, EM-44, etc.)



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Emergency Management Goals

- **Goal 1:** Sustain and enhance the existing Emergency Management Program.
- **Goal 2a:** Implement interim Emergency Management Program Improvements.
- **Goal 2b:** Implement sustainable Emergency Management Program Improvements.
- **Goal 3:** Enhance emergency management staff skills, knowledge, and abilities.
- **Goal 4:** Design and implement a new Emergency Operations Center (EOC) and structure, applying an all-hazards approach.

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Phase I, Immediate

Goal 1: Sustain and enhance the existing emergency management program.

- Revise existing emergency procedures. There was a significant number of procedures, complicating understanding of response protocols (micro-hazard response versus all-hazard approach).
- Conduct EOC and field emergency management drills.
- Implement an Abnormal Condition Drill Program.
- Enhance emergency notification processes.
- Develop and conduct categorization and classification training.
- Develop an interim ICS/NIMS ERO Structure.
- Conduct an independent comprehensive emergency management assessment (15 Program Elements)
- Conduct ICS training and drills.



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Status of Independent Assessment

- The Independent Assessment was conducted during the period of July 14, 2014, through July 24, 2014. Assessment based on 15 DOE Program Elements.
- ✓ Independent Assessment identified a total of sixty-three (63) findings. There were seven (7) noteworthy practices.



Table 1, Quantitative Summary of Noteworthy Practices, and Issues

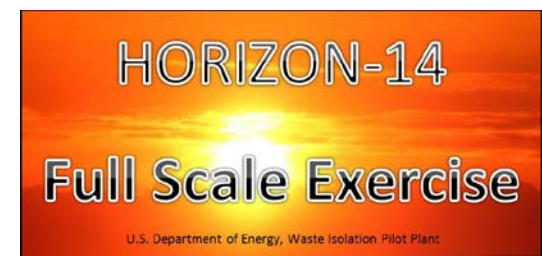
Program Element	Noteworthy Practices	Issues
Technical Planning Basis	0	4
Program Administration	1	2
Training and Drills	0	9
Exercises	0	4
Readiness Assurance	1	3
Emergency Response Organization	0	2
Offsite Response Interfaces	0	4
Emergency Facilities and Equipment	0	3
Categorization and Classification	0	3
Notifications and Communications	0	3
Consequence Assessment	0	4
Protective Actions and Reentry	0	14
Emergency Medical Support	0	4
Emergency Public Information	5	3
Termination and Recovery	0	1
Totals	7	63

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Phase II, Interim

Goal 2a: Implement interim Emergency Management Program Improvements.

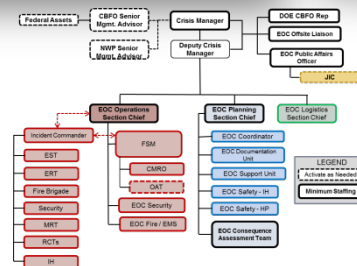
- Update Emergency Management Plan and associated procedures
- Develop an ERO Training and Qualification Program
- Develop EOC Activation and Operations Procedure and Position Checklists
- Enhance EOC equipment/systems
- Enhance underground emergency response procedures
- Implement a no-notice drill program. Collect data
- Develop strategy to transition Abnormal Operating Procedure steps from Emergency Management procedures
- Design EOC and establish a project schedule.
- Conduct a **Baseline Needs Assessment**
- Develop Offsite Interface Program
- Conduct Full Scale Exercise (Dec-14)
- Establish a Readiness Assurance Program



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Goal 2a (Major Milestone)

- EOC Enhancements (i.e. configuration, equipment, systems)
 - WebEOC, Communicator NxT!, Situation Boards, Laptops, etc.



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Baseline Needs Assessment Issue Summary

There were six significant findings in the Baseline Needs Assessment (BNA) and numerous recommendations. **These issues impacted emergency response capabilities.**

- **Issue 1:** Inadequate training and qualification for Emergency Services Technicians (Firefighters) and Emergency Response Team; training not in compliance with OSHA and NFPA codes and standards.
- **Issue 2:** Improper selection and commitment of standards for Hazmat, Technical Rescue, and Emergency Medical Services.
- **Issue 3:** Inadequate selection and commitment of standards for offsite emergencies.
- **Issue 4:** Insufficient staffing plan for appropriate emergency response needs and requirements.
- **Issue 5:** Ineffective implementation of National Incident Management System/Incident Command System (NIMS/ICS).
- **Issue 6:** Improper closure of previous recommendations with insufficient documentation and verification.

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Baseline Needs Assessment Program Goals

- **Goal 1:** Establish a regulatory compliant Fire Department and build upon current emergency response knowledge, skills and capabilities.
 - Established training milestones in the Fire Department Recovery Schedule to elevate all Fire Department firefighters to Firefighter I/II certifications to meet NFPA 1001 Standard
 - Established training milestones in the Fire/EMS Recovery Schedule to elevate Emergency Response Team training requirements to meet NFPA 600/1081 Standard
 - Established milestones in the Fire Department Recovery Schedule to develop Fire Department policies, procedures, and other support documents
- **Goal 2:** Increase Fire Department staffing to meet the minimum tasks for identified hazards.
 - Historical staffing: (3) Emergency Medical Technicians/2 Protective Force Fire Brigade Members
 - Plan: Increase to (8) Firefighters per shift, remove Protective Force as dual function
- **Goal 3:** Sustain program requirements, training and qualifications, knowledge and skills, and response equipment and apparatuses.
 - Established training milestones for development of continuing training and certifications for Fire/EMS and Emergency Response Teams.
 - Continuing Education Program for Emergency Medical Services, Rescue, and Fire Suppression
 - Procure emergency response equipment and apparatuses necessary to respond to site hazards.

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Goal 3 *(Major Milestone)*

- **Enhance Emergency Management staff skills, knowledge, and abilities.**
 - The emergency management staff previously in place was understaffed, and lacked significant emergency management experience (pedigree).
 - Hired the following key emergency management positions:
 - Emergency Manager
 - Senior Emergency Planner
 - Senior Emergency Planner
 - Senior Emergency Planner/COOP
 - Senior Exercise Planner
 - ERO Training Officer
 - Readiness Assurance Coordinator
 - Issues Management Coordinator
 - Emergency Management Drill Planner
 - EOC Watch Officer
 - Augmenting staff with emergency management subcontractor staff. There were some challenges:
 - Specific DOE experience was diverse, as well as quality
 - Managing significant resources, products, and deadlines without increase in Supervision



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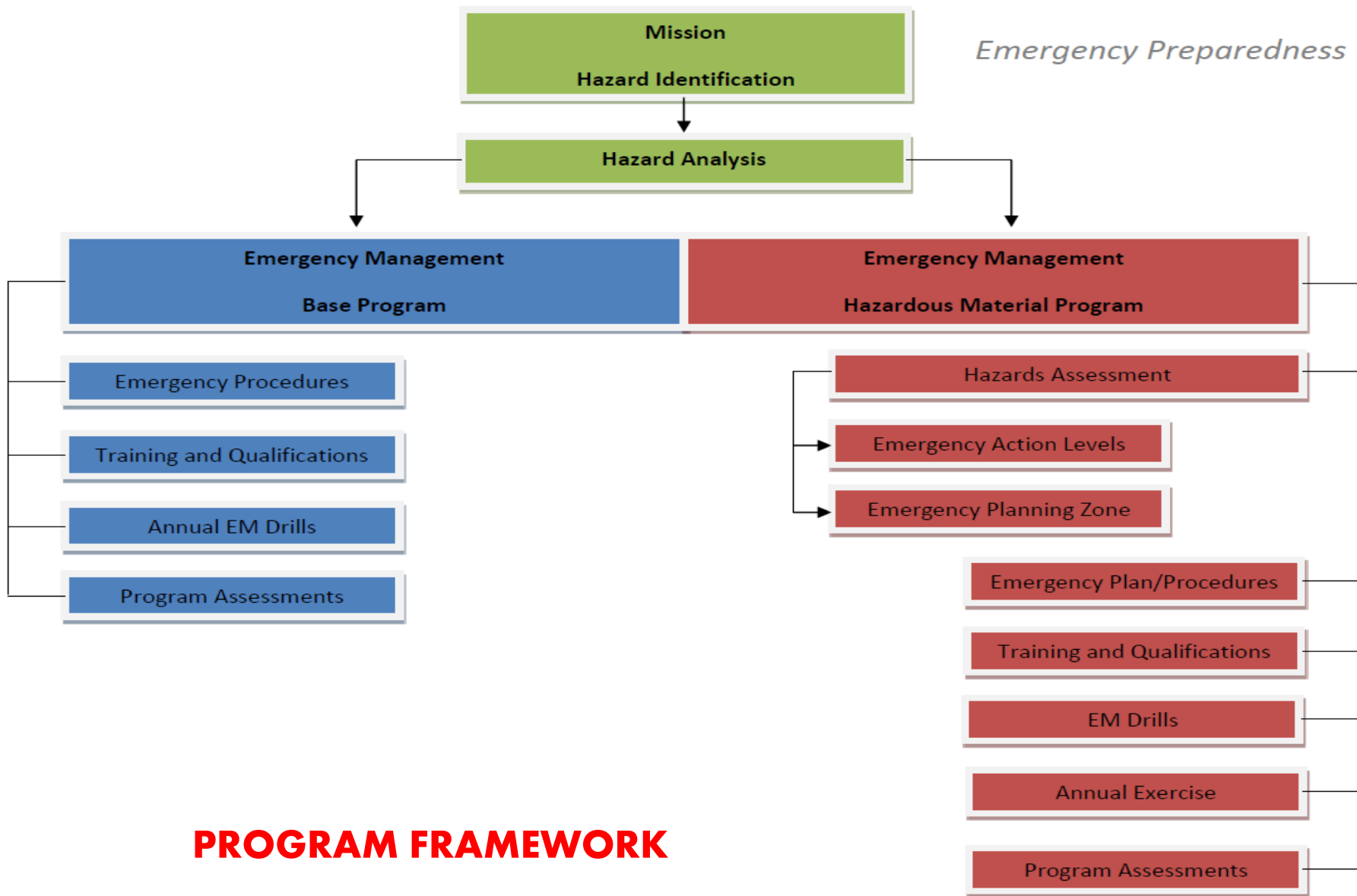
Phase III, Sustainment

Goal 4: Design and implement a new Emergency Operations Center.

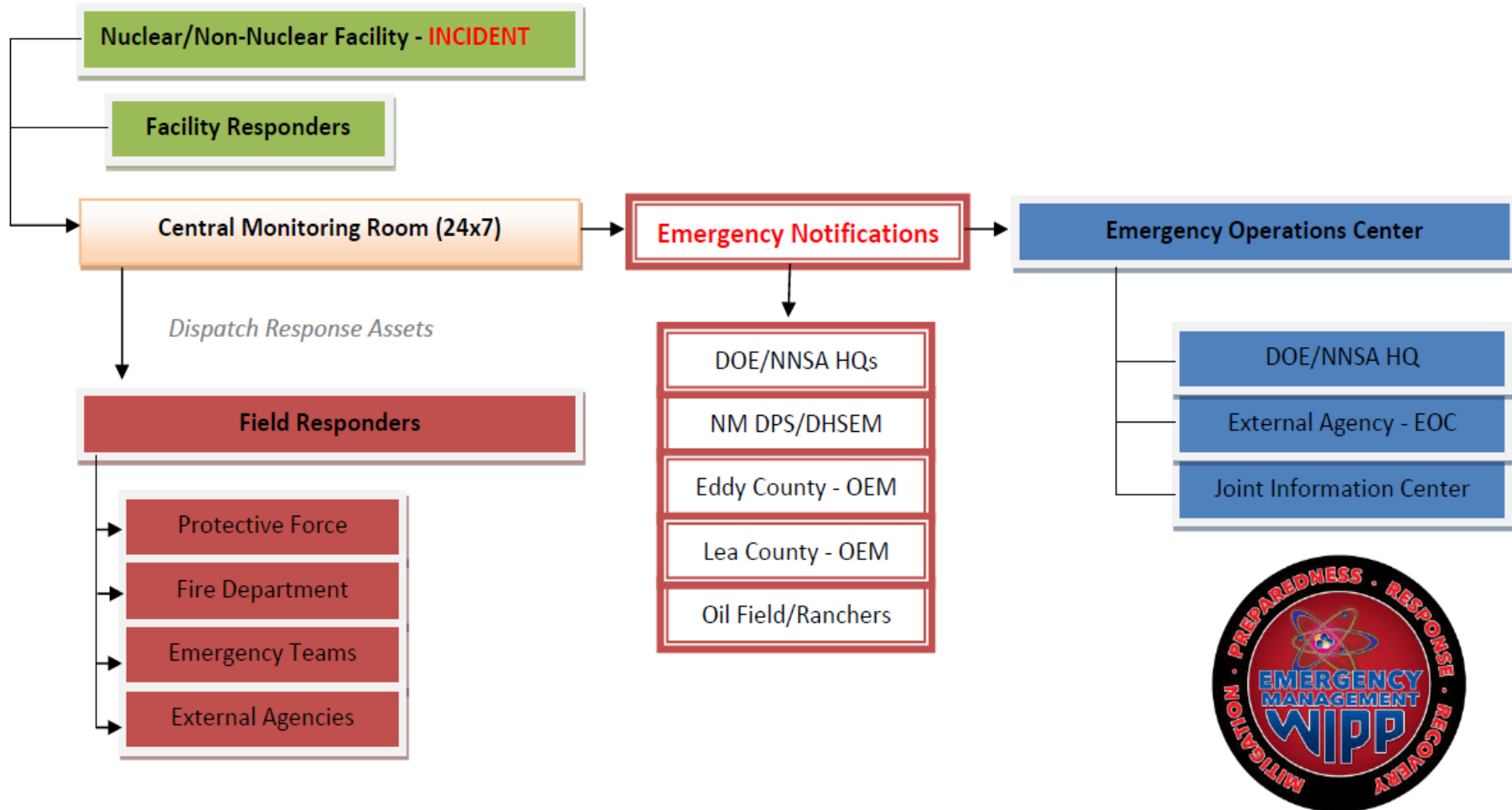
- Develop and implement a comprehensive and sustainable NIMS ERO Structure in EOC.
 - Update Emergency Plans, Procedures, and Checklists
 - Update Training and Qualifications
- Develop and improve technical support function.
- Develop radiological field team monitoring capabilities.
- Complete new EOC at Skeen-Whitlock Building.
- Resolve issues identified in the Baseline Needs Assessment
- Conduct comprehensive drills and exercises to test response capabilities.
 - Phase III allowed preparation for declaration of program health and pass key assessments:
 - Management Self-Assessment (MSA)
 - Contractor Operational Readiness Review (CORR)
 - Department Operational Readiness Review (DORR)



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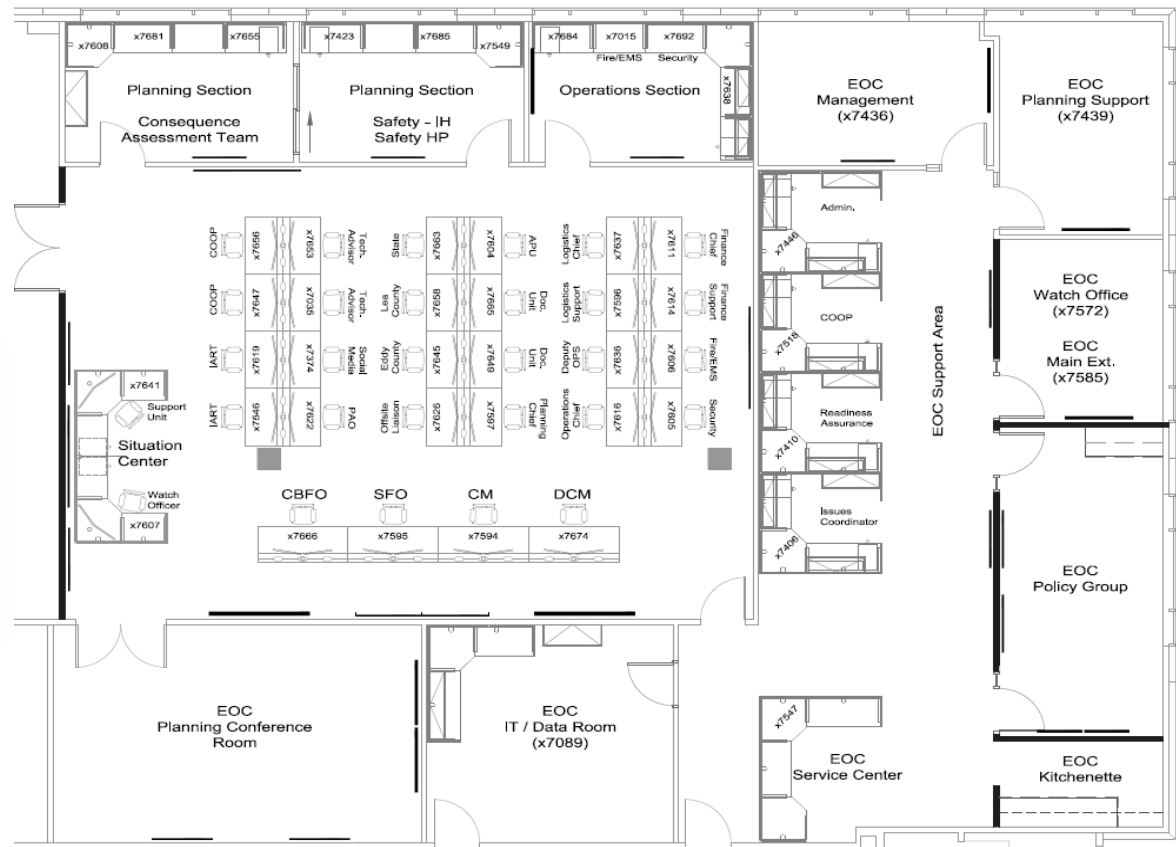
Emergency Response and Notifications



Goal 4 (continue) *(Major Milestone)*

- New Emergency Operations Center, with back-up capability at site.

CARLSBAD FIELD OFFICE EMERGENCY OPERATIONS CENTER



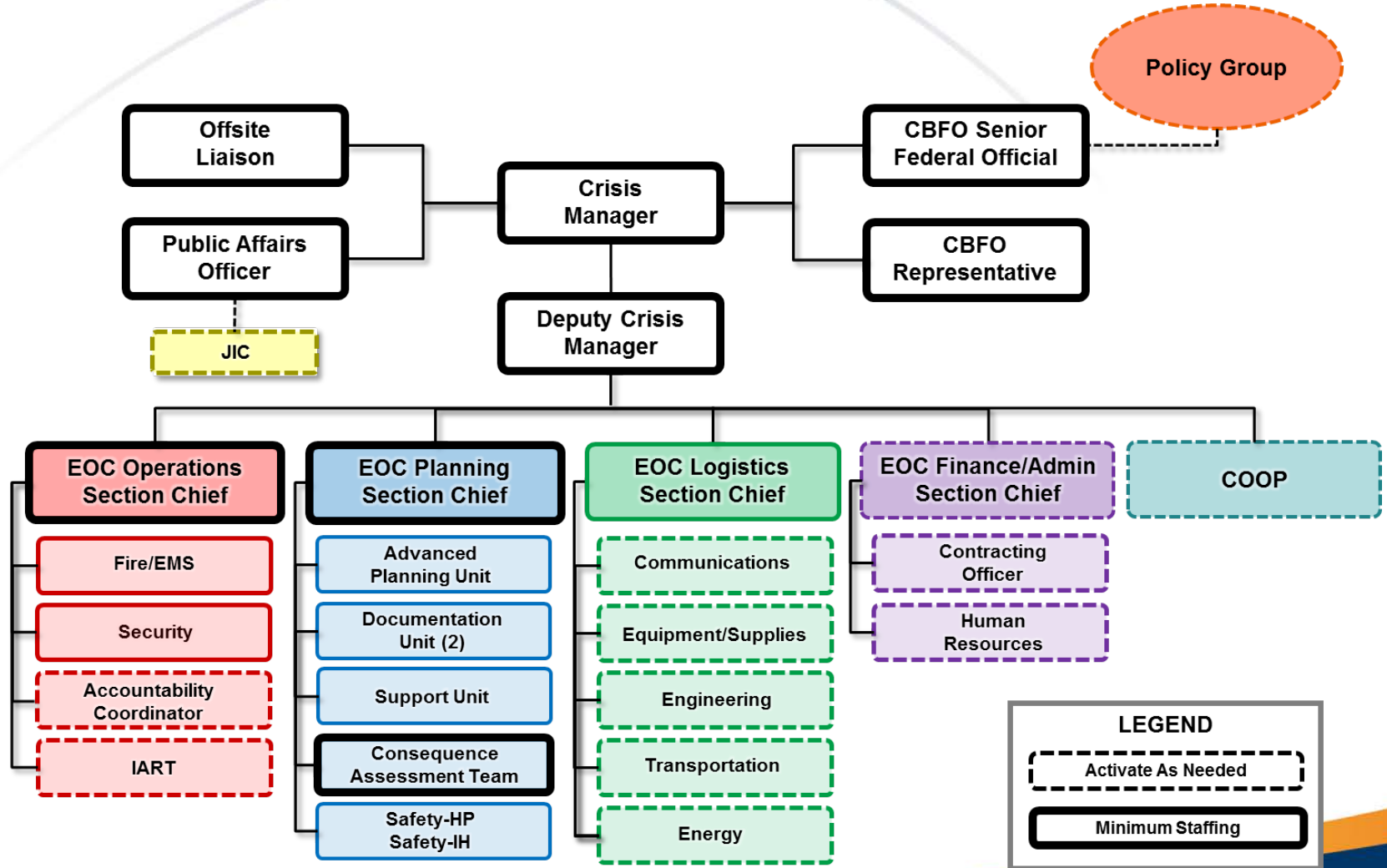
Goal 4 (continue) *(Major Milestone)*



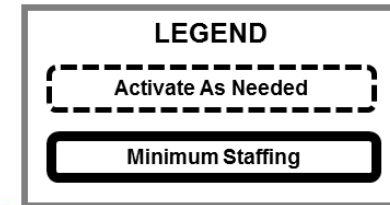
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EOC Structure – All Hazards



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Lessons Learned

- The recovery schedule and corrective action plans were very aggressive, but were feasible based on a phased approach.
- It is critical to have Senior Management support from the onset of recovery. If you don't have it, go get it!
- Having a roadmap, vision, and plan/schedule was vital to success.
- Subcontract support was vital in the surge in resources needed, but required significant management oversight for positive outcome.
- Collaboration with all stakeholders was critical; and garnering consensus was a must. Early work will pay dividends.
- Maintaining the existing emergency management programs while implementing program improvements and completing recovery activities was difficult, but important to ensure response capabilities.
- Transparency was critical to continue trust between WIPP and stakeholders (DOE/NNSA, and Local, State, Federal partners).
- External assessments during recovery process can be helpful if managed well, but can also create frustration and additional workload.

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Conclusion

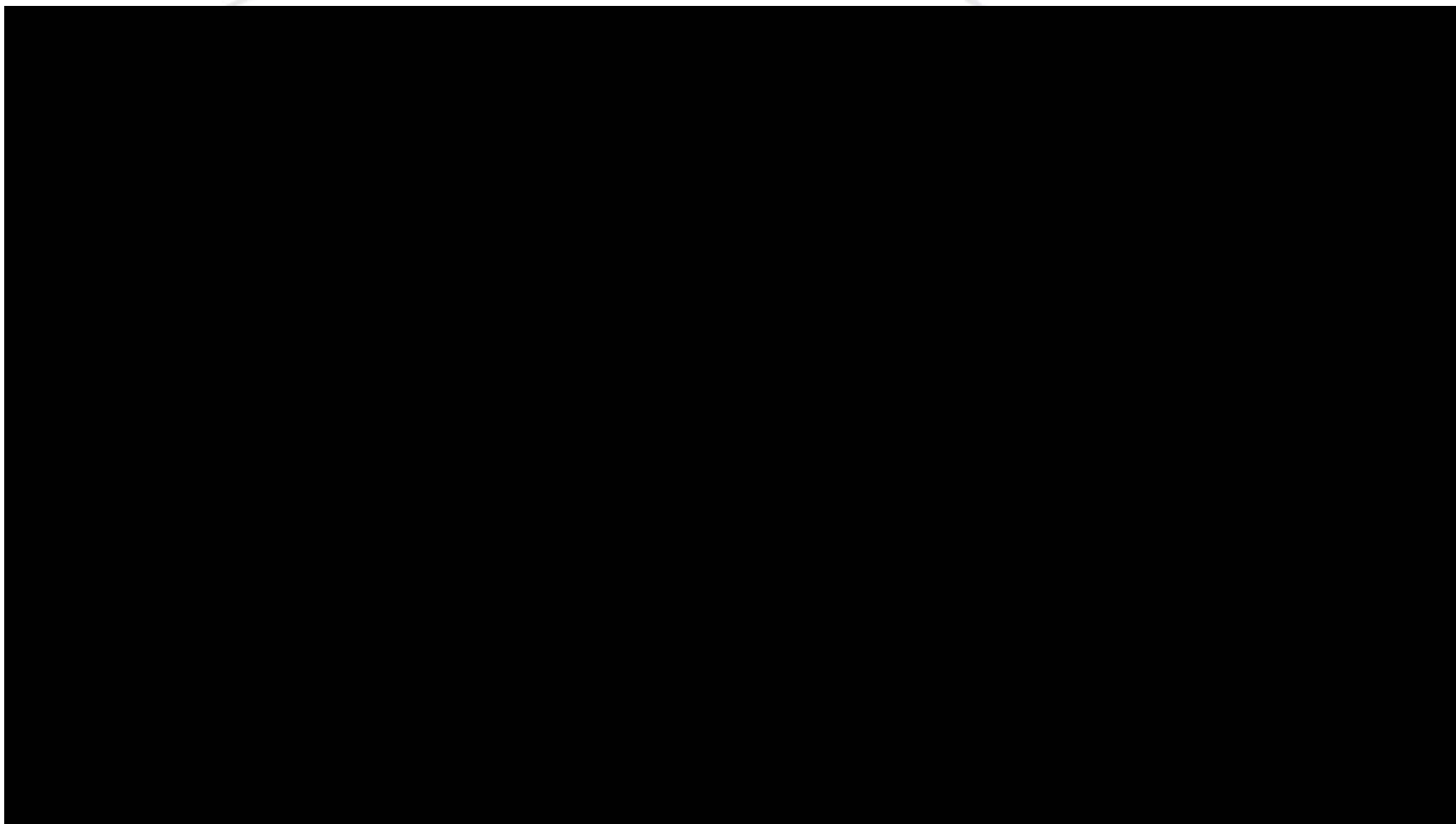
- A robust and compliant emergency management program is in place at WIPP, tested through internal and external assessments, and performance-based exercises.
- Capabilities and capacity to respond to all-hazards at WIPP is in place, but could be strained quickly during significant incidents.
- Continued strengthening of interfaces and collaboration with offsite partners (local, State, federal) will be important moving forward.
- Continued focus and support is needed for long-term sustainment – “Program of Excellence”

Never forget and always learn!



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WE ARE WIPP!



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Questions/Comments?



Thank You For Your Time!

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