



U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
**ENVIRONMENTAL  
MANAGEMENT**

# **WIPP Town Hall Meeting**

***Sponsored by the U.S. Department of Energy  
and the  
City of Carlsbad, NM***

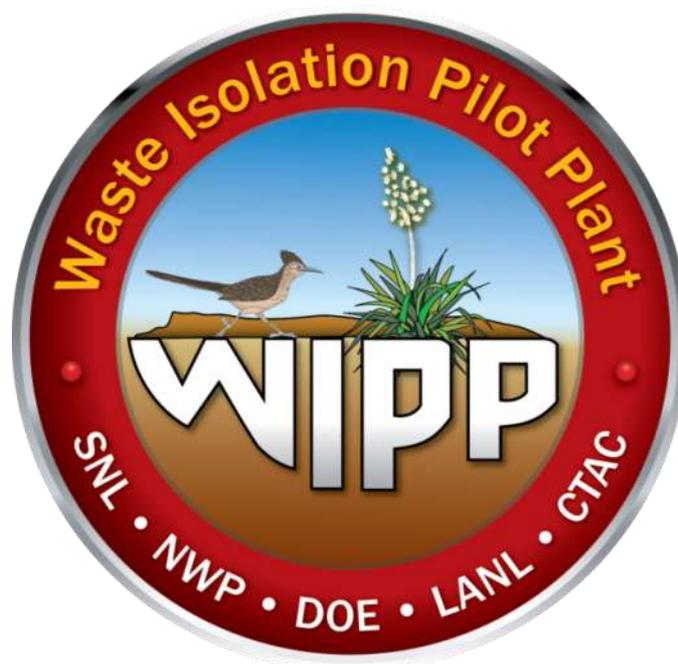
***June 2, 2016***

# Agenda

- Introductory Comments – John Heaton (Moderator)
- Update on CBFO and WIPP – Todd Shrader
- Documented Safety Analysis, Revision 5 – Jeff Carswell
- Preparations for Restart – Jim Blankenhorn
- Questions and Answers – John Heaton
  - In house
  - Internet

# Update on CBFO and WIPP Activities

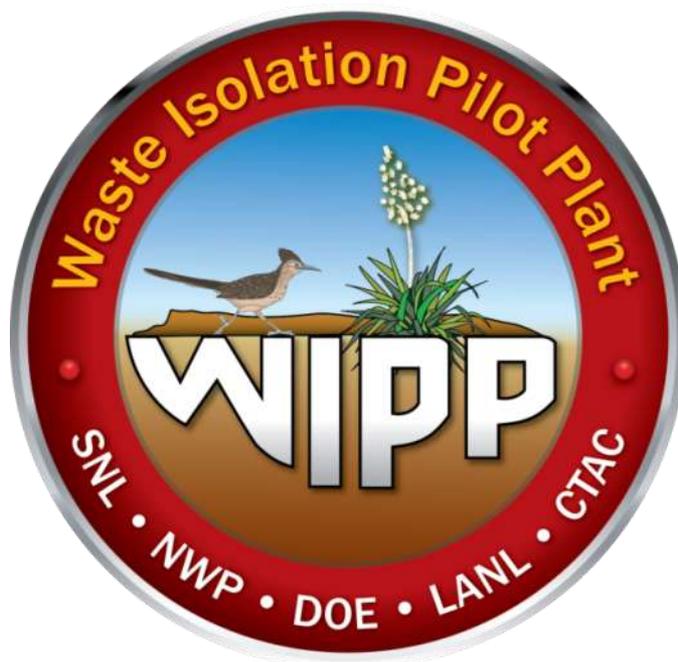
Todd Shrader, CBFO Manager



- Documented Safety Analysis (DSA)
- Cold Operations
- National TRU Program
- Annual Emergency Response Exercise

# Documented Safety Analysis, Rev. 5

Jeff Carswell, CBFO Nuclear Safety Sr. Technical Advisor



# Safety Basis Process

- Understand the Facility
  - Layout
  - Equipment
- What is the Process?
  - How does the Facility operate?
- What type of accidents can happen?
- How can the accidents hurt a Worker or the Public?
  - Hazards Analysis
- What equipment/controls will protect the Worker/Public?

# Understand the Facility

- A nuclear facility that is also a mine
  - Nuclear Safety
  - Mine Safety
  - Other regulations apply as well (e.g., OSHA)
- Some contamination – due to events of February 2014
- Diesel powered equipment – fuel source for fire
- Ventilation Systems already in place

# What is the Process?

- Review documentation from Generators
  - Ensure waste is correctly characterized and packaged
- Authorize Generator to ship waste
- Verify that the waste we receive is correct
- Remove waste from shipping containers
- Emplace waste in underground

# What kind of Accidents can happen?

- Fires involving waste containers
  - Pool fires from vehicle collision, damage, leaks
  - Combustible fires
  - Fires from within waste container
- Explosion/energetic events from within waste container
  - Deflagration, Over-pressurization from within waste container
  - Hydrogen explosion from battery charging
  - Flammable gas explosion from within a filled panel
- Loss of confinement/containment of waste container
  - Puncture/Crushing
  - Drop down waste shaft
  - Pressurized container impacting waste container

# What kind of Accidents can happen?

- Direct exposure to radiation from waste
- Externally initiated events
  - Wildfire
  - Plane crash
  - Vehicle crash
  - Gas pipeline explosion
- Natural Phenomenon Hazard (NPH)
  - Tornado/Hurricane
  - Lightning strike
  - Seismic event
  - Flooding
  - Snow Loading

# What kind of Accidents can happen?

- 641 Total events evaluated.
- Both man-made and natural
- Not all events require equipment/controls
  - **Low consequences** to all receptors (workers and public)
    - Radiation Exposure – **We have shielding**
  - Event is **not plausible** (not physically possible)
    - Large Propagating fire in the underground – **We are made of salt and will not burn**
  - Event frequency is **less than  $1 \times 10^{-6}$ /year**
    - Aircraft crash – **There are no large airports nearby**
    - Wildfire – **There is limited brush to burn**

# How can the Accidents hurt the Worker or Public?

- Extremely conservative estimates
- Potential radiation exposure
- Potential chemical exposure considered as well
- Potential industrial hazard or accidents



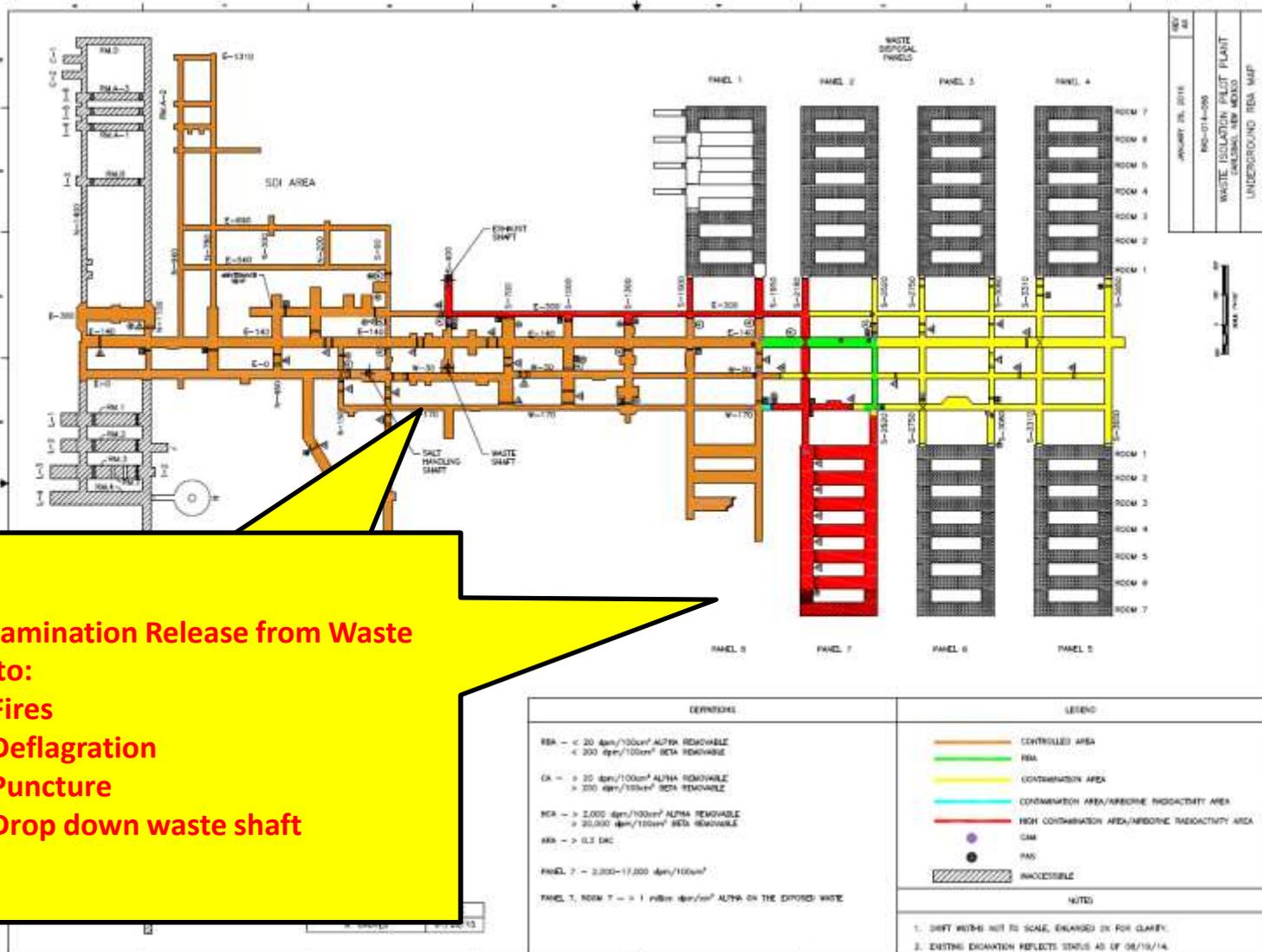
# Potential Accidents Above Ground

**Contamination Release  
from Ventilation System  
due to events in the  
Underground**

**Contamination Release from Building  
due to:**

- Fires
- Deflagration
- Puncture
- Vehicle Crash
- Seismic Event
- Lightning Strike

# Potential Accidents in the Underground



# What equipment or controls will protect the Worker and the Public

- Hierarchy of Controls
  - Preventers before Mitigators
    - Preventers keep an accident from happening
    - Mitigators make an accident less severe IF it does happen
- Passive Controls before Active Controls
  - #1 – Passive Controls – Design Features
  - #2 – Engineered Controls – Automatic Equipment
  - #3 – Administrative Controls
- Safety Management Programs
  - Key Elements (KE)

# What equipment or controls will protect the Worker and the Public



- #1 – Passive Controls – Design Features
  - Robust
  - Difficult to be removed/changed
  - No action required by the operator/facility
    - Building Structures
    - Radiation Shielding
    - Shipping Containers

# What equipment or controls will protect the Worker and the Public



- #2 – Engineered Controls
  - Less robust than Passive Controls
  - Electronic/Mechanical Equipment with Alarms/Interlocks
  - Needs to be regularly tested
  - Can fail – BUT we have actions to keep safe
    - Ventilation
    - Hoist Brakes
    - Fire Suppression

# What equipment or controls will protect the Worker and the Public



- #3 – Administrative Controls
  - Less robust than Engineered Controls
  - Action of the Operator
  - Steps in Procedures
  - Susceptible to Human Error – this is why we have a mix of control types.
    - Liquid Fueled Vehicle Checks/Controls
    - Conveyance Control
    - No TRU waste allowed outside (unless in a closed Type B)
    - Constant Air Monitors

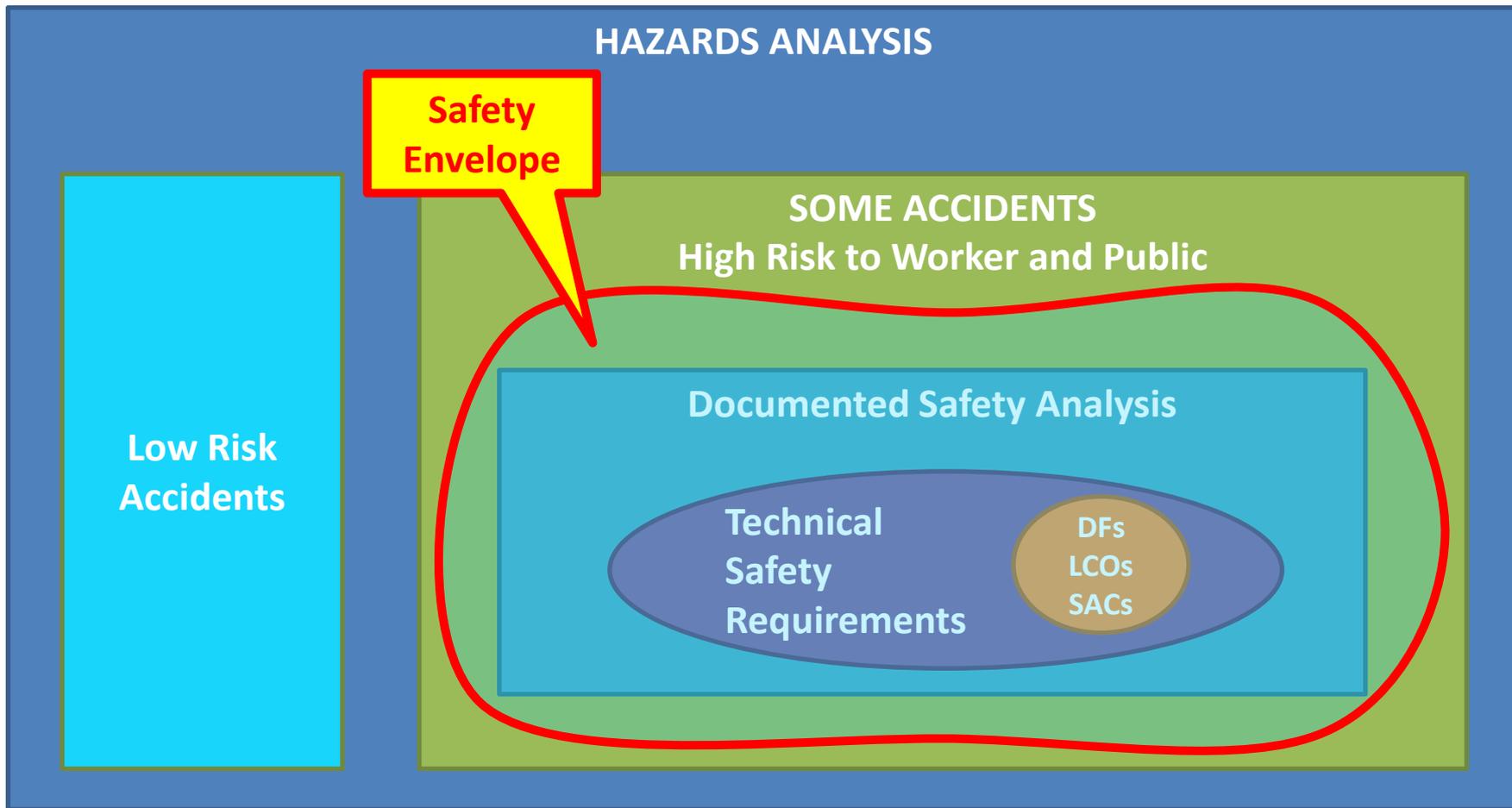
# What equipment or controls will protect the Worker and the Public

- Safety Management Programs
  - Lowest Level of Control
  - Broad but just as important
  - Larger programs
  - Key Elements (KE)
    - Waste Acceptance Criteria
    - RADCON
    - Emergency Planning
    - Non-Radiological Hazards (VOCs)
    - Quality Assurance
    - Procedures – Training

- Documented Safety Basis (DSA)
  - Chapter 2 (Facility Description)
  - Chapter 3 (Hazard/Accident Analysis)
  - Chapter 4 (Control Selection - Evaluation)
    - Design Features
    - Engineered Controls
    - Administrative Controls
  - Chapter 5 (Derivation of Technical Safety Requirements)
  - Chapter 6 (Criticality) – Not Applicable for WIPP
  - Chapters 7-18 (Safety Management Programs)

- Technical Safety Requirements (TSR)
  - ★ • Design Features (DF)
  - ★ • Engineered Controls
    - Limiting Conditions of Operation (LCO)
      - What additional safety things we do when equipment is inoperable
      - Surveillance Requirements (SR)
      - Tests we do to make sure the equipment is operating correctly
  - ★ • Specific Administrative Controls (SAC)
    - Detailed/critical administrative actions by Operators
  - Key Elements (KE) from Safety Management Programs

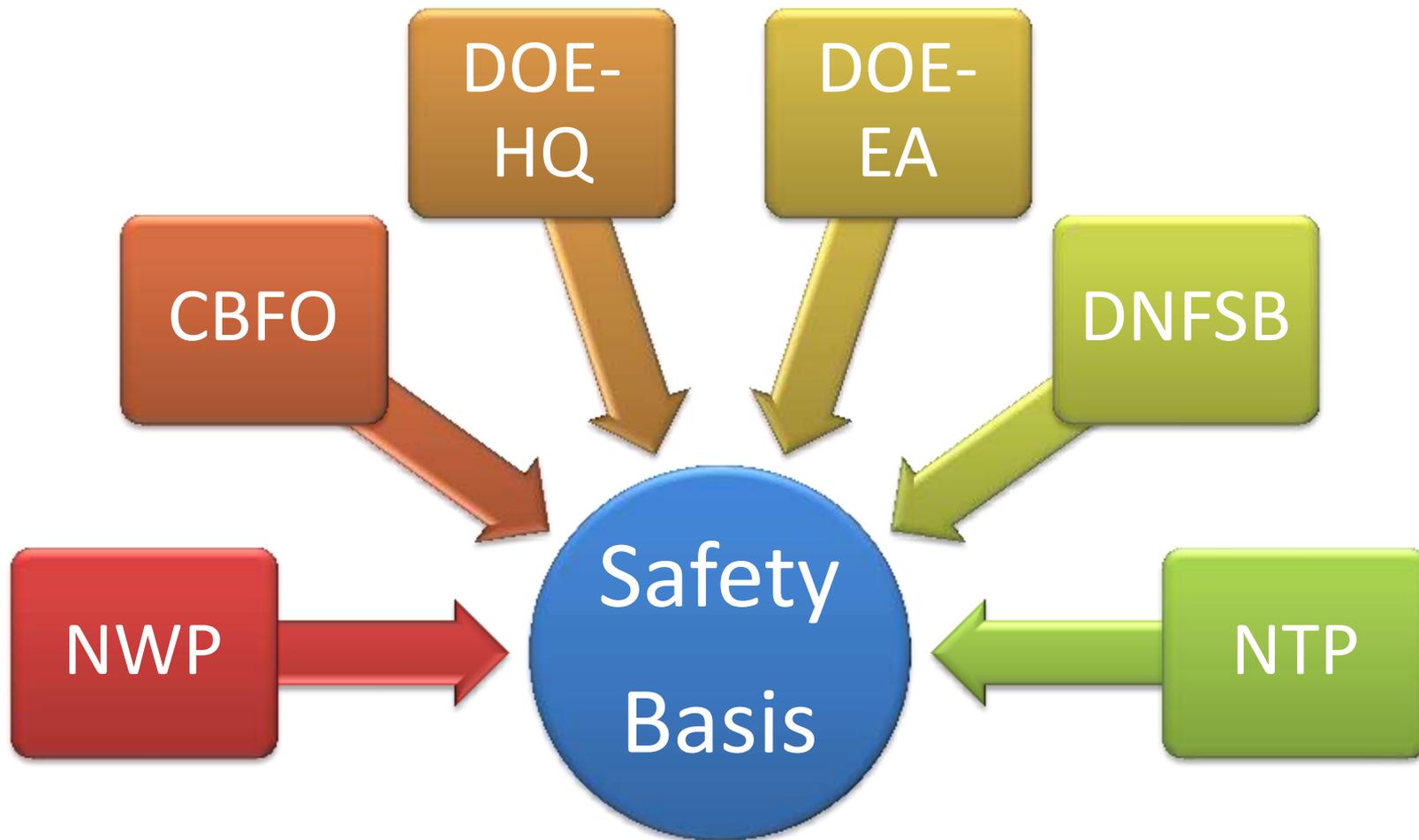
# Safety Envelope



# Safety Basis Process

- DSA Workshop
  - We will use recently upgraded DOE Standards for Safety Basis development
  - We will use an In-Process review method
- Create Safety Basis Review Team
  - Select members – Experts in the DOE Complex
  - Created formal review procedure
  - Reviewed all Accident Investigation Board Reports
- Weekly Telephone Conference
- Final approval via “first-in-complex” Safety Review Committee



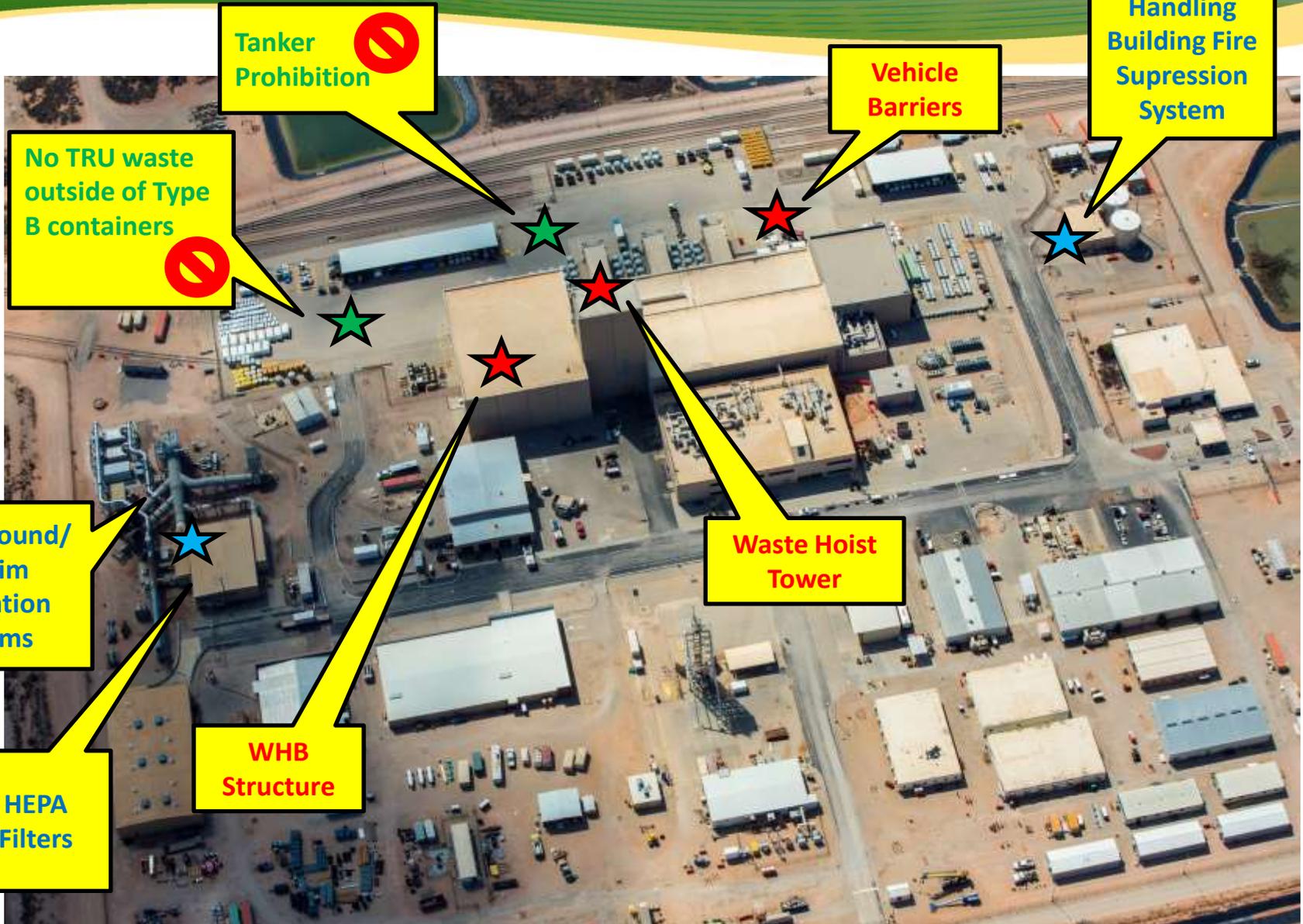


# Accident Investigation Board Issues

- Preventative/Corrective Maintenance Program
- Training and Qualification Program
- Emergency Response Program
- Radiation Protection Program
- Critical equipment and components degraded
- Fire Protection Program
- Failure of Generator Site to implement Waste Acceptance Criteria (WAC) requirements
- Ineffective Nuclear Safety Program in accordance with 10 CFR 830

# Site Layout

- ★ DF
- ★ LCO
- ★ SAC





# Waste Handling Building Fire Suppression System

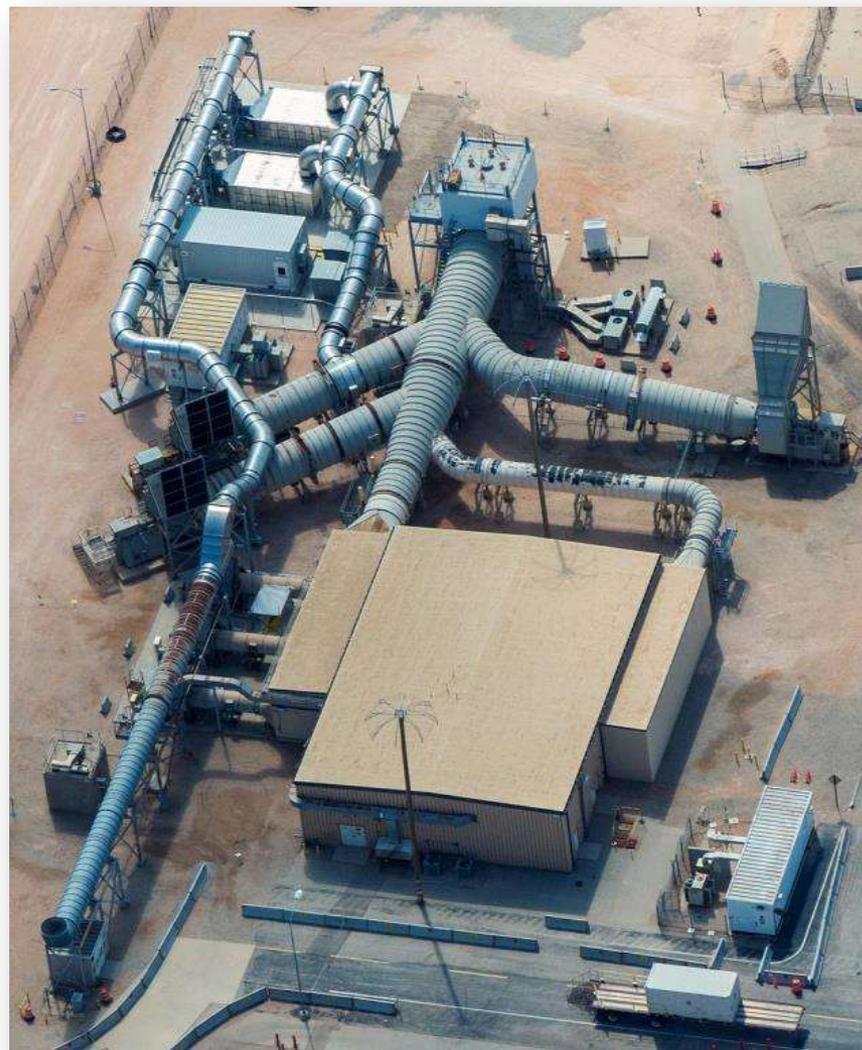


# ★ Vehicle Barricades

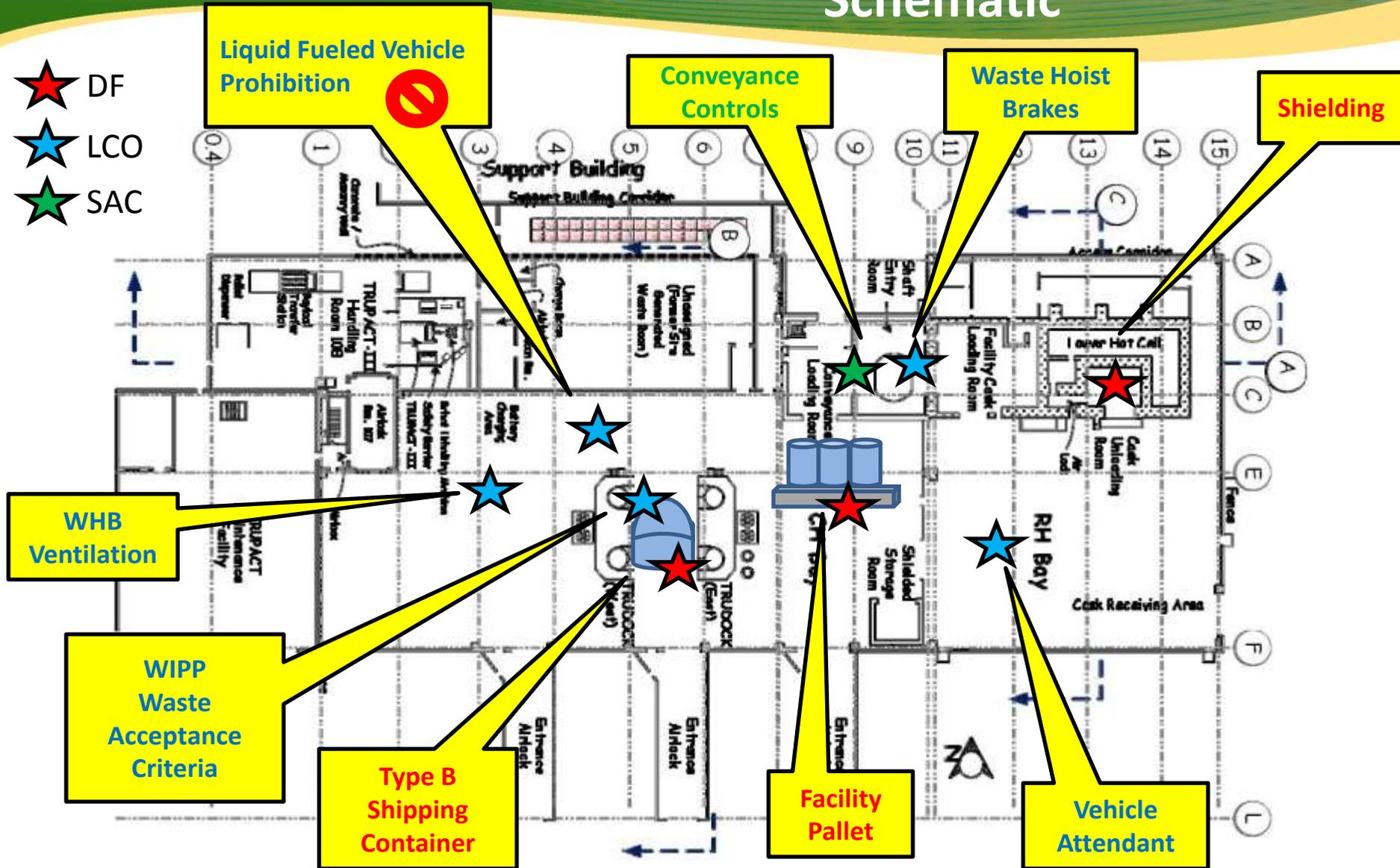


# ★ Interim Ventilation System

- Two new fan/filter units and ductwork
- Ties into prior Ventilation System



# Waste Handling Building Schematic



# ★ Facility Pallet



# ★ Type B Shipping Container



# ★ Conveyance Controls





# ★ Bulkhead Closure





# Vehicle Fire Suppression System – Attendants – Vehicle Checks

- Detect and suppress fire in vehicle
- Attendant for vehicles
  - Prevent collision, Respond to fire, Notify Control Room





# Vehicle Exclusion Zone— Lube Truck Prohibition



- No fuel truck present when waste present
- Limit of two liquid fueled vehicles near waste

# Accident Investigation Board Cause Cross Walk

AIB finding	Cause	Key Elements from DSA
Preventative and Corrective Maintenance Program did not prevent or correct the buildup of combustible fluids on the salt truck	Distinct difference between the way waste-handling and non-waste-handling vehicles were maintained	KE 11-1 - Maintenance and Inspection of non-waste vehicles in underground KE 11-5 Fire Safety Systems on diesel powered vehicles
Fire Protection Program less than adequate	Accumulation of combustible materials in the underground in quantities that exceeded the limits specified in the Fire Hazard Analysis (FHA)	KE 11-2 - Formal combustible control inspections by Fire Protection Engineering KE-11-5 - Automatic Fire Suppression in UG in some areas - Combustible material controls
Ineffective Radiation Protection Program in accordance with 10 CFR 835, Occupational Radiation Protection	Radiological control technician training, qualification, equipment and instrumentation	KE 7-1 - placement and operation of continuous air monitors KE 7-3 - contamination control, including upcasting KE-17-1 - configuration management of SSCs
Ineffective implementation of Comprehensive Emergency Management System	Personnel did not recognize, categorize or classify the emergency Personnel did not implement corrective actions	KE 15-1 predetermined corrective actions KE15-2 emergency plans and procedures KE 15-3 emergency operations center and incident command center KE 15-4 emergency drills and exercises command center
Failure of Generator Site to implement WAC requirements.	Procedures and process control	KE 18-1/2 waste stream approved KE-18-3 confirmation of certified waste KE 18-4 Independent generator site technical reviews

# Safety Basis Improvements

- Completely revised Hazards Analysis
- Significant upgrades to Safety System Evaluations
- Waste Acceptance Criteria Safety Management Program (SMP) – first in complex
- More robust SMP Key Elements incorporated into TSR
- Mining safety requirements incorporated into DSA
- In-Process review concept with DOE complex experts
- Transparent to outside reviewers (DNFSB, DOE-EA)
- WIPP Operator/Engineer input

# Safety Basis Improvements

- Living Document.
- Continues to be Improved.
  
- Fire like February 2014 WILL not happen again.
- Radiological release like February 2014 WILL not happen again.
- ★ • New/upgraded Design Features
- ★ • New/Upgraded equipment
- ★ • New administrative requirements
  - New Safety Management Programs – Key Elements

# Preparations for Restart

Jim Blankenhorn, NWP Recovery Manager



*An AECOM-led partnership with BWXT and AREVA*

# DSA Implementation

- DSA implementation declared on May 29. As of today:
  - All Independent Verification Review issues are closed
  - Necessary signs/postings required for implementation are in place
  - Procedures have been reviewed, approved
  - Scheduling of required surveillances and inspections is in place to support implementation

**WHAT A SUCCESS!**

IN LESS THAN ONE MONTH WE HAVE ACHIEVED FULL  
**DSA IMPLEMENTATION**

The WIPP team celebratory of the Central Air Facility Rev. 5.0 DSA was implemented at midnight May 29.

- Because of your tremendous effort over the last 3 months, including the effort by so many over the Memorial Day weekend, we have fully implemented Documented Safety Analyst (DSA) Rev. 5.0!
- This is the first DSA fully compliant with DOE Standard 3509-2014 in the nation.
- It typically takes up to six months from DSA approval to full implementation, and we completed this task less than 1 month after approval of the DSA.
- It's a remarkable accomplishment and every team member should be proud that they did their part to make it happen.

**WE ARE MOVING FORWARD TOWARDS COLD OPERATIONS!**

**WIPP**  
WINDY HILLS PLANT  
MAY 2002 - MAY 2014

This Accomplishment Exemplifies Our Core Values & Expectations:  
INTEGRITY - MODEL HIGH STANDARDS and DO WHAT YOU SAY YOU ARE GOING TO DO.  
TEAMWORK - HELP EACH OTHER ACHIEVE WIPP GOALS

# Interim Ventilation System

- Interim Ventilation System will:
  - Provide adequate air flow at the waste face – for resumption of waste placement
  - Increase airflow for ground control and maintenance operations
- CRA Field Observations Complete 5-24
  - Closeout 5-26
- Issues Identified
  - Postings Not In Place
    - Rad, Noise protection, confined spaces
  - RWP not approved for use
  - Pre-fire plan walk downs
    - Required every 30 days during construction were not evident





- Path to Success
  - Close out CRA Findings
    - The majority are being closed as they are identified
  - Install Fire Detection System– mid June
  - Pull the 700 blank
    - Perform hot testing and mine balancing
  - Turn over to Operations early during Cold Operations
  - Perform Lessons Learned on Contractor Readiness Assessment

## Demonstrate the Plant, People and Processes are ready:

### Plant

- Equipment necessary for receipt, processing and downloading of waste is available and properly functioning
- Underground Notification System, Localized Fire Suppression Systems in underground

### People

- Demonstrate Nuclear Safety Culture and Conduct of Operations Standards
- Proficiency with new DSA controls (surveillances, operator rounds)
- Waste emplacement activities utilizing empty containers
- Maintenance evolutions

### Process

- Safety Management Program pre-start improvements are demonstrated
  - Examples: Fire Protection, Radiological Controls, Emergency Management
- Conduct drills (Radiological event, injury, fire)

# Questions & Answers

