

SAVANNAH RIVER SITE

Response to Graniteville, SC
Train Derailment
January 6, 2005

Presented By Richard Davis



Savannah River



Fire Department

What Lies Ahead



Savannah River



Fire Department

January 6, 2005

- Initial 911 Call 2:39 am
- First fire department call dispatched 2:40 am
- Law enforcement dispatched
- EMS dispatched



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Confirmed Derailment

- Head on collision between a traveling 42 car train and an 11 car stationary train
- Discussion on implementation of Reverse 911 (Community Alert Notification System)
- Shelter-In-Place vs Evacuation



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Incident Information

- North bound Norfolk Southern Rail Road Train *192P005*
- 25 loaded cars - 17 empties
- Operating at a recorded speed of 41 mph
- Derailed at milepost 178.2 on the R line, Piedmont Division Graniteville, South Carolina.

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Hazardous Materials

Materials on Consist

- 5 total containing hazardous material
 - 3 cars of Chlorine
 - 1 car of Sodium Hydroxide
 - 1 car with a residue of elevated temperature liquid, NOS (rosin)



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Hazardous Materials

- 4 of the 5 derailed tank cars owned by Olin Chlor Alkali Products of Augusta , Ga
 - 3 cars containing 180,000 lbs of chlorine each
 - 1 car containing 191,000 lbs 50% solution of Sodium hydroxide in water
- Westvaco Corp, De Ridder, LA shipped the 5th derailed tank car containing a residue of an elevated temperature liquid, NOS (rosin)

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Hazardous Materials

Chemicals Released

- 1 car containing Chlorine, 180,000 lbs ,(90 tons). Approximately 160,000 lbs (80 tons) released (DOT 105-500).
- 1 car containing a residue of elevated temperature liquid, NOS (rosin) (residue only, possibly 200-300 gallons remained)

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Derailment Location Rescue

- Entry team (**SRS FD personnel**) finds and rescues one person trapped in a car under a tree at derailment location.
- Rescued individual was **unharmred!**



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Fire Department



**Avondale Plant
Property**

Hickman Street

Stationary Engine

Traveling Engine

Main Street

Kaolin

Chlorine &
Sodium Hydroxide

Switch

Residence less than 150'

Date: 01/06/05 Wind Speed: 7.1 MPH Mixed-Layer Depth: 1640 FT Source: SAM
 Time: 09:00 EST Wind Direction: 206 Plume Direction: 26 Stability Class: D

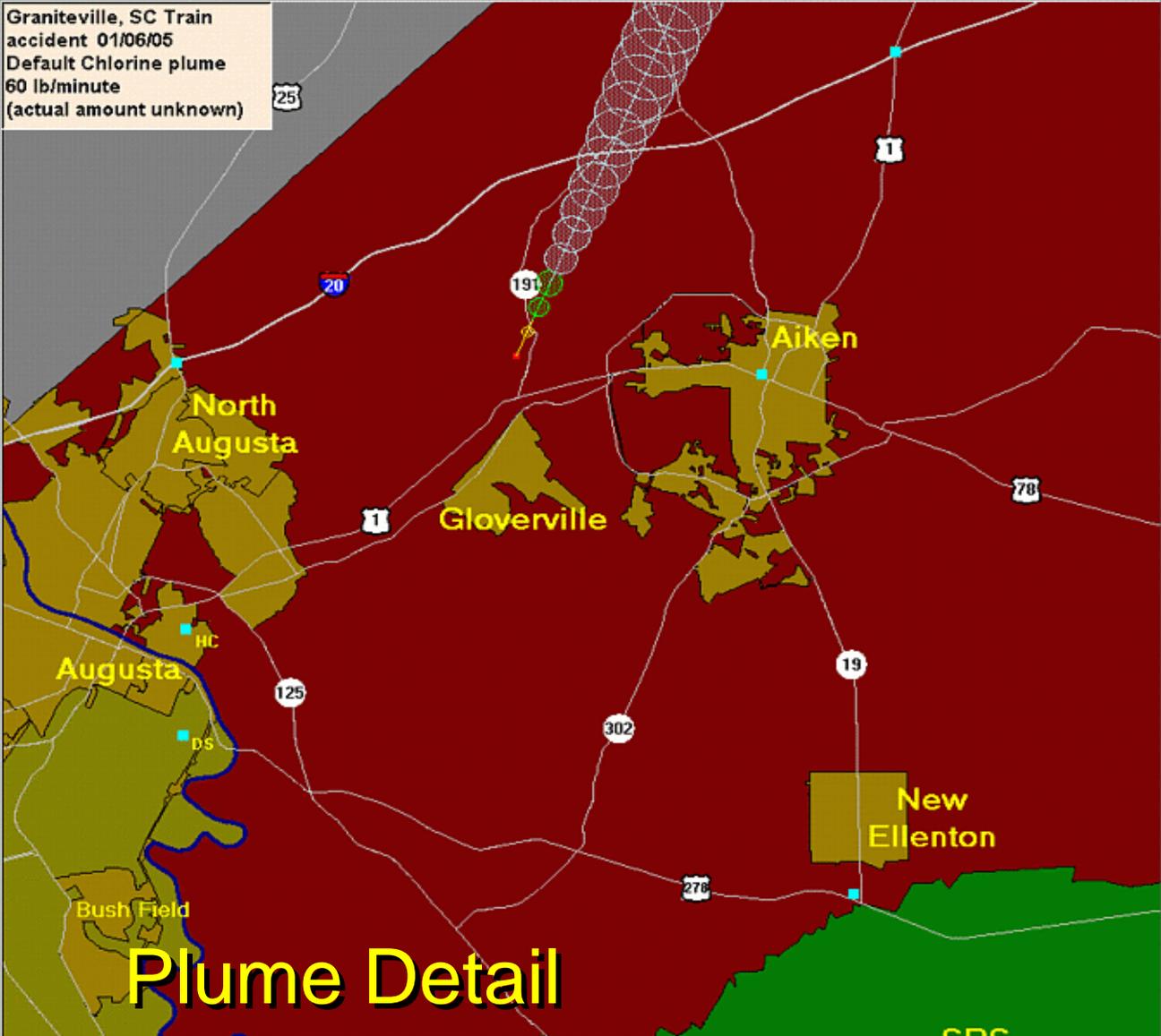
MODEL RELEASE SYNOPSIS

Release Site: UNKNOWN
 Release Time: 08:00 EST 06-Jan-05
 Release Height: 5 FEET
 Model Time: 09:00 EST 06-Jan-05
 Model End Time: 09:00 EST 06-Jan-05
 Total Release: 1.00E+04 LBS

Legend

CHLORINE			
Arrival Time (hh:mm)	Distance (miles)	Conc (ppm)	
08:15 EST	2.4	8.2E-01	
08:19 EST	3.0	6.2E-01	
08:24 EST	3.5	5.0E-01	
08:28 EST	4.1	4.2E-01	
08:31 EST	4.7	3.6E-01	
08:36 EST	5.3	3.2E-01	
08:40 EST	5.9	2.8E-01	
08:43 EST	6.5	2.6E-01	
08:47 EST	7.1	2.4E-01	
08:52 EST	7.7	2.2E-01	
08:56 EST	8.3	2.1E-01	
09:00 EST	8.9	2.0E-01	

Graniteville, SC Train accident 01/06/05
 Default Chlorine plume
 60 lb/minute
 (actual amount unknown)



XY - PLOTS

Maximum Concentration Us. Downwind Distance

Plume Height Us. Downwind Distance

Duration Exposure Us. Downwind Distance

Plume Detail

Savannah River National Laboratory

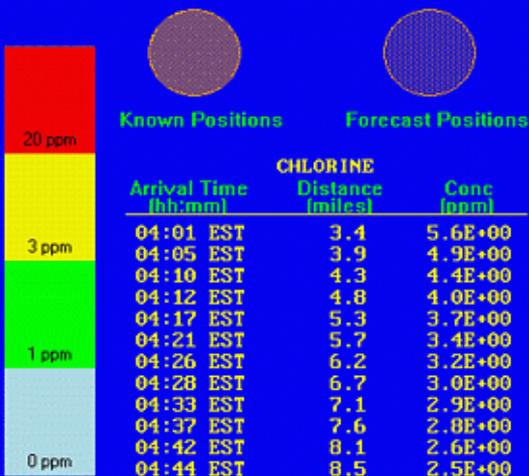
INTERACTIVE MODE

Date: 01/06/05 Wind Speed: 7.0 MPH Mixed-Layer Depth: 1640 FT Source: MA
 Time: 03:50 EST Wind Direction: 205 Plume Direction: 25 Stability Class: E

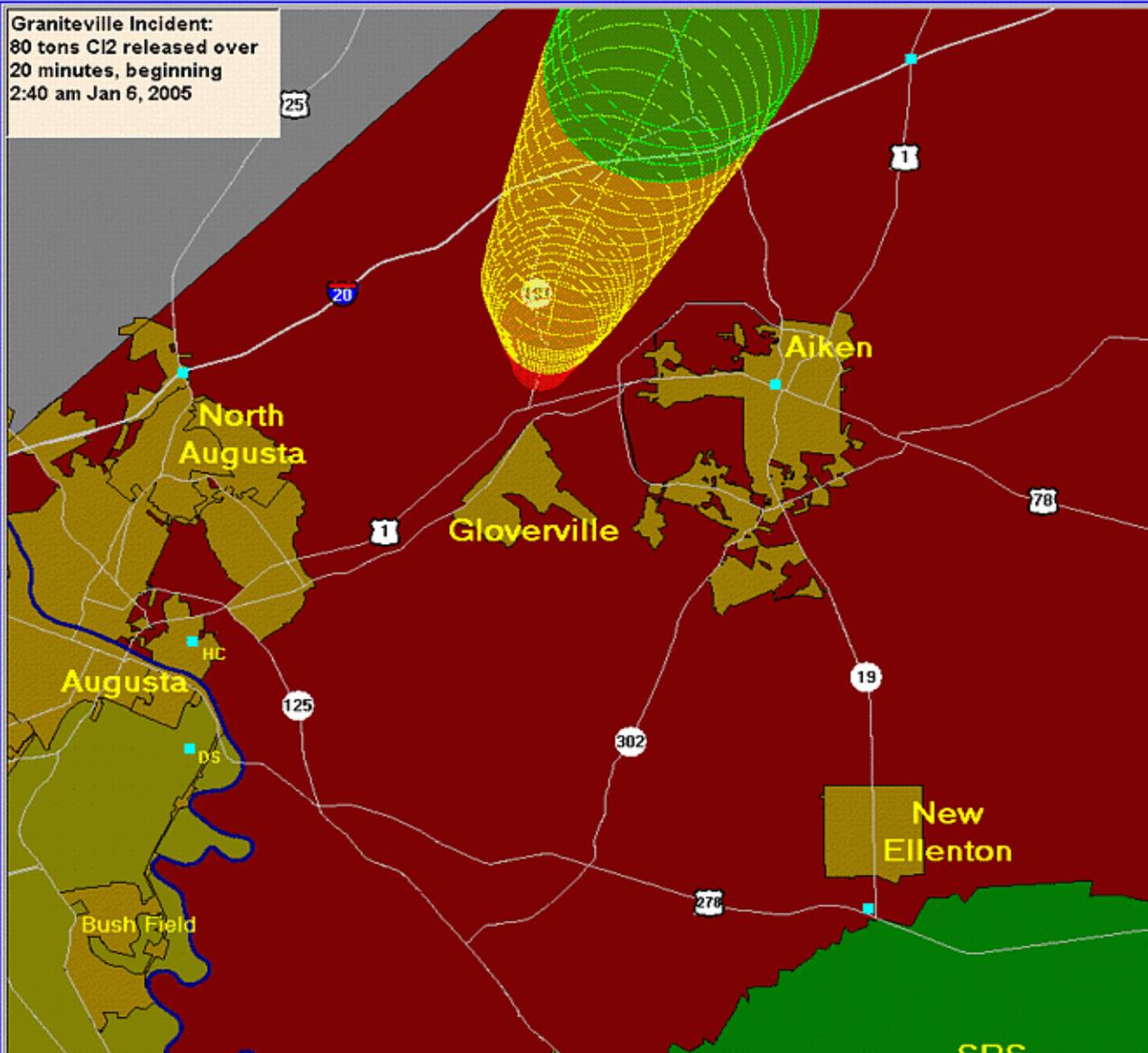
MODEL RELEASE SYNOPSIS

Release Site: UNKNOWN
 Release Time: 02:50 EST 06-Jan-05
 Release Height: 20 FEET
 Model Time: 04:47 EST 06-Jan-05
 Model End Time: 04:47 EST 06-Jan-05
 Total Release: 1.60E+05 LBS

Legend



Graniteville Incident:
 80 tons Cl₂ released over
 20 minutes, beginning
 2:40 am Jan 6, 2005



SAVANNAH RIVER
 NATIONAL
 LABORATORY
 Atmospheric
 Technologies
 Group

XY - PLOTS

Maximum Concentration Vs. Downwind Distance
 Plume Height Vs. Downwind Distance
 Duration Exposure Vs. Downwind Distance

SELECT
 BACKGROUND
 MAP

START MONITOR DISPLAY

STOP MONITOR DISPLAY

TReset

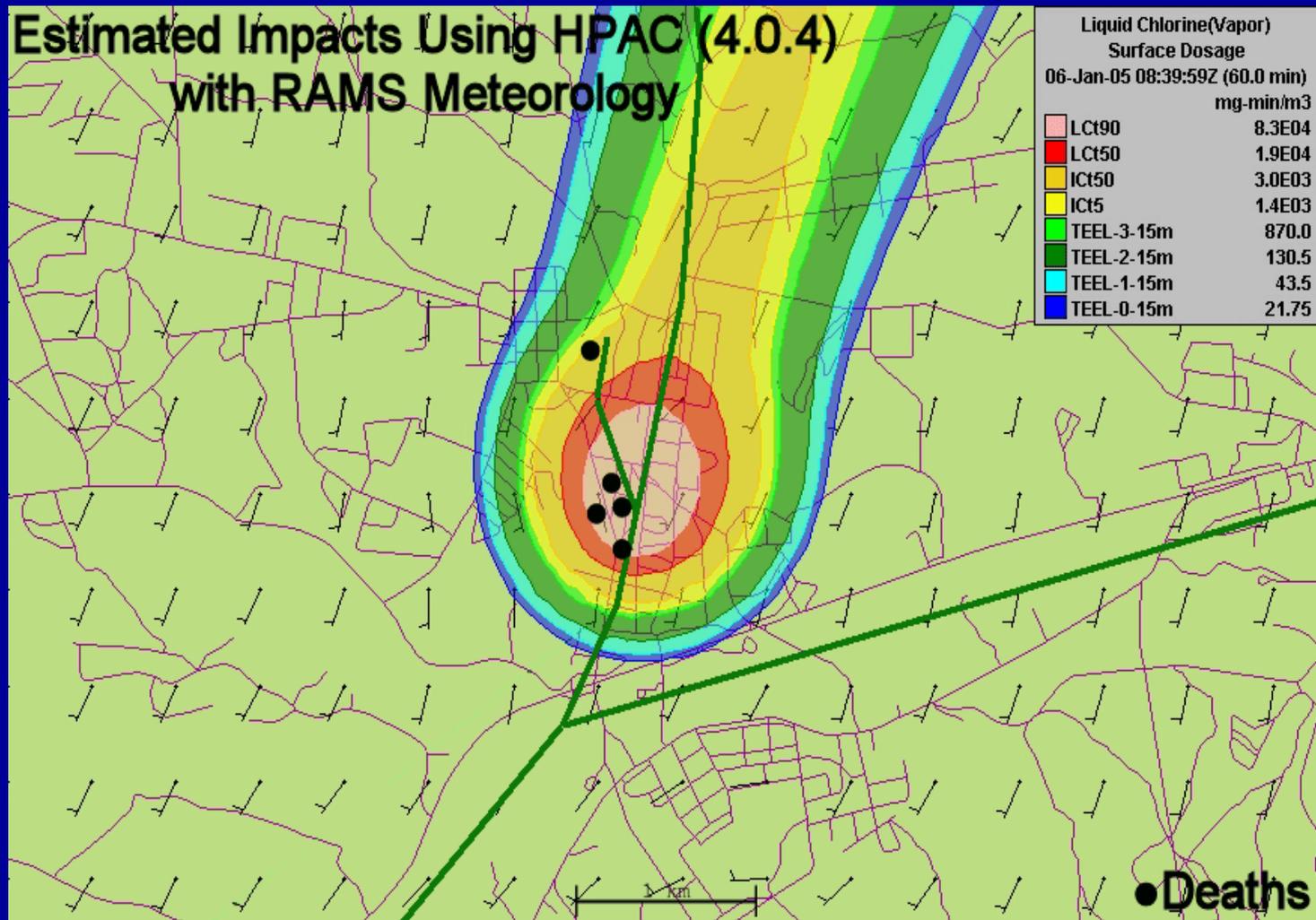
Home

PROCESS OUTPUT PAG

SAVE IMAGE

QUIT

Estimated Impacts Using HPAC (4.0.4) with RAMS Meteorology



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Fire Department

Interagency Cooperation

- 111 agencies participated in the response
- Operated under a Unified Command Structure
 - Fire
 - Hazardous Material
 - EMS
 - Law Enforcement
 - County Agencies
 - State Agencies
 - Federal Agencies



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Sustained Operation

- 10 days of response operations 24/7
 - Security perimeter established by LE
 - Size up and off loading operations for 8 days
 - EPA, Coast Guard, State Health Department and hazardous Materials Teams made numerous hot zone entries daily



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Injured and Fatalities

- Plant workers overcome by chlorine, request for assistance, were told to leave work
- One fatality in a residence
- One train crew member received fatal injury
- Six plant workers died in three different locations
- One subcontractor died while making delivery



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SRS FD Assistance

- First hazardous materials team on scene (Assigned as Haz-Mat Branch Director Thursday-Sunday)
- Confined space entry and technical search equipment
- Command post for GVW Fire Department



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Additional DOE-SRS Assets

- Dispersion modeling
- Law Enforcement personnel and helicopter
- Crisis counseling
- Support of employees that volunteer with local agencies

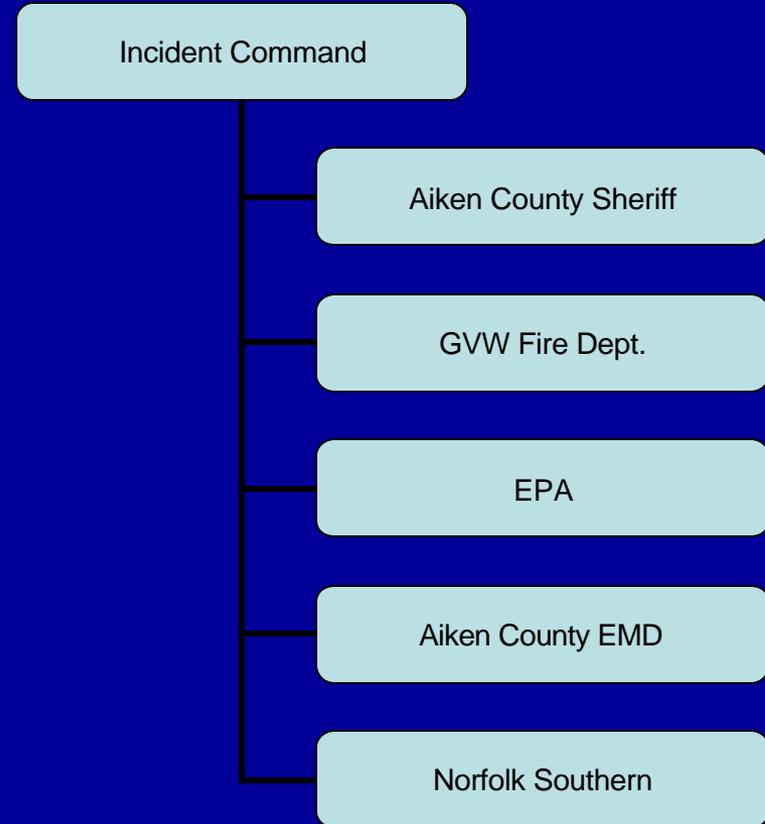
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Command Structure

- Managed under a unified command structure
- State of emergency declared at approximately 12:00 pm on January 6 by Governor Mark Sanford to expedite resource acquisition
- NIMS training and integration



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Lessons Learned

- Interoperability continues to be a primary concern
- Utilization of NIMS
- Understanding of Federal, State and local resources



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Fire Department

Initial Strategic Goals

- Establish isolation and protection in place measures
- Implement multiple large volume decontamination areas
- Perform reconnaissance of derailment site to determine product releases and mitigation options
- Begin accountability cross checks for Avondale Mills employees
- Implement perimeter in-place monitoring activities
- Fully implement Unified Command

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Compounding Events

- Steam Plant Fire



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Lessons Learned

- Use of standard ICS forms is essential when integrating with Federal assets
- A means of standardized accountability needs to be implemented for large scale incidents



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Lessons Learned

- DHS Pre-positioned Equipment Program
- SC Firefighter Mobilization Program
- Development of CSRA Hazardous Materials Working Group
- Greater Emphasis on Joint Training

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Success Depends On.....

- Early integration of resources
- Full implementation of Incident Management Systems
- Establishing a sound communications plan including adequate channels and interoperability for all agencies
- Understanding of the National Response Plan and state emergency response plans

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Concluding Information

Location: Graniteville, South Carolina

Date and Time: January 6, 2005 2:39 am

Injuries:

- 9 Fatalities
- 552 Injuries treated
- 69 Patients admitted to local hospitals

Evacuated: 5,400+ residents

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Questions



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Thank You!

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