



EM Program Update

**Presented to the Midwest Council
of State Governments
June 27, 2007**



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Office of Transportation, EM-63**



EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

www.em.doe.gov

Solving Cleanup Challenges Through Risk Reduction

❖ **EM is the largest cleanup project in the world:**

- ❖ 114 sites
- ❖ 31 states
- ❖ 2,000,000 acres

❖ **Completed 3 sites in FY 2006**

- ❖ Rocky Flats
- ❖ Kansas City Plant
- ❖ LLNL (Main Site)



Planned FY 2007-2008 Cleanup Completions

FY 2007

- Ashtabula Environmental Management Project
- Columbus Environmental Management Project
- Fernald Environmental Management Project
- Lawrence Berkley National Laboratory

FY 2008

- Miamisburg Environmental Management Project (OU-1)
- Inhalation Toxicology Laboratory
- Pantex Plant
- Lawrence Livermore National Laboratory (Site 300)

EM Shipping Continues. . .

- Prospective Shipment Report issued in February 2007
 - The report is provided for planning purposes only
 - Follows *DOE Manual 460.2-1* guidance
 - Projected shipping schedules may change as a result of funding restrictions (impact from continuing resolution funding)
 - Exploring options for providing shipment planning information
- LLW & MLLW shipments continue from WVDP, OR, and Mound
- MOX shipments from Hanford to ID
- Sodium Bonded SNF shipments planned from Hanford to ID in Fall 2007

Mound/Miamisburg Shipments

- Shipment of Operable Unit-1 LLW (75,000 tons) :
 - Approved disposal facility profiles were in place prior to any shipments leaving Mound.
 - Absorbent is added to ensure there are no free liquids being transported.
 - The material is primarily soil and debris.
 - Shipments to *EnergySolutions* are by rail
 - Individual rail cars in ‘general consist’
 - Each gondola car is equipped with a lid
 - Expect ~560 railcars of waste
 - As of May 2007 – 126 railcars have been shipped

West Valley LLW Shipments

- WVDP to NTS – 140
 - Rail shipments began in March 2007.
 - Uses lift liners with drums inside. Lift liners go by rail to Henderson, CO then trucked to NTS – completed 38.
 - Also have completed 43 highway shipments to NTS
- WVDP to EnergySolutions – 160
 - Primarily uses intermodal shipments to Alaron, PA then consolidated to gondola cars for rail shipments to EnergySolutions, UT (29 highway shipments to Alaron=5 railcars completed)
 - Also uses truck shipments directly to EnergySolutions, UT (12 highway shipments completed)

FFTF Closure Project. . .

- Completed shipment of irradiated steel duct in March 2007
 - Hanford to LANL
- T-3 shipping cask used



FFTF Closure Project. . .

MOX Shipments

- Two shipments of mixed oxide fuel from Hanford to the INL planned in 2007
 - One of irradiated fuel & one unirradiated fuel
- Transportation Plan Completed
- Will use the T-3 Shipping Cask
- First shipment completed in May
- Final shipment will be in the Fall 2007

FFTF Closure Project. . .

Sodium Bonded Fuel Shipments

- Nine shipments from Hanford to INL
 - Shipments planned to begin in Fall 2007
 - Transportation plan in review by states and tribes along corridor
 - Requires an MOU between EM & NE
- Modifications will be made to the T-3 cask
 - Submitted to EM-60 for approval
 - Revised Certificate of Compliance is on schedule for planned Fall 2007 shipments



DUF₆ Conversion Project Overview

- Physical construction of the two conversion facilities is on track for completion in Fall 2007.
- Operations are expected to begin by June 2008
- First waste shipment anticipated in August 2008.
- Primary disposal site is NTS
 - Have not yet identified the transload facility
 - Secondary disposal site is EnergySolutions
- Fact sheet has been completed
- Transportation plan undergoing internal review
 - Ready for State review in early Fall 2007

Uranium Oxide Transportation Logistics

- Each uranium oxide cylinder will weigh ~14-18 tons.
- 11 railcars are planned to be shipped each week.
 - Group of 5 or 6 railcars will be shipped from each site
 - Each gondola railcar will contain up to 6 cylinders



SNF Transfer Project

- DOE is planning to begin shipping SNF between the Savannah River Site (SRS) and the Idaho National Laboratory (INL) in 2009
- On August 17, 2006, DOE approved the Enriched Uranium Disposition Project at SRS. This decision specified positioning the aluminum-clad SNF inventory at SRS at the SRS H-Area facilities.
- Approximately 20 shipments per year for 10 years are being planned
- More information will be provided during the breakout session at TEC/WG in July 2007.

Fernald Silo Waste at WCS

- In December 2006, WCS received an extension to the Texas storage license for the silo waste from October 31, 2007, to October 31, 2009
- WCS submitted application for disposal permit
 - Approval of draft license is expected in Summer 2007
 - Open for public comment
 - Final license could be issued in October 2008
 - Would allow for the disposal of the Fernald 11.e.2 material at WCS

EM Shipments Continue to Decrease

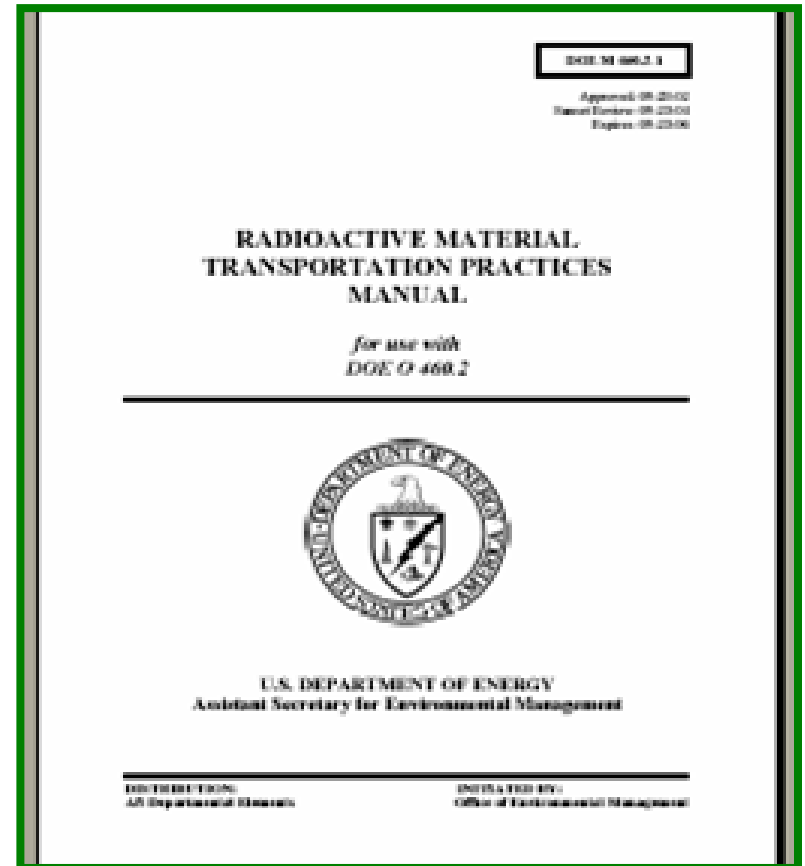
- As sites are closed or D&D work completed, shipment numbers are decreasing

<u>FY06 Shipments</u>	
• TRU	1,150
• NM	20
• MLLW	720
• LLW	11,770
• DUF ₆	400
Total	14,060

<u>FY07 Shipments</u> <u>(~2Q)</u>	
• TRU	532
• MLLW	226
• LLW	1,495
• DUF ₆	127
• Other	15
Total	2,395

Update of DOE Manual 460.2-1

- Formal review ended April 2007
- Comment resolution is complete
- Manual is in formal concurrence process
 - All program offices
 - Nonconcurrence from GC
 - Working to address issues
- Issuance date depends on resolution of GC concerns and program concurrences



Performance Metrics

➤ Calculation of Incidents Rates/Million Miles:

FY06 Incident Rates

- $22 / 14,060 = 15.65 / 10,000$ shipments
- $22 / 13,300,000 = 2.03 / 1,000,000$ miles



Current EM Event Reporting Criteria

- Any release of an EM material during transportation;
- Any injury (either outpatient, first aid, minor injury, hospitalization, or fatality);
- Any damage to the transport vehicle, package, or property;
- Any fines; regulatory violations; or deviations from accepted protocols, orders, or procedures;
- Any package damage or load securement problem;
- Any route deviation (for Transcom monitored shipments); security breach; or activation of emergency personnel;
- Any deviation that triggers a Level VI CVSA inspection;
- Any road closure or public evacuation;
- Any local or national media coverage.

So How Are We Doing?

FY 2004 Transportation Incidents:

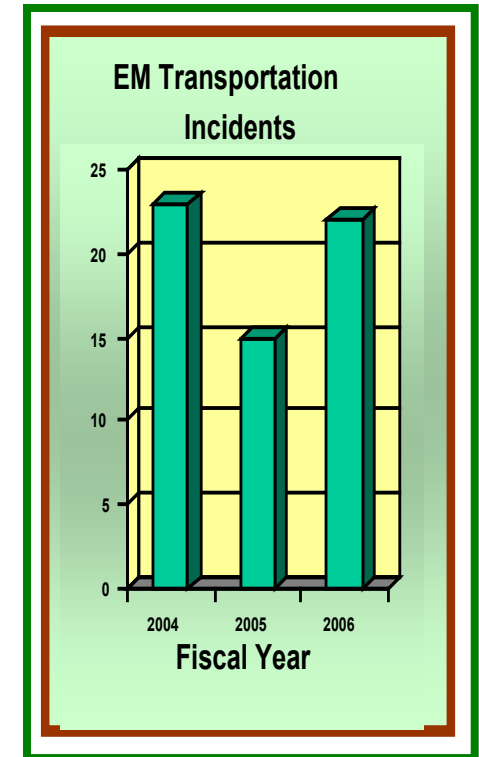
- EM had 23 reported off-site incidents.
- Incident Rate = $23/2.0 = 11.5$ Incidents/10,000 Shipments

FY 2005 Transportation Incidents:

- EM had 15 reported off-site incidents.
 - Most significant incident was rain water in BNL railcar
- Incident Rate = $15/2.2 = 6.8$ Incidents/10,000 Shipments

FY2006 Transportation Incidents:

- EM had 27 transportation events (22 incidents).
- Incident Rate = $22/1.4 = 15.7$ Incidents/10,000 Shipments



Revised Event Reporting Criteria

- Working group established in January 2007
 - Representatives from WGA, NE-CSG & MW-CSG; field sites (CBFO, SR, & EM-CBC); and EM-63
- Reviewing “official” reporting requirements (DOT, NRC, EPA)
- Will define event, incident, accident, etc.
- Determine how to categorize
 - Everything would not carry the same weight (e.g., deer strikes versus collision)
- Goal is to have a product that allows the field to know what should be reported and provides appropriate information to the states

EM Transportation Events in FY 2007

- 11/06, ID – Inaccurate Characterization of Hazardous Waste Shipment
- 11/09, WVDP – Mechanical Failure (blown engine)
- 11/16, SR – Two shipments did not follow preferred routes to NTS
- 3/05, PORTS – Driver reports concerns regarding a Rad-Waste Shipment (leaking Sealand container)
- 3/10, ID/WIPP – Helium Leak Test conducted on TRUPACT Container with Incorrect Gas
- 4/01 – ID/WIPP - Reversal of "O-Ring" Placement in TRUPACTs
- 5/11, SR/WIPP – Shipment to WIPP involved in accident near Ranger, TX



Transportation Community Awareness & Emergency Response (TransCAER®)

- EM Office of Transportation welcomed as an official TransCAER Partner (November 2006)
- DOE received the 2006 National TransCAER Chairman's Award
 - Secretary Bodman accepted the award on May 1, 2007



Upcoming EM TransCAER Efforts

- Planning underway for Commodity Flow Survey this summer on Interstate 70 in MD
- Initial planning for a TransCAER Workshop
 - Planned location is TN
 - Follow-on to the TN Commodity Flow Survey
 - Discussions underway with TEMA



EM TransCAER – Commodity Flow Surveys



Flagstaff Commodity Flow Survey

- August 10-11, 2005, Interstate 40 near Flagstaff, AZ
- 206 HazMat Vehicles (133 Westbound and 73 Eastbound) carrying 362 commodities (2.9M lbs HazMat material)

Texas/Louisiana Commodity Flow Survey

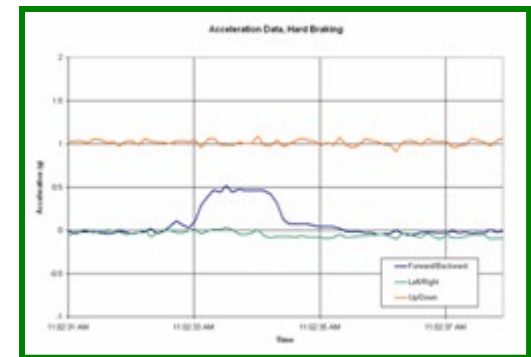
- April 12-13, 2006, Interstate 20 (Texas/Louisiana State Line)
- 495 HazMat Vehicles (263 Eastbound and 232 Westbound) carrying 605 commodities (7.1M lbs HazMat material)

Tennessee Commodity Flow Survey

- August 16-17, 2006, Interstate 40 near Jackson, TN
- 598 HazMat Vehicles (288 Eastbound and 310 Westbound) carrying 921 commodities (10.8M lbs HazMat material)

DOE/UNLVRF Truck Technology Study

- Demonstrated technological capabilities for DOE to improve driver performance, shipment safety, and emergency response:
 - Safety-Related Data Mining and Analysis,
 - Critical Event Reporting,
 - Automated Hours of Service Logging,
 - Collision Warning,
 - Trailer Tracking,
 - Emergency Response Reporting,
 - Incident Management.
- Document, recommend best practices and “ideal standards”



Incident Prevention Technologies

Trailer Tracking

Panic Button

Critical Event Reporting

Performance Monitoring

Collision Avoidance



EM Environmental Management

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UNLV Tracking Technology Study

- Two technology demonstrations were held:
 - Columbia, SC
 - Las Vegas, NV
- A Final Report is expected in June 2007

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Backup Information



EM *Environmental Management*

safety ❖ performance ❖ cleanup ❖ closure

Application of Technology to Enhance Motor Carrier Performance, Safety, and Emergency Preparedness

2003 Police-Reported Motor Vehicle Traffic Crashes

Crash Type	Large Trucks	All Vehicles
Fatal	4,289 (11%)	38,252
Injury	85,000	1,925,000
Property Damage Only	347,000	4,365,000
Total	436,000 (6.9%)	6,328,000

2005 Major Types of Large Truck Crashes*

Crash Type (Top 3)	Percent
Rear End	23.4%
Ran off Road/Out of Lane	17.7%
Side Swipe, Same Direction	10.6%

* FMCSA Report to Congress on the Large Truck Causation Study



Background

FMCSA Large Truck Crash Causation Study

All Trucks by Critical Reason

This table shows the estimated number of trucks involved in crashes nation-wide, in which the truck was assigned the critical reason for the crash. Counts of trucks are organized by critical reason.

Critical Reason	Number	Percentage
Driver Decision Factor	30,000	38%
Too fast for curve/turn	9,000	12%
Driver Recognition Factor	22,000	29%
Inadequate surveillance	9,000	12%
Physical Driver Factor	9,000	12%
Sleep, that is, actually asleep	5,000	7%
Vehicle Related Factor	8,000	10%
Cargo shifted	3,000	4%
Driver Performance Factor	4,000	6%
Overcompensation or poor directional control	4,000	6%
Unknown Driver Error	3,000	4%
Environment – Highway	2,000	2%

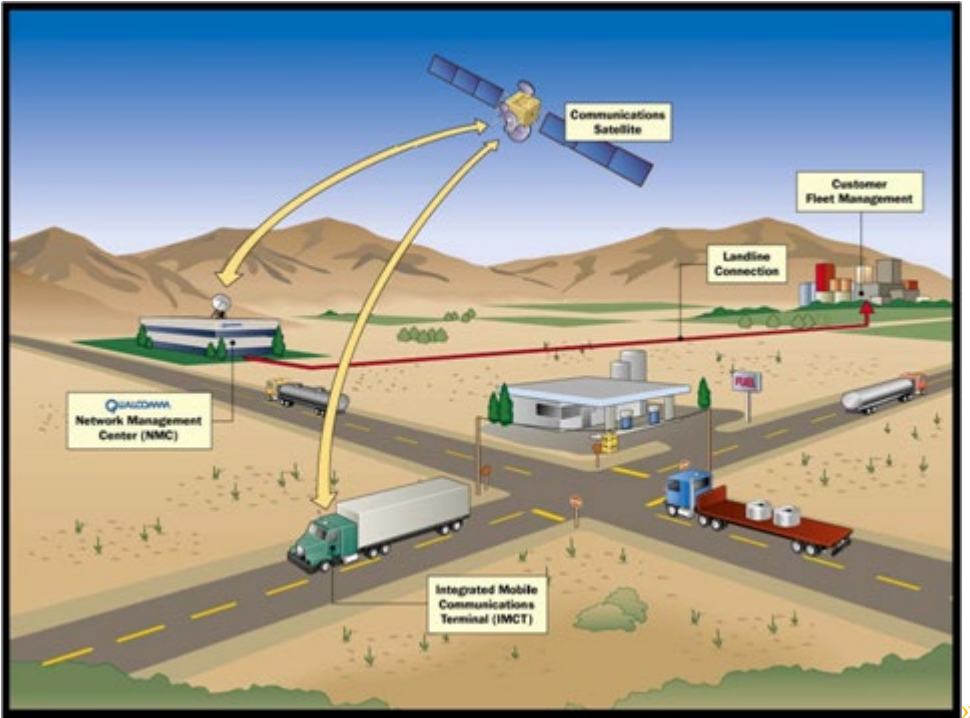
Satellite Communications



Mobile Communications Terminal

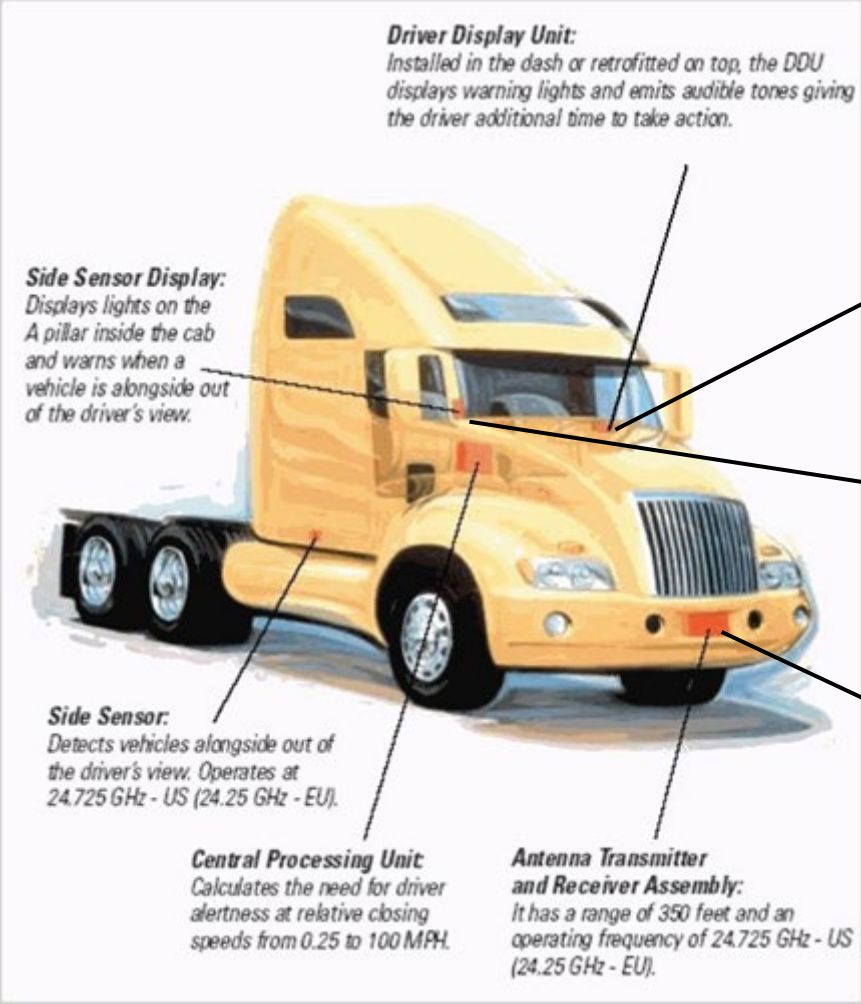


Operations Center



System Overview

Collision Avoidance Technology

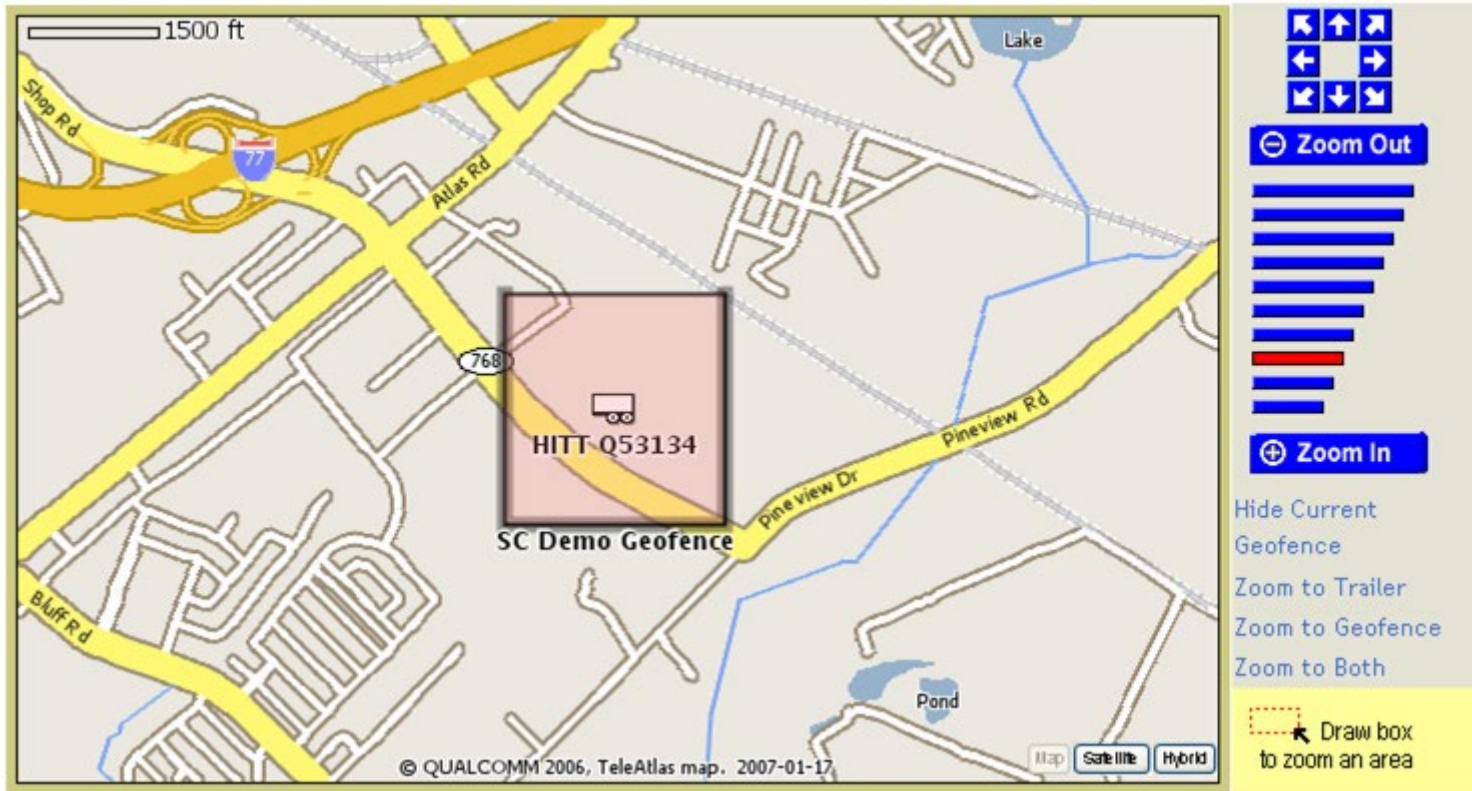


Photos from Hittman Demonstration Vehicle



Trailer Tracking & Virtual Boundaries

Position Details



Critical Event Reporting

QUALCOMM alert: Driver 1415 on truck 477864 reported a critical event on 04-05-06 at 8:18 AM PDT, 7 miles SSE of Encinitas, CA.

Incident

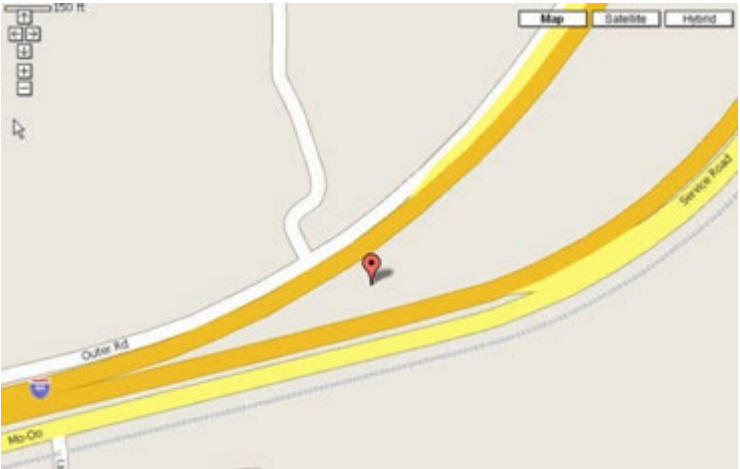
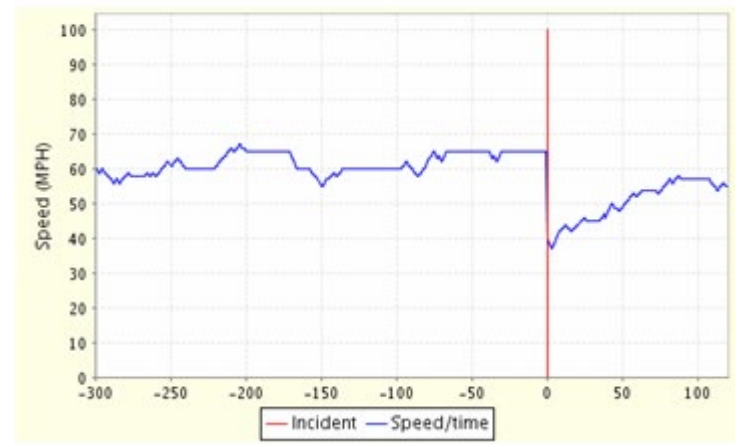
Time	4/5/06 8:31:56 AM PDT
Last known position	32.895, -117.194
Last known position time	4/5/06 8:31:55 AM PDT
Trigger event	Hard braking



Raw incident data

Absolute time	Offset (min:sec)	Speed (MPH)
4/5/06 8:18:29 AM PDT	-00:09	57.0
4/5/06 8:18:30 AM PDT	-00:08	57.0
4/5/06 8:18:31 AM PDT	-00:07	58.0
4/5/06 8:18:32 AM PDT	-00:06	58.0
4/5/06 8:18:33 AM PDT	-00:05	57.0
4/5/06 8:18:34 AM PDT	-00:04	57.0
4/5/06 8:18:35 AM PDT	-00:03	58.0
4/5/06 8:18:36 AM PDT	-00:02	58.0
4/5/06 8:18:37 AM PDT	-00:01	58.0
4/5/06 8:18:38 AM PDT	00:00	45.0

Incident graph



Performance & Safety Analysis

- Analysis of 33 drivers performance over a 90 Day period
- Over 678,000 combined miles
- Over 12,000 hours
- Measures monitored included:
 - Hard braking events
 - Coasting out of gear time
 - Over RPM time
 - Excessive speed time (>75 MPH)
- Goal is to provide carriers with data to better understand driver behavior, and identify risks

Performance & Safety Analysis

Hard Braking Events

Hard Braking: 7 mph or greater deceleration in 1 second

- 27 of 33 vehicles did not report a hard braking event
 - 3 vehicles reported one hard braking event
 - 1 vehicle reported three hard braking events
 - 1 vehicle reported seven hard braking events
- 1 vehicle reported eleven hard braking events. This vehicle was also the only one to report any “coast out of gear” time for the evaluation period

Performance & Safety Analysis

Time Spent in “Over RPM”

- 23 of 33 vehicles did not report any Over RPM time
- 3 vehicles reported less than 1 hour of Over RPM
- 2 vehicles reported 1-3 hours of Over RPM
- 4 vehicles reported 3-5 hours of Over RPM
- 1 vehicle reported 11 hours of Over RPM
- Of the 6 vehicles that reported hard braking events, 4 of them also reported Over RPM time.

Performance & Safety Analysis

Time Spent in Excess Speed

Excess Speed: 75 MPH or greater

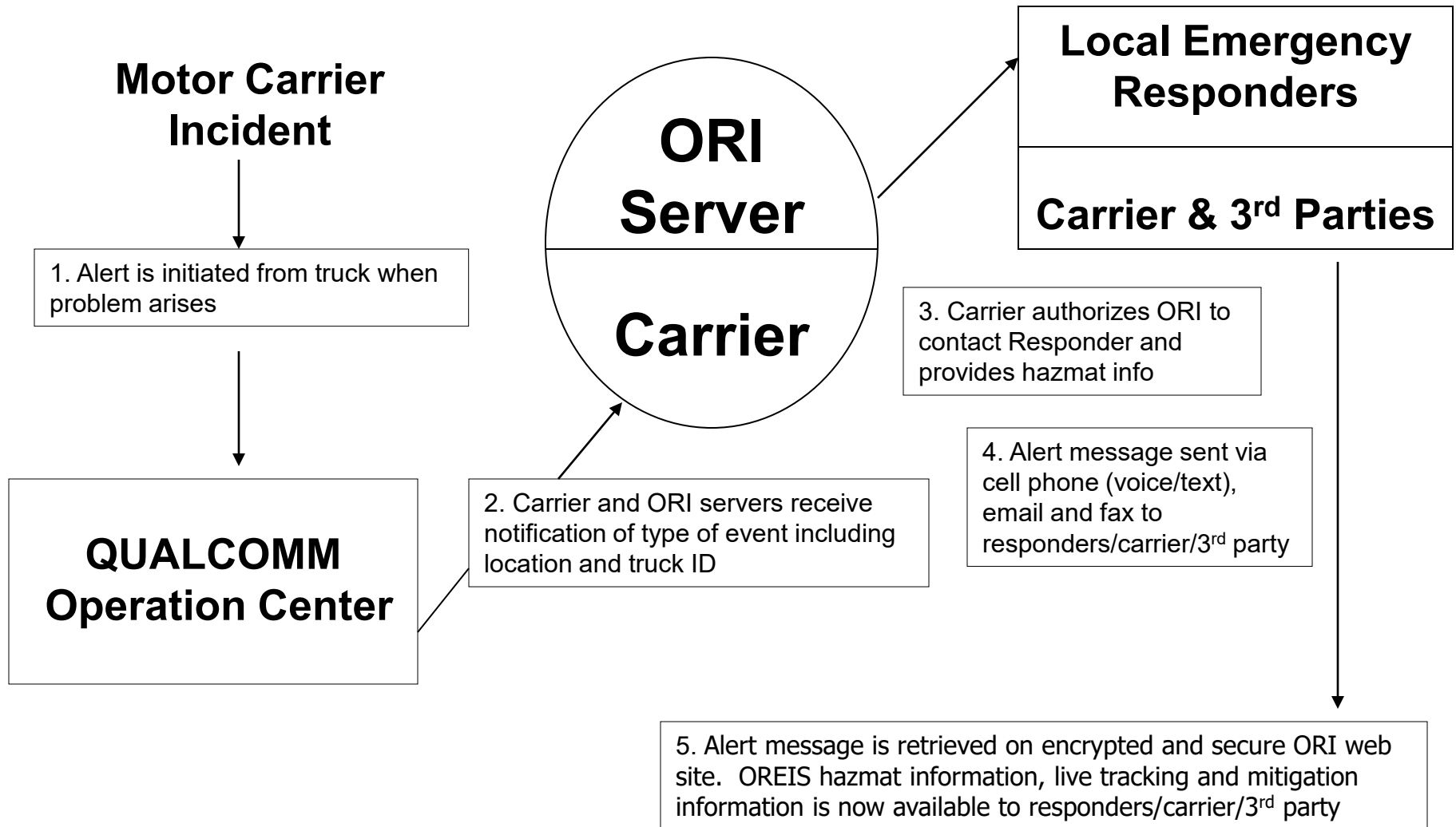
- 11 of 33 vehicles did not report any time in excess speed
- 18 vehicles reported less than 30 minutes of excess speed
- 3 vehicles reported about 1 hour of excess speed (average of about 500 hours per vehicle). These vehicles did not have any hard braking events, or Over RPM time.
- 1 vehicle reported over 8 hours (out of 470 total hours) of excess speed. This vehicle did not have any hard braking events, and only 10 minutes of Over RPM time.

Performance & Safety Analysis

Conclusions

- **These reports are a great way for carriers to stay “in-touch” with their drivers behavior, vs. the old method of having to manually download information from each vehicle**
- **Risk Mitigation: the data is useful for exposing weaknesses in driver behavior, so they do not become bad habits that may lead to possible incidents in the future**

Motor Carrier Tracking and Alert Data Flow



Motor Carrier Incident Alert

This is an emergency alert from Operation Respond. Go to <https://alert.oreis.org> on the web to view this alert.

- Sent to Responders, Carrier and Involved Third Parties
- Sent Via Cell Phone – Voice & Text
- Email
- Fax
- Use GPS Chip in Phone
- Text Message to NLETS & RISS
- Receipt Confirmed

Responsible Shipper: DOE Savannah River Site
Emergency Phone#: 803-725-1911
Responsible Carrier: Hittman Transportation Services
24 Hour Emergency Phone#: 800-607-6199

LAST LOCATION/TIME:
 Location: 2 Mi NNW of Columbia, SC
 Longitude: Latitude: Time:
 -81.042778 34.031113 01/17/2007 11:52:31 (Eastern Time)

Enable Map Refresh Disable Map Refresh



[Click for Mitigation Information](#)

Copyright Pending - Proprietary

***** Driver activated the PANIC BUTTON *****

Shipping Paper: [Click to View](#)

UNID(s): 2912

UN ID #: 2912

Guide Ref.: 162

Content(s):

Radioactive material, low specific activity (LSA), n.o.s. /
 Radioactive material, low specific activity (LSA-I)

Potential Hazards Public Safety Emergency Response
 Initial Isolation & Protective Action Distances
 Fire or Explosion Health Hazards

Potential Hazards: Fire or Explosion

Some of these materials may burn, but most do not ignite readily.
 Uranium and Thorium metal cuttings may ignite spontaneously if exposed to air (see GUIDE 136).
 Nitrates are oxidizers and may ignite other combustibles (see GUIDE 141).

Vehicle Position History

- 10) Time: 01/16/2007 17:02:43 (Eastern Time)
 Location: 2 Mi NNW of Columbia, SC
 Position: Lon=-81.041664 Lat=34.030834
- 9) Time: 01/16/2007 16:00:28 (Eastern Time)
 Location: 2 Mi NNW of Columbia, SC
 Position: Lon=-81.043053 Lat=34.031113
- 8) Time: 12/14/2006 14:31:28 (Eastern Time)
 Location: 4 Mi NNE of Dutch Fork, SC
 Position: Lon=-81.088333 Lat=34.105278
- 7) Time: 12/14/2006 14:16:30 (Eastern Time)

http://www.trustcomplete.com - VRT GIS Response Mitigation Information - Microsoft Internet Explorer

VRT GIS Response Mitigation Information

Incident Location: Latitude: 34.031113 , Longitude: -81.042778
Generating Map. Please Wait.

Latitude:

Longitude:

Show Business Types:

- Schools
- College/University
- Child Care
- Nursing Care
- Assisted Living
- Hospitals
- Public Venues
- Amusement Parks / Recreation Centers
- Zoo / Gardens / Parks / Museums
- Golf Course / Recreational Camps
- Gambling
- Fire
- Police

Radius for Search:

<input type="radio"/> 1/2 mile	<input checked="" type="radio"/> 1 mile
<input type="radio"/> 2 mile	<input type="radio"/> 3 mile
<input type="radio"/> 4 mile	<input type="radio"/> 10 mile

Copyright Pending - Proprietary

The map displays a street grid with a blue rectangular search radius centered on the incident location. Several business types are marked with colored pins: purple pins for Schools and Police, and green pins for Hospitals and Public Venues. Labeled streets include Clemency Rd, Main St, Sunset Dr, River Dr, and Columbia Jr College of Bus. Highway shields for 176, 215, 277, and 321 are visible. A red truck icon is positioned on Sunset Dr. Map controls (directional arrows, zoom in/out) are in the top left. Map style buttons (Map, Satellite, Hybrid) are in the top right. A Google logo and 'Map data ©2007 TeleAtlas - Terms of Use' are at the bottom of the map area.

Done Internet



VRT GIS Response Mitigation Information - Windows Internet Explorer
 http://www.trustcomplete.com/nvmap.aspx?Lat=34.031113&Lon=-81.042778

VRT GIS Response Mitigation Information

Incident Location: Latitude: 34.031113 , Longitude: -81.042778
 Lat: 34.04327202221684, Lon: -81.04202270507812: center of map

Latitude:
 Longitude:

Show Business Types:

- Schools
- College/University
- Child Care
- Nursing Care
- Assisted Living
- Hospitals
- Public Venues

Map | Satellite | Hybrid

Richland County of, Richland County Schools
 Elementary and Secondary Schools
 (803) 735-3421
 4200 Main St (1)
 Columbia SC 29203
 Lat: 34.041262 Lon:-81.038865
 (0.73572 miles from incident.)

Locations found in the region of 1 mile West to 1 mile East and 1 mile North to 1 mile South:

- All Other Outpatient Care Centers 5 found.
- Colleges, Universities, and Professional Schools 3 found.
- Elementary and Secondary Schools 3 found.
- General Medical and Surgical Hospitals 6 found.

Colleges, Universities, and Professional Schools

South University
 (803) 799-9082
 3810 Main St (1)
 Columbia SC 29203
 Lat: 34.036333 Lon:-81.041292
 (0.37035 miles from incident.)

Lutheran Theological Southern Seminary
 (803) 786-5150
 4201 Main St (1)

Locations Report | Excel Report | High Resolution Map

Done | Internet | 100%

Responsible Railroad: Norfolk Southern
24 Hour Emergency Phone#: 800-453-2530

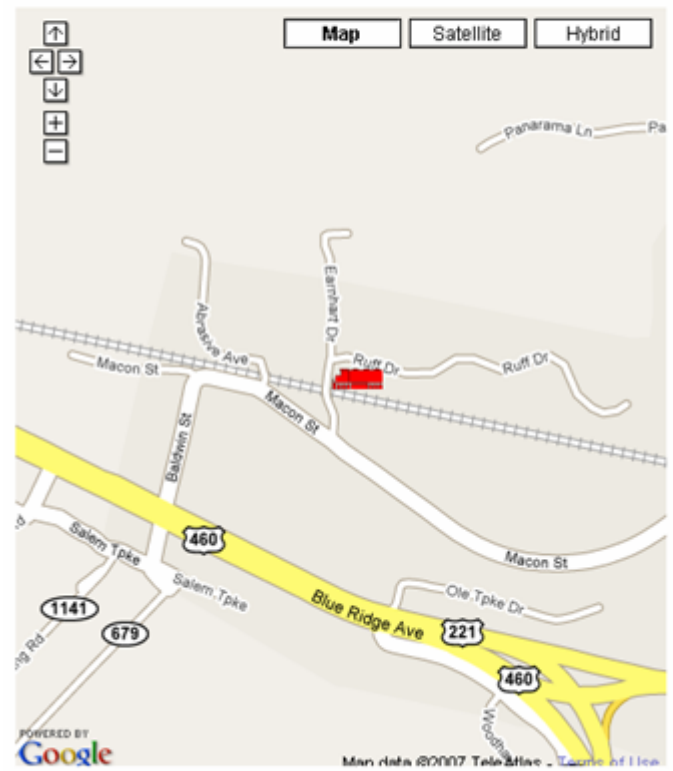
Locomotive ID: 21000

LAST GPS LOCATION/TIME:

Longitude: Latitude: Time:
 -79.55068 +37.34226 1/19/2007 11:59:16 AM (EST)

Additional Information:

- 1) Tank car ID: UTLX12345
 Mile Post: 111



Copyright Pending - Proprietary

***** Engineer activated the PANIC BUTTON *****

HAZARDOUS MATERIAL CARGO: (click STCC for detail)

STCC: 4908110

UN ID #: 1114 Guide Ref.: 130

Content(s):
 Benzene

- Potential Hazards
- Public Safety
- Emergency Response
- Initial Isolation & Protective Action Distances
- Fire or Explosion
- Health Hazards

Potential Hazards: Fire or Explosion

HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.
 Vapors may form explosive mixtures with air.
 Vapors may travel to source of ignition and flash back.
 Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
 Vapor explosion hazard indoors, outdoors or in sewers.
 Those substances designated with a "P" may polymerize explosively when heated or involved in a fire.
 Runoff to sewer may create fire or explosion hazard.
 Containers may explode when heated.
 Many liquids are lighter than water.

Vehicle Position History

- 10) Time: 1/16/2007 2:23:46 PM (Eastern Time)
 Position: Lon= -71.26742 Lat=+42.38761
 Message Type: PANIC BUTTON
- 9) Time: 1/16/2007 1:59:44 PM (Eastern Time)
 Position: Lon= +0.00000 Lat=+0.00000
 Message Type: PANIC BUTTON
- 8) Time: 1/16/2007 1:55:08 PM (Eastern Time)
 Position: Lon= +0.00000 Lat=+0.00000
 Message Type: PANIC BUTTON
- 7) Time: 1/16/2007 1:50:39 PM (Eastern Time)