Driving Toward Excellence in Transportation & Logistics Operations & Safety

Dr. Dennis Ashworth
Director, Office of Transportation
Department of Energy’s Office of Environmental Management

- EM is the largest cleanup project in the world:
  - 114 sites
  - 31 states
  - 2,000,000 acres
- EM scope includes remediation, processing and transportation of approximately:
  - 25 tons of plutonium
  - 108 tons of plutonium residues
  - 88 million gallons of radioactive liquid waste
  - 2,500 tons of spent nuclear fuel
  - 137,000 cubic meters of transuranic waste
  - 1.3 million cubic meters of low-level waste
U.S. Department of Energy, Environmental Management, Office of Transportation
Dedicated to Protecting the Public and the Environment in all our Transportation Operations

EM Sites & Transportation Operations

From Naval Reactor sites located in several states

To Waste Isolation Pilot Plant

To Waste Isolation Pilot Plant

To Oak Ridge Treatment

To Oak Ridge Treatment

To Permafix

To Permafix

To Nevada Test Site

From Naval Reactor sites located in several states

Pacific EcoSolutions

Stanford Linear Accelerator

Lawrence Livermore

Nevada Test Site

Idaho National Lab

EnergySolutions

Rocky Flats

Waste Isolation Pilot Plant

Waste Control Specialists

Oak Ridge

Paducah

Miamisburg

Columbus

Portsmouth

West Valley

Brookhaven

Hanford

Fermi

Los Alamos

Panducah

To Hanford

To Hanford

To Permafix

To Nevada Test Site

Savannah River
EM is one of the Largest Hazmat Shippers in the Federal Government

**FY05 Shipments**
- TRU: 940
- NM: 260
- MLLW: 1,880
- LLW: 14,830
- DUF$_6$: 4,000
- Total: 22,100

**FY06 Shipments**
- TRU: 1,150
- NM: 20
- MLLW: 720
- LLW: 11,770
- DUF$_6$: 400
- Total: 14,060

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Rocky Flats Status

- All shipments completed and Kaiser-Hill has declared physical completion at the site
- RF shipments continue from WCS to EnergySolutions
  - Expect completion in CY 2006
Fluor Fernald presented DOE with its declaration of physical completion on October 29, 2006.

The 3,776th and final canister of treated Silos 1 and 2 byproduct was shipped off site May 26, 2006.

The last of 5,100 cubic yards of waste from Silo 3 was shipped off site April 11, 2006.
Mound/Miamisburg Status

- Physical completion July 2006
  - except for Operating Unit 1 which is outside of contract

Battelle Columbus

- Physical completion declared June 2006
DUF₆ (Depleted Uranium Hexafluoride)

- Destination: Portsmouth Ohio Gaseous Diffusion Plant
- Material: Depleted Uranium Hexafluoride
- ~6000 cylinders shipped
- Passed Thru: TN, KY, OH
- Completed shipping campaign: December, 2006
DUF₆ Conversion Project Overview

- Physical construction of the two conversion facilities is scheduled for completion in Fall 2007.
- Operations are expected to begin by June 2008.
- First waste shipment anticipated in August 2008.
DUF₆ Conversion Process

Steam & Hydrogen
UF₆ Autoclave
UF₆ Conversion Reactor
HF Recovery
Uranium Oxide Hopper
Uranium Oxide in Cylinders
HF Byproduct
HF Storage

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**DUF₆ Conversion & Transport**

- Conversion process will fill approximately 3,000 cylinders containing uranium oxide per year:
  - 1,100 at the Portsmouth Facility (10,800 MTU oxide)
  - 1,900 at the Paducah Facility (14,300 MTU oxide)

- Cylinders currently used to store DUF₆ will be used to ship uranium oxide and are DOT compliant.

- Covered gondola railcars used to successfully transport waste from the Fernald Closure Project will be utilized to transport uranium oxide cylinders.
Uranium Oxide Transportation
Logistics

- Each uranium oxide cylinder will weigh between 14 and 18 tons.
- 11 railcars are planned to be shipped from the DUF$_6$ Conversion facilities each week.
  - Group of 5 or 6 railcars will be shipped from each site on a weekly basis.
- Each gondola railcar will contain up to 6 cylinders
- Disposal options include Nevada Test Site (NTS) and EnergySolutions in Utah (formally Envirocare of Utah)
  - Shipments to NTS will require a transload facility.
- Standard commercial rail and truck shipment routes.
1/24/2007 WIPP receives first shipment of Remote-Handled Transuranic Waste

Total = 5400 (as of 1/29/07)

FY’07 TRU Shipments
- INL = 221
- LANL = 29
- SRS = 43
- RL = 20
Our Vision -

- We’ll be leaders in achieving transportation safety and operational excellence.
- We’ll use best practices from government and industry to provide our internal and external customers with the highest value planning, compliance and operational expertise.
EM Office of Transportation

Our Measures of Success –

- EM shipments are measurably safer;

- Our services are sought, and our practices emulated by other government programs and private industry;

- Federal, State, Tribal and local officials, affected parties, and the public actively support and participate in our work.
How Do We Measure Our Performance?

- Key Performance Metric: Transportation Incidents/10,000 Shipments

- EM transportation incident criteria:
  - Any release of an EM material during transportation;
  - Any injury (either outpatient, first aide, 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:
- In FY 2004, EM had 23 reported off-site incidents.
  - Most significant incident was the release of radioactive material onto road surfaces at Oak Ridge – DOT reportable
  - FY ‘04 Incident Rate = 23/2.0 = 11.5 Incidents/10,000 Shipments

FY 2005 Transportation Incidents:
- In FY’05, EM had 15 reported off-site incidents.
  - Most significant incident was rain water in BNL railcar
  - FY’05 Incident Rate = 15/2.2 = 6.8 Incidents/10,000 Shipments
  - No DOT HazMat Reportables

FY 2006 Transportation Incidents:
- In FY’06, EM had 27 transportation events (22 incidents).
  - FY’06 Incident Rate = 22/1.4 = 15.7 Incidents/10,000 Shipments
  - No DOT HazMat Reportables
What Have We Learned?

FY'06 EM Transportation Event Categories

- Collisions
- Site Inspect./Proced.
- Doc./Characterization
- Load Securement
- Transport Equip. Failure
- Driver Awareness/Skill

Number Incidents

U.S. Department of Energy, Environmental Management, Office of Transportation
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DOE-EM Transportation Events

FY’06 Truck Events:
• 10/19/05 – DUF6 truck side-swiped by private vehicle, no injuries and minor damage to truck/trailer.
• 12/7/05 – Collision with Ford Truck at intersection in Los Alamos, NM.
• 12/27/05 - Truck pulling three empty TRUPACT-II packages left the road and trailer near Blackfoot, ID.
• 6/2/06 - Truck carrying TRUPACTs was rear-ended outside of Downey Idaho with minor damage to the trailer.
• 7/13/06 - While changing lanes to avoid object truck over corrected and left road. Minor damage and Level VI insp.
• 7/18/06 - Passenger car hit front bumper of TRU tractor while entering I-15. Minor damage, passenger driver cited.
Transportation Review Prioritization – allowing us to focus our efforts for the benefit of the public and environment

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Site 1</td>
<td>Site A</td>
<td>LLW</td>
<td>Rail</td>
<td>4,641,000</td>
<td>442</td>
<td>2,117</td>
<td>9.82E+09</td>
<td>716,767</td>
<td>3.17E+08</td>
<td>4</td>
<td>4</td>
<td>16</td>
<td>9</td>
<td>144</td>
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<tr>
<td>Site 2</td>
<td>Site B</td>
<td>TRU</td>
<td>Truck</td>
<td>114,000</td>
<td>366</td>
<td>716</td>
<td>8.16E+07</td>
<td>185,646</td>
<td>6.79E+07</td>
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<td>9</td>
<td>12</td>
<td>108</td>
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<td>Site C</td>
<td>MLLW</td>
<td>Truck</td>
<td>6,709</td>
<td>6</td>
<td>2,426</td>
<td>1.63E+07</td>
<td>816,948</td>
<td>4.90E+06</td>
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<td>3</td>
<td>9</td>
<td>9</td>
<td>81</td>
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<tr>
<td>Site 4</td>
<td>Site A</td>
<td>MLLW</td>
<td>Truck</td>
<td>25,032</td>
<td>66</td>
<td>296</td>
<td>7.14E+06</td>
<td>102,480</td>
<td>6.76E+06</td>
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<td>3</td>
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<td>Site D</td>
<td>LLW</td>
<td>Truck</td>
<td>22,905</td>
<td>22,905</td>
<td>6</td>
<td>1.37E+05</td>
<td>108</td>
<td>2.47E+06</td>
<td>2</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td>54</td>
</tr>
<tr>
<td>Site 5</td>
<td>Site E</td>
<td>LLW</td>
<td>Truck</td>
<td>19,400</td>
<td>52</td>
<td>385</td>
<td>7.47E+06</td>
<td>674,357</td>
<td>3.51E+07</td>
<td>2</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td>54</td>
</tr>
</tbody>
</table>

Methodology based on:
- Type of material to be transported
- Volume of Material to be Transported
- Number of Annual Shipments
- Trip Distance
- Population Along Route
- Prior Year Incidents
Application of Technology to Enhance Motor Carrier Performance, Safety, and Emergency Preparedness
Background

2003 Police-Reported Motor Vehicle Traffic Crashes

<table>
<thead>
<tr>
<th>Crash Type</th>
<th>Large Trucks</th>
<th>All Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal</td>
<td>4,289 (11%)</td>
<td>38,252</td>
</tr>
<tr>
<td>Injury</td>
<td>85,000</td>
<td>1,925,000</td>
</tr>
<tr>
<td>Property Damage Only</td>
<td>347,000</td>
<td>4,365,000</td>
</tr>
<tr>
<td>Total</td>
<td>436,000 (6.9%)</td>
<td>6,328,000</td>
</tr>
</tbody>
</table>

2005 Major Types of Large Truck Crashes*

<table>
<thead>
<tr>
<th>Crash Type (Top 3)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear End</td>
<td>23.4%</td>
</tr>
<tr>
<td>Ran off Road/Out of Lane</td>
<td>17.7%</td>
</tr>
<tr>
<td>Side Swipe, Same Direction</td>
<td>10.6%</td>
</tr>
</tbody>
</table>

*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.

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

- Demonstrate 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”
Study Participants

- University of Nevada Las Vegas Research Foundation
- UNLV College of Engineering
- QUALCOMM
- Operation Respond
- Visual Risk Technologies
- Tri-State Motor Transit
- Hittman Transport Services
- Commercial Vehicle Safety Alliance
- US Department of Energy
Collision Avoidance Technology

Driver Display Unit:
Installed in the dash or retrofitted on top, the DDU displays warning lights and emits audible tones giving the driver additional time to take action.

Side Sensor Display:
Displays lights on the A pillar inside the cab and warns when a vehicle is alongside out of the driver's view.

Side Sensor:

Central Processing Unit:
Calculates the need for driver alertness at relative closing speeds from 0.25 to 100 MPH.

Antenna Transmitter and Receiver Assembly:
It has a range of 550 feet and an operating frequency of 24.725 GHz - US (24.25 GHz - EU).

Photos from Hittman Demonstration Vehicle

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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.

<table>
<thead>
<tr>
<th>Incident</th>
<th>Raw incident data</th>
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<tbody>
<tr>
<td>Time</td>
<td>Absolute time</td>
</tr>
<tr>
<td></td>
<td>Offset (min:sec)</td>
</tr>
<tr>
<td>4/5/06 8:18:29 AM PDT</td>
<td>-00:09</td>
</tr>
<tr>
<td>4/5/06 8:18:30 AM PDT</td>
<td>-00:08</td>
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<tr>
<td>4/5/06 8:18:31 AM PDT</td>
<td>-00:07</td>
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<tr>
<td>4/5/06 8:18:32 AM PDT</td>
<td>-00:05</td>
</tr>
<tr>
<td>4/5/06 8:18:33 AM PDT</td>
<td>-00:05</td>
</tr>
<tr>
<td>4/5/06 8:18:34 AM PDT</td>
<td>-00:04</td>
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<td>4/5/06 8:18:35 AM PDT</td>
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<tr>
<td>4/5/06 8:18:36 AM PDT</td>
<td>-00:02</td>
</tr>
<tr>
<td>4/5/06 8:18:37 AM PDT</td>
<td>-00:01</td>
</tr>
<tr>
<td>4/5/06 8:18:38 AM PDT</td>
<td>00:00</td>
</tr>
</tbody>
</table>

Last known position: 32.885, -117.194

Last known position time: 4/5/06 8:01:55 AM PDT

Trigger event: Hard braking
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

1. Alert is initiated from truck when problem arises

2. Carrier and ORI servers receive notification of type of event including location and truck id

3. Carrier authorizes ORI to contact Responder and provides hazmat info

4. Alert message sent via cell phone (voice/text), email and fax to responders/carrier/3rd party

5. Alert message is retrieved on encrypted and secure ORI web site. OREIS hazmat information, live tracking and mitigation information is now available to responders/carrier/3rd party

ORI Server

QUALCOMM Operation Center

Carrier

Local Emergency Responders

Carrier & 3rd Parties
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
# Notification List

## Richland County

<table>
<thead>
<tr>
<th>Agency</th>
<th>Person</th>
<th>Address</th>
<th>City</th>
<th>Phone</th>
<th>Fax</th>
<th>Pager</th>
<th>Mobile</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Departments</td>
<td>Al Axson</td>
<td>1800 Laurel Street</td>
<td>Columbia</td>
<td>8035453731</td>
<td></td>
<td></td>
<td></td>
<td><a href="mailto:cbaxson@columbia.sc.gov">cbaxson@columbia.sc.gov</a></td>
</tr>
<tr>
<td>Law Enforcement</td>
<td>Debbie Jordan</td>
<td>1 Justice Square</td>
<td>Columbia</td>
<td>8035453509</td>
<td></td>
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<td></td>
<td><a href="mailto:dbcollum@columbia.sc.gov">dbcollum@columbia.sc.gov</a></td>
</tr>
<tr>
<td>County Agency</td>
<td>Nathan Brown</td>
<td>1410 Laurens Street</td>
<td>Columbia</td>
<td>8032558933</td>
<td>8037826182</td>
<td>8037485055</td>
<td>8033550300</td>
<td><a href="mailto:cnrbrown@columbia.sc.gov">cnrbrown@columbia.sc.gov</a></td>
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<tr>
<td>Richland County Emergency Services</td>
<td>George Mick</td>
<td>1410 Laurens Street</td>
<td>Columbia</td>
<td>8038968384</td>
<td>8037826182</td>
<td>8037485055</td>
<td>8033550300</td>
<td><a href="mailto:gpmack@columbiaonline.com">gpmack@columbiaonline.com</a></td>
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</tbody>
</table>

## NLETS Users

| Richland County Sheriff                      |                 |                     |        |                |                |                |               | ayvdtham@cited.sc.gov |
| SC Emergency Management                      | *ORI* SC040000 | 5623 Two Notch Road | Columbia | 8035763000  |                |                |               |                     |
| SC Law Enforcement Division                  | *ORI* SC040000 | 1100 Fish Hatchery Road | Columbia | 8037378500  |                |                |               |                     |
| SC Highway Patrol                            | *ORI* SC040000 | 4400 Broad River Road | Columbia | 8038967038  |                |                |               | syndham@cited.sc.gov |
| SC DHEC                                      | Sandra Threatt  | 2600 Bull Street    | Columbia | 8032536488  | 80339204840 | 8038964181   | 8038964242 |                     |
| SC DHEC                                      | Micheal Moore   | 2600 Bull Street    | Columbia | 8038964181   | 8038964242   |                |               |                     |
| SC Emergency Management Division             | Ernie Moore     | 2779 Fish Hatchery Road | W. Columbia | 8037378500  |                |                |               |                     |
| SC Emergency Management Division             | Tim Murphy      | 2779 Fish Hatchery Road | W. Columbia | 8037378582  |                |                |               |                     |
| SC Emergency Management Division             | Scot Freeman    | 2779 Fish Hatchery Road | W. Columbia | 8037378500  |                |                |               |                     |
| SC Department of Transportation              | Dan Campbell    | P O Box 191         | Columbia | 8037372314  |                |                |               |                     |
| SC Highway Patrol                            | Captain Jones Gamble | 10311 Wilson Blvd | Bythewood | 8038967920  |                |                |               |                     |
| SC Emergency Response Task Force             | Emory Johnson   | 141 Monticello Trail | Columbia | 8038969836   | 8038969856   |                |               |                     |

## State Agencies

| Additional Agencies                          |                  |                     |        |                |                |                |               |                     |
| SRS 911 Center-Washington Group              | John Riley       | SRS Building 703-A  | Aiken  | 8037251911    | 8035076227   | 8035077795   | 8035077795   | john.riley@srs.gov |
| DOE TEPP                                    | Cindy Brizes     | SRS Building 730-B  | Aiken  | 8037251911    | 8035076227   | 8035077795   | 8035077795   | cindy.brzes@srs.gov |
| DOE National Watch Center*Simulated          | Ella McNeil      | 19001 Germantown Road | Germantown | 80306076199  | 2406766469   | 80306076199  | 2406766469   | ella.mcneil@em.doe.gov |
| Hittman Transport                           | Roger Betow      | Dispatch Center     | Barnwell | 80306076199  | 80306076199  | 80306076199  | 80306076199  | rcbetow@energysolutions.com |
| Technical Resources Group (DOE)              | Ken Keaton       | 125 Broughton Drive  | Aiken  | 8034748000   | 2085288919   | 8034748000   | 2085288919   | kek33t@bellsouth.net |
VRT GIS Response Mitigation Information

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

Latitude:
34.031113

Longitude:
-81.042778

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:
- 1/2 mile
- 1 mile
- 2 mile
- 3 mile
- 4 mile
- 10 mile

Locations Report Excel Report

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

Locomotive ID: 21000
LAST GPS LOCATION/TIME:
Longitude: -79.55008
Latitude: +37.34226
Time: 1/19/2007 11:59:16 AM (EST)

Additional Information:
Tank car ID: UT-12345
Ride Post: III

*** Engineer activated the PANIC BUTTON ***

HAZARDOUS MATERIAL CARGO: Benzene
STCC: 4908110

UN ID #: 1114
Guide Ref.: 130

Content(s):
Benzene

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 “D” 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:
   Position: Lon= -71.26746
   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)
**DOE Load Securement Field Guide & Checklist**

- Developed to ensure all shipments are secured prior to shipment

<table>
<thead>
<tr>
<th>SECTION 4: SPECIFIC CONTAINER &amp; MATERIAL TYPES</th>
<th>YES</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>REQUIREMENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRUMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1.1  For all drums, verify/validate drums are placed and secured on vehicle ensuring that they do not shift and/or rub closure rings and/or locking bolts during normal transportation 173.427(a)(6)(iii), 173.448(a), 177.834(a) &amp; 177.842(b) NOTE: It is suggested the ring locking bolts be rotated 45 degrees to the perpendicular axis of trailer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1.2  When needed for loose drums, verify/validate use of load locks, load straps, and/or load bars (used to reduce sidewall flex and strengthen sidewall securement capacity) in combination throughout the length of the load to ensure that the drums do not shift or tip during transport.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1.3  For drums on pallets, verify/validate drums are secured properly to and on the pallet to ensure they do not shift on pallet during normal transportation. 177.834(a) NOTE: It is suggested that ring locking bolts be rotated 45 degrees to the perpendicular axis of trailer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BURRITO LINERS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2. Bed of trailer is free of protrusions that could tear, or that could impede offloading of the burrito liner.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Improved Tracking of our Performance

Calculation of Incidents Rates/Million Miles:

**FY05 Incident Rates**
- \( \frac{15}{22,103} = \frac{6.79}{10,000} \) shipments
- \( \frac{15}{17,939,000} = \frac{0.84}{1,000,000} \) miles

**FY06 Incident Rates**
- \( \frac{22}{14,060} = \frac{15.65}{10,000} \) shipments
- \( \frac{22}{13,300,000} = \frac{2.03}{1,000,000} \) miles
Transportation Emergency Preparedness & Outreach Support

- Transportation Emergency Preparedness Program (TEPP)
  - Planning, training, technical assistance
- Increased dedication to working closely with states and tribes to ensure open and honest dialogue, understanding, and cooperation
  - Commodity flow surveys, TransCAER workshops, and Regional state cooperative organizations
National Fire Protection Agency Standards
- NFPA 472: Standard for Professional Competence of Responders to Hazardous Materials Incidents
  - Comment period closed 9/06
  - Goes for full committee approval in June 2007
  - Expected to be issued in late Summer 2007

Decon Video
- Filmed in Idaho Falls (with support from ID Falls Fire Department) in 9/06
- Designed to complement existing TEPP videos
- Serve as a training aid

TEPP Exercises
- West Valley, NY
  - Conducted September 19
- Wyandotte County, KS
  - Conducted November 9
- Muscatatuck Urban Training Center, Indiana
  - Scheduled for February 2007

FY 2006 MERRTT
- 1,487 trained
EM Transportation Community Awareness & Emergency Response (TransCAER)

- EM Office of Transportation Official TransCAER Partner
- Commodity Flow Surveys
  - Conducted along EM Transportation Highway and Rail Routes
    - Provide local communities information on types, volumes, and frequencies of hazardous materials transported through counties/cities
    - Allow local fire, LEPCs, and police to better prepare for potential transportation incident response.

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Flagstaff Commodity Flow Survey
- August 10-11, 2005, Interstate 40 at Parks Rest Area
  24-hours (9am 8/10 to 9am 8/11)
- Participants included Arizona DOT, Flagstaff Fire Department, and DOE
- 206 HazMat Vehicles were recorded during the Survey (133 Westbound and 73 Eastbound) carrying 362 Commodities

Texas/Louisiana Commodity Flow Survey
- April 12-13, 2006, Interstate 20 (Texas/Louisiana Border),
  24-hours (9am 4/12 to 9am 4/13)
- Participants: Wascom TX and Greenwood LA Fire Departments, LA and TX DOT, Caddo Parish and Harrison County LEPCs
- 495 HazMat Vehicles (263 Eastbound and 232 Westbound)
### Tennessee Commodity Flow Survey

- **August 16-17, 2006, Interstate 40 near Jackson, 24-hours (9am 8/16 to 9am 8/17)**

- **Participants included Tennessee Emergency Management Association (TEMA), Tennessee Highway Patrol, Tennessee DOT, local Fire Departments**

<table>
<thead>
<tr>
<th>Placard</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>390</td>
</tr>
<tr>
<td>8</td>
<td>233</td>
</tr>
<tr>
<td>2.2</td>
<td>77</td>
</tr>
<tr>
<td>9</td>
<td>72</td>
</tr>
<tr>
<td>2.1</td>
<td>41</td>
</tr>
<tr>
<td>5.1</td>
<td>25</td>
</tr>
<tr>
<td>6.1</td>
<td>21</td>
</tr>
<tr>
<td>2.3</td>
<td>16</td>
</tr>
<tr>
<td>4.1</td>
<td>11</td>
</tr>
<tr>
<td>1.1</td>
<td>8</td>
</tr>
<tr>
<td>5.2</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>1.3</td>
<td>4</td>
</tr>
<tr>
<td>4.2</td>
<td>3</td>
</tr>
<tr>
<td>4.3</td>
<td>3</td>
</tr>
<tr>
<td>Dangerous</td>
<td>2</td>
</tr>
<tr>
<td>1.4</td>
<td>1</td>
</tr>
<tr>
<td>6.2</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Total 744
Tennessee Commodity Flow Survey

- Location: Along Interstate 40 in Haywood County, Tennessee, at the State Tennessee Weigh Stations near I-40 Milepost 50

- Duration: 24-hours (9:00am August 16 to 9:00am August 17)

- 598 HAZMAT Vehicles (288 Eastbound and 310 Westbound) of approximately 8200 commercial vehicles (7.3% Hazmat) were recorded during the 24-hr period

- Carrying 920 HAZMAT shipments, totaling 10.7 Million pounds.
Flagstaff
Commodity Flow Survey

Top 25 Commodities by Count

Commodity

- Corrosive Liquid
- Gasoline
- Paint
- Flammable
- Liquid
- Sodium
- Hydroxide
- Resin
- Batteries
- Battery Fluid
- Diesel
- Explosives
- Toxic
- Phosphoric Acid
- Isopropanol
- Sulfuric Acid
- Hydrochloric Acid
- Environmentally Hazardous
- Acetone
- Amines
- Corrosive Solids
- Extracts
- Lighter refills
- Fire Extinguishers
- Peroxide
- Helium
- Alcohol
Texas/Louisiana Commodity Flow Survey

Truck Count by Hour (East and West)

0 5 10 15 20 25 30 35 40


Date/Hour

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Chart 6 - Count of Truck Types

Truck Type
Van
MC306
MC307
Double Van
MC406
MC338
MC312
Flat Bed
MC407
MC331
ISO Container
MC412
Iso Tank
Flat Bed w/Container
Open Top
Flat Drop Bed
Beverage Trailer
Intermodal
Dromedary
ISO
Chart 7 - Freight Weight by Trailer Type

- MC306
- Van
- MC307
- MC312
- MC338
- Double Van
- MC407
- ISO Container
- Iso Tank
- MC331
- Flat Bed
- Flat Drop Bed
- Open Top
- MC412
- Intermodal
- Beverage Trailer
- MC406
- Dromedary

Weight (Lbs)
Tennessee Commodity Flow Survey

Chart12 - Emergency Response Guidebook (ERG) Numbers by Count

Guide Number

Count

0 50 100 150 200 250 300 350

Total 290 157 63 47 44 39 25 24 22 18 17 16 15 13 13 13 12 11 9

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## Commodity Flow Survey Data

<table>
<thead>
<tr>
<th>Time</th>
<th>Trailer Type</th>
<th>Direction</th>
<th>Trailer Placard</th>
<th>Hazard Class</th>
<th>Material ID</th>
<th>Material PSN</th>
<th>ERG Guide Number</th>
<th>Quantity (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Van</td>
<td>East</td>
<td>9</td>
<td>Miscellaneous</td>
<td>3082</td>
<td>Environmentally Hazardous Substance</td>
<td>171</td>
<td></td>
</tr>
<tr>
<td>9:10</td>
<td>MC306</td>
<td>West</td>
<td>3</td>
<td>Flammable Liquid</td>
<td>1863</td>
<td>Fuel, aviation, turbine engine</td>
<td>128</td>
<td>63,000</td>
</tr>
<tr>
<td>9:15</td>
<td>MC331</td>
<td>West</td>
<td>2.1</td>
<td>Flammable Gas</td>
<td>1075</td>
<td>Propane</td>
<td>115</td>
<td>41,200</td>
</tr>
<tr>
<td>9:25</td>
<td>MC306</td>
<td>West</td>
<td>3</td>
<td>Flammable Liquid</td>
<td>1203</td>
<td>Gasoline</td>
<td>128</td>
<td>54,000</td>
</tr>
<tr>
<td>9:30</td>
<td>Van</td>
<td>East</td>
<td>9</td>
<td>Miscellaneous</td>
<td>3077</td>
<td>Environmentally Hazardous Substance</td>
<td>171</td>
<td></td>
</tr>
<tr>
<td>9:37</td>
<td>MC331</td>
<td>West</td>
<td>2.1</td>
<td>Flammable Gas</td>
<td>1075</td>
<td>Propane</td>
<td>115</td>
<td>41,200</td>
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<tr>
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<td>MC306</td>
<td>West</td>
<td>3</td>
<td>Flammable Liquid</td>
<td>1863</td>
<td>Fuel, aviation, turbine engine</td>
<td>128</td>
<td>63,000</td>
</tr>
<tr>
<td>9:44</td>
<td>MC312</td>
<td>East</td>
<td>8</td>
<td>Corrosive</td>
<td>1791</td>
<td>Hypochlorite solution</td>
<td>154</td>
<td>45,850</td>
</tr>
<tr>
<td>9:45</td>
<td>MC306</td>
<td>East</td>
<td>3</td>
<td>Flammable Liquid</td>
<td>1203</td>
<td>Gasoline</td>
<td>128</td>
<td>54,000</td>
</tr>
<tr>
<td>9:50</td>
<td>Van</td>
<td>West</td>
<td>3</td>
<td>Flammable Liquid</td>
<td>1263</td>
<td>Paint (flammable)</td>
<td>128</td>
<td>2,300</td>
</tr>
<tr>
<td>9:55</td>
<td>Van</td>
<td>East</td>
<td>4.1</td>
<td>Flammable Solid</td>
<td>3175</td>
<td>Solids containing flammable liquid, NOS</td>
<td>133</td>
<td></td>
</tr>
<tr>
<td>10:00</td>
<td>MC306</td>
<td>West</td>
<td>3</td>
<td>Flammable Liquid</td>
<td>1203</td>
<td>Gasoline</td>
<td>128</td>
<td>54,000</td>
</tr>
<tr>
<td>10:05</td>
<td>Van</td>
<td>West</td>
<td>8</td>
<td>Corrosive</td>
<td>2817</td>
<td>Ammonium hydrogen difluoride, solution</td>
<td>154</td>
<td>172</td>
</tr>
<tr>
<td>10:05</td>
<td>Van</td>
<td>West</td>
<td>6.1</td>
<td>Toxic</td>
<td>2810</td>
<td>Toxic Liquid, NOS</td>
<td>153</td>
<td>520</td>
</tr>
<tr>
<td>10:15</td>
<td>Van</td>
<td>West</td>
<td>8</td>
<td>Corrosive</td>
<td>3260</td>
<td>Corrosive, solid, acidic, inorganic, NOS</td>
<td>154</td>
<td></td>
</tr>
<tr>
<td>10:30</td>
<td>MC406</td>
<td>East</td>
<td>3</td>
<td>Flammable Liquid</td>
<td>1203</td>
<td>Gasoline</td>
<td>128</td>
<td>54,000</td>
</tr>
<tr>
<td>10:35</td>
<td>Van</td>
<td>West</td>
<td>8</td>
<td>Corrosive</td>
<td>2794</td>
<td>Batteries, wet, filled with acid</td>
<td>154</td>
<td>3,570</td>
</tr>
<tr>
<td>10:35</td>
<td>Van</td>
<td>West</td>
<td>3</td>
<td>Flammable Liquid</td>
<td>1993</td>
<td>Flammable liquid, NOS</td>
<td>128</td>
<td>500</td>
</tr>
<tr>
<td>10:35</td>
<td>Van</td>
<td>West</td>
<td>9</td>
<td>Miscellaneous</td>
<td>3268</td>
<td>Air bag modules</td>
<td>171</td>
<td>51</td>
</tr>
<tr>
<td>10:45</td>
<td>Van</td>
<td>West</td>
<td>3</td>
<td>Flammable Liquid</td>
<td>1993</td>
<td>Flammable liquid, NOS</td>
<td>128</td>
<td>8,000</td>
</tr>
<tr>
<td>10:46</td>
<td>Van</td>
<td>West</td>
<td>8</td>
<td>Corrosive</td>
<td>3266</td>
<td>Corrosive liquid, basic, inorganic, NOS</td>
<td>154</td>
<td></td>
</tr>
</tbody>
</table>
EM Office of Transportation

Director
- Dennis Ashworth 202-586-8548
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