Commodity Flow Survey
PATRAM 2010
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London, U.K.

William F. Spurgeon
United States Department of Energy
Office of Environmental Management
Office of Packaging and Transportation
301-903-8187
william.spurgeon@em.doe.gov
COMMODITY FLOW SURVEY
- BACKGROUND -

- The U.S Department of Energy (DOE) makes 10,000 - 20,000 shipments per year of radioactive and hazardous materials by commercial carrier

- DOE’s Office of Packaging and Transportation is accountable for the safety and security of its shipments

- This office performs DOE’s Stakeholder Outreach and Emergency Preparedness mission for Transportation

- In cooperation with our stakeholders, we have performed seven 24-Hour Commodity Flow Surveys along Interstate Highways and surveyed over 55,000 commercial vehicles
COMMODITY FLOW SURVEY
- PLANNING -

DEVELOPMENT OF SURVEY PLAN

- Location, Date, and Duration
- Personnel Staffing Requirements
- Safety Considerations
  - Safe Area for Survey
  - Establish Safety Rules
  - Night Lighting and Signage
- Survey Team Needs
  - Shelter from Weather
  - Reflective Clothing
  - Sun Protection
  - Water and Snacks
  - Restroom Facilities
- Data Collection
  - Guidance for Collecting Data
  - Data Sheets and Logbook
  - Training Materials

Environmental Management
- safety • performance • cleanup • closure

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PROVIDE SURVEY TEAM TRAINING

- Schedule Survey Team Meeting
  Full Team (12-24 Persons)
- Provide Training Materials and Instruction
  Survey Objectives – Data Quality
  Safety Rules
  Vehicle Identification
  Shipping Paper Familiarization
  Survey Forms
  Rules for Data Entry
COMMODITY FLOW SURVEY
- THE SURVEY -

CONDUCT of SURVEY

- Survey Team Ready
  Data Sheets in Hand
- Begin at the Appointed Time
- Query Driver and Record Data
- Thank Driver and Release Vehicle
- Repeat the Cycle

- Enter data sheets in Logbook at end of shift
- Keep traffic flowing smoothly; Use discretion; Be prepared to deploy second team if traffic warrants
<table>
<thead>
<tr>
<th>#</th>
<th>Time</th>
<th>Trailer Type</th>
<th>Placard Number</th>
<th>Material ID#</th>
<th>Origin/ Destination</th>
<th>Hazmat Load</th>
<th>Hazmat Load Notes</th>
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<tr>
<td>1</td>
<td>09:00</td>
<td>Van</td>
<td>8</td>
<td>1791</td>
<td>Rock Hill, SC</td>
<td>Hypochlorite Solution, 18%</td>
<td>2,000 lbs</td>
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<td></td>
<td></td>
<td></td>
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<td>Sylva, NC</td>
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<tr>
<td>2</td>
<td>09:02</td>
<td>Double Van</td>
<td>3</td>
<td>1133</td>
<td>Richmond, VA</td>
<td>Adhesives</td>
<td>1418 lbs</td>
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<td>Methyl ethyl ketone</td>
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<td>Wet Batteries</td>
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<td>1073</td>
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<td>Oxygen</td>
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<td>Kansasville, TN</td>
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<td>6</td>
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<td>MC 307</td>
<td>9</td>
<td>3082</td>
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<td>Methylene diphenyl diisocyanate</td>
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<td>MC 312</td>
<td>3</td>
<td>1219</td>
<td>Hampton, VA</td>
<td>Isopropanol</td>
<td>19,980 lbs</td>
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<tr>
<td>8</td>
<td>15:58</td>
<td>MC 307</td>
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<td>3257</td>
<td>Asheville, NC</td>
<td>Asphalt</td>
<td>Empty</td>
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<td>Canton, NC</td>
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COMMODITY FLOW SURVEY
- THE SURVEY REPORT -

THE CFS REPORT

- Documents the Survey Data Taken
  Survey Data Table
- Performs Data Analysis
- Displays Findings
  Tables and Charts
- Presents Conclusions Drawn from
  Findings
- Examines Special Conditions
  Intersecting Highway Flow
  Predominant Commodities
<table>
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<tr>
<th>Time</th>
<th>Dir.</th>
<th>Trailer Type</th>
<th>Origin/ Destination</th>
<th>Trailer Placard</th>
<th>Material Hazard Class</th>
<th>Mat'l ID</th>
<th>Material PSN</th>
<th>Material Name</th>
<th>ERG Guide Number</th>
<th>Quantity (lbs)</th>
<th>Other</th>
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<td>East</td>
<td>MC306</td>
<td>MD-MD</td>
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<td>1203</td>
<td>Combustible liquid, NOS</td>
<td>Heating Oil</td>
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<td>3 Flammable Liquid</td>
<td>1203</td>
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<td>2794</td>
<td>Batteries, wet, filled with acid</td>
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<td>Tube Trailer</td>
<td>MD-DE</td>
<td>2.2 Nonflammable Gas</td>
<td>1204</td>
<td>Helium, compressed</td>
<td>Helium</td>
<td>121</td>
<td>12 Tubes - partial load -half</td>
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<td>Gasoline</td>
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<td>7553 gal</td>
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<td>Radioactive material, NOS</td>
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<td>163</td>
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<td>9 Miscellaneous</td>
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<td>Asphalt</td>
<td>128</td>
<td>0</td>
<td>Coating</td>
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<td>8 Corrosive</td>
<td>1751</td>
<td>Corrosive solid, NOS</td>
<td>Corrosive Solids</td>
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<td>Van</td>
<td>MD-MI</td>
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<td>Hazardous waste, solid, NOS</td>
<td>Arsenic Trioxide waste</td>
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<td>163</td>
<td>10,000</td>
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Chart 2 - Placard Count

Hazard Classification

Class 1 - Explosives
Class 2 - Gases
  2.1 Flammable Gases
  2.2 Nonflammable Gases
  2.3 Toxic Gases
Class 3 - Flammable Liquids
Class 4 - Flammable Solids
  4.1 Flammable Solids
  4.2 Spontaneously Combustible Materials
  4.3 Water Reactive Substances
Class 5 - Oxidizing Substances and Organic Peroxides
Class 6 - Toxic Substances and Infectious Substances
  6.1 Toxic Substances
  6.2 Infectious Substances
Class 7 - Radioactive Material
Class 8 - Corrosive Substances
Class 9 - Miscellaneous Hazardous Materials

Placard Number

<table>
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<tr>
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<th>3</th>
<th>8</th>
<th>9</th>
<th>2.2</th>
<th>2.1</th>
<th>5.1</th>
<th>6.1</th>
<th>7</th>
<th>4.1</th>
<th>2.3</th>
<th>4.2</th>
<th>1.3</th>
<th>1.4</th>
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<td>28</td>
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<td>5</td>
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COMMODITY FLOW SURVEY

Chart 5 - Top 25 Commodities by Count

Number of Shipments

Commodity

Paint, Elevated Temp Liquid, Jet Fuel, Gasoline, Asphalt, LPG, Oxygen, Sodium Hydroxide, Hydrochloric Acid, Diesel, Sulfuric Acid, Battery Fluid, Batteries, 1,1,1,2-Tetrafluoroethane, Formaldehyde, Corrosive, Corrosive Liquid, Petroleum Distillates, Phosphoric Acid, Adhesives, Flammable Liquid, Nitrogen, Lighters, Crude Oil, Fuel Oil, Potassium Hydroxide, Resins.
COMMODITY FLOW SURVEY

Chart 6 - Top 25 Commodities by Weight

Commodity

Pounds

Jet Fuel
Ethanol
Paint
Asphalt
Oxygen
LPG
Gasoline
Hydrochloric Acid
Sulfuric Acid
1,1,1-Trichloroethane
Sodium Hydroxide
Diesel
Nitrogen
Formaldehyde
Flammable Gas
Petroleum Distillates
Hazardous Waste
Battery Fluid
Ammonium Nitrate
Batteries
Calcium Hypochlorite
Cleaning Liquid
Isopropanol
Used Oil
Crude Oil