NTSB AIR CARGO SAFETY FORUM
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NTSB ACADEMY, ASHBURN, VA
IMPROVEMENTS IN AIR CARGO DANGEROUS GOODS SAFETY

Pat N. Oppenheimer
Manager,
Safety, Dangerous Goods and ADFWP
FedEx Express
Memphis, TN

Scott A. Mugno
Managing Director,
Corporate Safety, Health and Fire Prevention
FedEx Express
Memphis, TN

OVERVIEW

- Brief Overview of the FedEx Express Dangerous Goods (DG) Program
- September 1996; FedEx Flight 1406, Newburgh, New York
- Electronic DG Data Recording/Reporting; FedEx Express AutoDG Manifesting System
- September 2001; Program Enhancements and Developments
- Issues Impeding Efficient and Effective Improvements

BRIEF OVERVIEW OF THE FEDEX EXPRESS DG PROGRAM

Why Offer a Dangerous Goods Service?

- When prepared/handled correctly and safely, no more risk than any other package being transported
- Provides the full value and range of services to our customers
- Certain industries/industry segments are highly dependant on the service (no/few alternatives)
- Meets medical, health, community needs; public at large not necessarily aware of its need/dependence for DG transportation
- Discourage “underground/undeclared” shipments

BRIEF OVERVIEW OF THE FEDEX EXPRESS DG PROGRAM (cont.)

- Door to Door to Service within the USA, Canada, Europe, Japan and certain other parts of the world; Air Freight to Air Freight Forwarders
- Require Compliance with IATA/ICAO: virtually identical to Title 49 CFR
- FedEx Express Daily DG Volume is less than 1/3 of 1% of Overall Daily Package Volume
- Most Shipments are less than 70 lbs and 4 liters
- Many of the substances are obtainable at your local paint, hardware, grocery, homes center/store

BRIEF OVERVIEW OF THE FEDEX EXPRESS DG PROGRAM (cont.)

- **NOTE:** Our barcode/automated shipping and tracking systems alone strongly support the safe and secure transport of DG
- **NOTE:** Our facilities have limited/restrictive access and the length of time a package is at each conveyance point is limited
- DG accepted at customer and FedEx Express acceptance locations
- Couriers/Service Agents perform an inspection, input certain data, and load/manifests as required
- DG packages separated at the Station; inspected for compliance/acceptance; loaded accessible/inaccessible - containerized/non containerize by trained DG Specialists
- Transported to Ramp by trained properly licensed driver with DG manifests in the vehicle cab

BRIEF OVERVIEW OF THE FEDEX EXPRESS DG PROGRAM (cont.)

- At Ramp, DG Specialist loads accessible container, containers loaded on aircraft, DG Specialist prepares and presents DG documents for Flight Crew review
- At Hub, accessible DG sorted, inspected, and reloaded by a DG Specialist; Secondary DG packages loaded with other cargo and audited by DG Specialist
- Containers loaded on the aircraft and DG Specialist prepares and presents DG documents for Flight Crew review
- Same process in reverse from Hub, Ramp, Station, to destination
- **NOTE:** Again, barcode scanning strongly supports this transport and, now, the AutoDG system at each change in location/conveyance

BRIEF OVERVIEW OF THE FEDEX EXPRESS DG PROGRAM (cont.)

- Couriers, Handlers, and Customer Service Agents receive initial and annual awareness and handling training
- DG Specialists receive 40 hour initial training and annual recurrent training
- CDL/Haz Endorsement authorized for Placarded loads; for FedEx Express - Yellow III, Class 4.3, combined loads exceeding 1000 lbs; **NOTE:** Placarded loads add no more risk than the fuel/fuel tank powering the vehicle
- 24/7 support from DG Administration group consisting of 9 professionals w/over 100 years combined experience
- DG Administration supported by over 40 field Safety Specialists, Radiation Health Physicist, 24 Instructors, a DG Hotline for customers and employees and numerous on-line and conventional communications

SEPTEMBER 1996; FEDEX FLT 1406, NEWBURGH, NY

- Earlier that year – ValueJet Miami/Everglades Crash and TWA 800 off Long Island, NY
- September 1996, FedEx Flt 1406 made an emergency landing at Newburgh, NY
- With smoke originating in the rear of the aircraft, aircraft landed safely
- DG manifest summary provided by flight crew member to fire fighters; the summary was misplaced by fire fighters
- DG shipment detail took multiple attempts to successfully fax to the landing site location
- Cause of fire not attributable to known DG on-board

FEDEX EXPRESS HISTORY OF "ELECTRONIC" DG REPORTING

JULY 1998

- DG Summary Screen was added to the Weight& Balance (W&B) systems
- Data entered post-departure by position, class, and total quantity

SPRING 2001

- W&B systems are enhanced with additional DG edits (quantity limits for Dry Ice and RAM)

SUMMER 2001

- AutoDG mainframe application work begins

- (AutoDG Screen and Report Examples)

DG REGULATORY REQUIREMENTS

- FedEx Express always in compliance with the existing regulation
- ICAO/IATA imposed requirement to have ready access to DG data (2003)
- HM 206C requires same (fully implemented October 2004)

AUTODG PROJECT OVERVIEW

PHASE I – Add DG edits to W&B Systems

- Automated P-S-T checks implemented to prevent aircraft diversions
- Primary Responsibility: Ramp Agent
- Implemented 2001

PHASE II – Develop mainframe application

- Manual process to gather DG data, assign shipment to ULD, assign ULD to conveyance
- Primary Responsibility: DG Specialist
- Completion: September 2003

PHASE III – Develop real-time process to capture DG data

- Capture DG data from Customer Automation Devices (CADs); currently 70% of DG shipments on CADs)
- “Move” DG shipments through system with RF scans
- Primary Responsibility: DG Customer
- Estimated Completion: FY05

AUTODG SYSTEM OVERVIEW

FIVE MAJOR STEPS FOR MOVEMENT OF A DG SHIPMENT

- Step 1: SHIP – Enter shipment details from Shipper's Declaration
- Step 2: ASSIGN – Assign shipment to ULD or BULK
- Step 3: Close conveyance; Print ULD DG manifest

FOR TRUCKS

- Step 4: TRUCKQ – Assign closed conveyance to truck route
- Step 5: MANMEN – Print Truck DG Manifest

FOR AIRCRAFT, TRUNK and FEEDER

- Step 4: QUE – Assign closed conveyance to flight route
- Step5: PRINT or ACARS – Print A/C DG Manifest

- (AutoDG Screen and Report Examples)

SEPTEMBER 2001; PROGRAM ENCHANCEMENTS & DEVELOPMENTS

- September 11, 2001 Attacks
- Anthrax Attacks; FedEx Express “Suspicious Package” Initiative
- Anti Abortionist Hoax Incident
- Cargo Screening (Radiation Detection) Program
- Biological and Chemical Detection Program Research
- “Preparedness” Awareness and Policy Development
- Issues Impeding Efficient and Effective Improvements

SEPTEMBER 2001; PROGRAM ENCHANCEMENTS & DEVELOPMENTS

- September 11, 2001 Attacks; Successfully accounted for all our involved employees quickly and revised our operations swiftly to work around the grounded air fleet
- Anthrax attacks; Combined existing safety and security training, policy, and protocol to create “Suspicious Package” job aide and communications initiative
- Existing DG Spill/Undeclared package protocols worked well
- Anti Abortionist Hoax Incident; Using our tracking system, relationship with the customer/victim, and our communications system, stopped the deliveries in progress
- Lessons learned – the nature of our time-definite operations, its policies, practices and protocols, and contingency plans served us well

CARGO SCREENING PROGRAM

- FedEx Express has years of experience in radiation detection and Class 7 materials
- Digital handheld survey meters used at acceptance points and installed at Hubs for years
- Crew members and high volume location employees wear monitoring badges
- Several Capital Hill officials and U.S. Customs approached FedEx Express about concerns for the transportation of nuclear devices
- FedEx Express voluntarily launched an extensive research, development, pilot program and implemented a final program

CARGO SCREENING PROGRAM (cont.)

- The FedEx Express Cargo Screening Program enhances all U.S. inbound cargo screening
- Equipment includes:
  - Handheld Gamma and Neutron Detectors
  - Conveyor Belt Installed Plastic Scintillation Detectors
  - Freight Container Plastic Scintillation/Helium 3 Portal Detectors
  - Data log with Third Party Monitoring
- Program Equipment meets or exceeds new ANSI Standards

- (Cargo Screening Device and Installation Examples)

BIOLOGICAL & CHEMICAL DETECTION PROGRAM RESEARCH

- Again, FedEx Express has an extensive time & experienced tested DG Program and response protocol that continues to serve us well
- Biological/Chemical detection technology far behind radiation detection technology
- ISSUES INCLUDE:
  - No one-size-fits-all or ‘smoke detector’ type technology available
  - Device sensitivity, accuracy, and or ’false positives’
  - Most require separate device for each substance to be detected
  - ‘Real-time’ alarming/notification not real time/instant
  - Ease of training and or use varies
  - Cost prohibitive or restrictive
  - Operational impact significant
- One practical favorable fact here – these substances must be used/delivered in certain quantities, concentrations, and conditions to cause the intended harm

BIOLOGICAL & CHEMICAL DETECTION PROGRAM RESEARCH (cont.)

- Portable Gas Chromatograph /Mass Spectrometer (GC/MS)
- Chemical Agent Monitors
- Manual or ‘chemistry set’ labs-in-a-box
- Enhanced ’labs-in-a-box’ using digital cameras, laptops and internet
- Automated ’labs-in-a-box’ – PCR and DNA technologies combined
- Pressurized/Airtight air sample and trace detection analytical device
- Thin Film Resonator Sensor Chip Technology (w/RF)
- Polymer Composite Sensor Array Chip Technology (w/RF)
- Approach: Focus on key risks/threats identified and build a “defensive perimeter”

"PREPAREDNESS" AWARENESS AND POLICY DEVELOPMENT

- You, like us, already have many policies and practices in place that will work here; may not know it
- Additions or enhancements addressing issues specific to Homeland Security incidents are/may be all that is needed
- Awareness is important -if fear is the intent of terrorism, then knowledge is the defense; communicate facts without communicating fear
- Developing job aides for precautions in workplace, on road, in high rise building, general purpose; a wealth of information out there – fit it for your operation
- Updating plans and call lists and keeping multiple copies where they can be accessed important
- Emergency supply kits – the workplace following current regulatory compliance and having basic conveniences has 90% plus items in place; decide on the rest
- **The simple administrative actions most effective, efficient and available now!**

ISSUES IMPEDING EFFICIENT AND EFFECTIVE IMPROVEMENT

- Post September 11, 2001 efforts layered on existing DG issues/needed revisions (decades old requirements, constructive knowledge, etc…)
- Homeland Security Advisory System; Great tool, exactly what is it are we to do?
- Variety of political and various organizational pressures and posturing that further cloud a difficult issue
- The post September 11, 2001 “wave of regulation” – like never seen before

WAVE OF REGULATION

TITLE	DATE	ACTION
HM-189V	31 Dec 03	Final Rule
RSPA-03-16370	04 Dec 03	Proposed Rule
HM-223	04 Dec 03	Proposed Rule
HM-229	03 Dec 03	Final Rule
RSPA-03-16456	13 Nov 03	Notice
HM-223	30 Oct 03	Final Rule
HM-189V	06 Oct 03	Final Rule
HM-220D	26 Sep 03	Interim Final Rule
RSPA-00-7092	22 Sep 03	Decision on Preemption
HM-220F	10 Sep 03	Proposed Rule
RSPA-03-15372	08 Sep 03	Final Rule
HM-213	03 Sep 03	Final Rule
RSPA-03-14793	20 Aug 03	Notice
HM-21813	14Aug 03	Final Rule
HM-215E	31 Jul 03	Final Rule
RSPA-03-14793	30 Jul 03	Notice
RSPA-03-14793	25 Jun 03	Notice
HM-206B	11 Jun 03	Proposed Rule
RSPA-03-14793	10 Jun 03	Notice
RSPA-03-14982	09 Jun 03	Notice
HM-220D	02 Jun 03	Correction to Final Rule
HM-218A	30 May 03	Final Rule
HM-220D	08 May 03	Final Rule
FMCSA-01-11117	05 May 03	Interim Final Rule
TSA-03-14610	05 May 03	Interim Final Rule
HM-232C	05 May 03	Interim Final Rule
HM-213	18 Apr 03	Final Rule
HM-232	25 Mar 03	Final Rule
HM-206C	25 Mar 03	Final Rule
RSPA-03-14424	28 Feb 03	Interpretation
HM-213B	10 Feb 03	Proposed Rule
TSA-03-14421	06 Feb 03	Interim Final Rule
HM-218B	21 Jan 03	Proposed Rule

WAVE OF REGULATION (Con't)

TITLE	DATE	ACTION
HM-208D	09 Jan 03	Final Rule
HM-215E	08 Jan 03	Final Rule
RSPA-02-13481	12 Dec 02	Notice/Comment
HM-215E	03 Dec 02	Proposed Rule
HM-207B	01 Nov 02	Final Rule
HM-229	01 Nov 02	Proposed Rule
HM-220D	30 Sep 02	Final Rule
HM-189T	27 Sep 02	Final Rule
RSPA-00-7092	20 Sep 02	Decision on Preemption
HM-208E	16 Sep 02	Final Rule
HM-226	27 Aug 02	Correction to Final Rule
HM-226	14 Aug 02	Final Rule
HM-220D	08 Aug 02	Final Rule
HM-232A	16 Jul 02	Proposed Rule
HM-207B	12 Jul 02	Final Rule
RSPA-02-11270	08 Jul 02	Notice
RSPA-98-3974	28 Jun 02	Final Rule
RSPA-02-12064	23 May 02	Proposed Rule
FAA-02-05	13 May 02	Guidance
RSPA-99-6283	30 Apr 02	Proposed Rule
RSPA-00-7702	03 Apr 02	Final Rule
RSPA-02-11982	02 Apr 02	Proposed Rule
RSPA-00-8439	14 Mar 02	Proposed Rule
RSPA-02-11675	05 Mar 02	Final Rule
RSPA-02-11654	26 Feb 02	Proposed Rule
RSPA-01-10533	22 Feb 02	Proposed Rule
RSPA-02-11270	14 Feb 02	Notice
RSPA-98-3684	13 Feb 02	Proposed Rule
RSPA-00-7762	13 Feb 02	Proposed Rule
RSPA-98-3554	01 Feb 02	Proposed Rule
RSPA-01-10741	08 Jan 02	Denial of Petition
RSPA-98-3554	04 Dec 01	Proposed Rule

GOING FORWARD, ALL PARTIES INVOLVED MUST…

- Give full credit and acknowledgement – don't dismiss out of hand – what is in place and working simply because it is pre September 11, 2001 developed and implemented
- To balance the needs of commerce, business operations and security and safety, we need to use technologies that aren't available yet or are still in concept phase
- Use simple administrative actions; will carry the day while technology catches up
- Pursue/support government research, development and sound science
- Review/revise all existing requirements, laws and regulations before layering on more; are new requirements truly efficient and effective improvements?
- Do not allow the 'perfect' to be the enemy of the 'good' in this difficult arena

THANK YOU

THINK SAFETY, ACT SAFELY, BE SAFE