

**NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594**

Hazardous Materials Group Factual Report

January 5, 2001
DCA-00-MA-026

A. Incident Identification

Location: Rancho Cordova, CA
Date and Time: February 16, 2000; 7:51 p.m.
Hazardous Materials: Detonating fuzes, 1.4B (Class C explosive)
Injuries: 3 Fatalities
Carrier: Emery Worldwide Airlines
Shipper: OEA Aerospace, Inc.
Transportation Mode: Air

B. Group Members

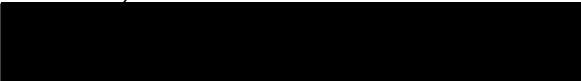
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C. The Accident

About 7:49 p.m. Pacific Standard Time (PST), on February 16, 2000, an Emery Worldwide Airlines, Inc., McDonnell Douglas DC-8-71F, registration N8079U departed Mather Airport, Sacramento, California. Shortly after takeoff, the flight declared an emergency. At 7:51 p.m., the airplane crashed into an automobile salvage yard east of the airport in Rancho Cordova, California. The airplane was consumed in the post-crash fire. All three crewmembers on board were fatally injured.

D. Hazardous Materials Information

A package containing 16 detonating fuzes was carried as cargo on the airplane. These detonating fuzes were classified as a Department of Transportation (DOT) 1.4B (Class C explosive). Each detonating fuze contains a long thin strip of the explosive hexanitrostilbene (HNS). The strip is approximately 1/10th inch wide by 6 foot long and contains 2.19 grams of HNS. According to the manufacturer, OEA Aerospace, Inc., Fairfield, CA, test results indicate that HNS will burn and not detonate, when exposed to a fire. An explosive initiator, not shipped with the fuze, is required to detonate the material. A detonating fuze is installed in the cockpit window frame of the Apache helicopter and used to break the window to allow pilot evacuation during an emergency. (Appendix A)

This type of detonating fuze was tested in accordance with 49 CFR, Part 173.56 as a new explosive,¹ classed as a 1.4B (detonating fuze),² and was issued a DOT Explosives Approval number EX 9405016, on May 5, 1994. (Appendix B)

According to the cargo manifest, no other declared hazardous materials were in the cargo of the airplane. The investigators contacted the other cargo shippers to determine if any undeclared hazardous materials were on board the airplane. The information obtained did not indicate that undeclared hazardous materials were in the cargo of the airplane. The Defense Distribution Depot San Joaquin, Tracy, CA, was identified as the shipper of several 55-gallon drums and pails found in the wreckage. Information provided by the depot indicated that the products in the drums and pails were not hazardous materials, as defined by the DOT. The drums and pails contained engine lubricating oil, and hydraulic fluid.

Location of Hazardous Material on Airplane.—The package containing the detonating fuzes was loaded in compartment 1, the forward, starboard compartment on the airplane. (Appendix F)

E. Hazardous Materials Packaging Information

Each of the 16 detonating fuzes was mounted on cardboard using plastic zip ties. Each was then placed in a "pink poly" (a non-sparking polymer) sealed pouch. The 16 pouches were placed inside a 36" x 36" x 12" UN specification 4D plywood box.³ The pouches were placed in two

¹ "A new explosive means an explosive produced by a person who: (1) has not previously produced that explosive; or (2) has made a change in formulation, design or process so as to alter the properties of the explosive." [49 CFR 173.56(a)]

² Explosive classification codes range from 1.1A (Primary explosive substance) to 1.4G (Pyrotechnic substance or article containing a pyrotechnic substance...).

³ The boxes typically used are marked "4D/Y6B/S/99/+AS0327."

stacks of 8 each inside the box with packing material between the layers. The total weight of the package was 70 lbs. The total weight of explosives in the package was 35.04 grams⁴ (16 x 2.19 grams).

Damage to Materials and Packaging.—The plywood box containing the fuzes was burned. Only two or three pieces of plywood were recovered. The largest piece (18" x 12") was burned around the periphery. Portions of 12 of the 16 detonating fuzes were recovered. They were still mounted on cardboard inside their plastic pouches. Portions of each fuze, cardboard and pouch were destroyed in the fire. (Appendix L)

F. Shipment Information

The detonating fuze was manufactured and offered to Emery by OEA Aerospace, Inc. It was destined for Sikorsky Aircraft, Jupiter, FL. The Declaration for Dangerous Goods tendered by OEA AEROSPACE, INC., on February 16, 2000, listed the following description:

<i>PSN</i>	<i>Class</i>	<i>UN#</i>	<i>PG</i>	<i>Qty / Type</i>	<i>PI</i>	<i>Authorization</i>
Fuzes, detonating	1.4B	UN0257	II	1 Plywood Box x .0009kg	141	CA-EX 945016

(Appendices A&F)

OEA Aerospace representatives were asked why the declaration showed the total weight of for the explosives contained in their shipment as 0.0009 Kg instead of 0.03504 Kg; they were unable to explain the discrepancy.

G. Emergency Response to Hazardous Materials

At 7:52 p.m., the first Sacramento fire response was dispatched. At 8:07 p.m., as a result of the fuel spill and fire, the incident was declared a Level 3 Haz Mat Response.⁵ Emery Maintenance Control, in Dayton, OH, received information on the explosives from Emery's Sacramento personnel at 8:15 p.m. About the same time, Emery's Sacramento personnel also provided the information on the explosives to Sacramento County emergency response on the scene. Haz Mat duty officer for Sacramento County was notified of the accident at 8:18 p.m. and responded to the site. About 9:15 p.m., the duty officer was told by Sacramento County fire fighters that low-level explosives were carried as cargo on board the airplane. (Appendix F&H)

⁴ 0.03504 kilograms

⁵ Response levels are from 1 to 3 with 3 being the most severe.

H. Federal Hazardous Material Requirements for Explosives

Title 49 Code of Federal Regulations (49 CFR), Part 172.101 (Hazardous Materials Table) list the following information for fuzes, detonating, UN0257.

Proper Shipping Name: Fuzes, detonating

Class: 1.4B

Packing Group: II

Label: 1.4B, Cargo Aircraft Only

Special Provision: 116

Packaging: 173.62, Non-Bulk

Packing Instruction: 141

Quantity Limitations: Passenger Aircraft/Rail FORBIDDEN

Cargo Aircraft 75kg maximum per package

49 CFR Section 172.101 Special Provision number 116 states:

Fuzes, detonating may be classed in Division 1.4 if the fuzes do not contain more than 25g of explosive per fuze and are made and packaged so that they will not cause functioning of other fuzes, explosives or other explosive devices if one of the fuzes detonates in a shipping packaging or in adjacent packages.

49 CFR, Part 173.51, states that no person may offer for transportation or transport an explosive, unless it has been tested, classed and approved in accordance with 49 CFR, Part 173.56.

49 CFR Part 173.62, Specific Packaging Requirements for Explosives, assigns Packing Instruction 141 to UN0257. This packing instruction allows for the use of plastic receptacles⁶ as one of the authorized inner packagings, and a 4D plywood box as one of the authorized outer packagings. (Appendix J)

I. Carrier - Hazardous Materials Information

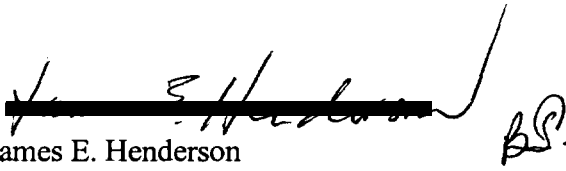
Emery Worldwide Airlines headquarters is in Vandalia, Ohio, and its main hub is in Dayton, Ohio. It has 41 airplanes dedicated to transporting cargo. On average, Emery carries about 1.1 billion pounds of freight per year. Emery estimated that they carried about 23.7 million pounds of hazardous materials, or about 2 percent of the total freight by weight, in 1998 and about 53.3 million pounds, or about 5 percent of the total freight by weight, in 1999. (Appendix F)

⁶ Receptacle is defined by DOT as "a containment vessel for receiving and holding materials, including any means of closing." (49 CFR 171.8)

LIST OF APPENDICES

- A. Information Provided by OEA Aerospace, Inc.
- B. Information Provided by RSPA
- C. Shipping Documents from Reno
- D. Shipping Documents from Mather
- E. Emery Emergency Response Information
- F. Misc. Information Provided by Emery
- G. Information on Defense Distribution Depot San Joaquin Shipment
- H. Information Provided by Sacramento County
- I. Observation Report on Drums from Defense Distribution Depot San Joaquin
- J. Information Provided by the FAA
- K. Interview Notes
- L. Photographs

Procedures for Handling Incidents/Accidents—Before each takeoff, Emery's flight crew is provided with copies of the shipper's declaration of dangerous goods shipment, an acceptance checklist, and an aircraft load plan for dangerous goods. Each airplane also has a copy of the International Civil Aviation Organization's (ICAO) *Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods* that provides the flight crew with instructions for responding to hazardous materials emergencies during the flight. Further, information concerning the class, weight, and location of hazardous materials on each flight is sent electronically to Emery's network control in Dayton, Ohio. Emery's network control is manned 24 hours a day, 365 days a year, and can provide basic hazardous materials emergency response information for each of their flights should an accident occur. Emery's network control can also obtain and provide more detailed information on the hazardous materials shipments by contacting the flight's originating terminal where copies of the shipping documents are maintained. (Appendix E)


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Hazardous Materials Group Chairman