

#### 4. RECOMMENDATIONS

As a result of the investigation of this accident, the National Transportation Safety Board made the following recommendations:

—to the Federal Aviation Administration:

Expedite final rulemaking to require smoke detection and fire suppression systems for all class D cargo compartments. (A-97-56)

Specify, in air carrier operations master minimum equipment lists, that the cockpit-cabin portion of the service interphone system is required to be operating before an airplane can be dispatched. (A-97-57)

Issue guidance to air carrier pilots about the need to don oxygen masks and smoke goggles at the first indication of a possible in-flight smoke or fire emergency. (A-97-58)

Establish a performance standard for the rapid donning of smoke goggles; then ensure that all air carriers meet this standard through improved smoke goggle equipment, improved flightcrew training, or both. (A-97-59)

Require that the smoke goggles currently approved for use by the flightcrews of transport-category aircraft be packaged in such a way that they can be easily opened by the flightcrew. (A-97-60)

Evaluate the cockpit emergency vision technology and take action as appropriate. (A-97-61)

Evaluate and support appropriate research, including the National Aeronautics and Space Administration research program, to develop technologies and methods for enhancing passenger respiratory protection from toxic atmospheres that result from in-flight and post-crash fires involving transport-category airplanes. (A-97-62)

Evaluate the usefulness and effectiveness of the Douglas DC-9 procedures involving the partial opening of cabin doors and similar procedures adopted by some operators of other transport-category airplanes for evacuating cabin smoke or fumes and, based on that evaluation, determine whether these or other procedures should be included in all manufacturers' airplane flight manuals and air carrier operating manuals. (A-97-63)

Require airplane manufacturers to amend company maintenance manuals for airplanes that use chemical oxygen generators to indicate that generators that have exceeded their service life should not be transported unless they have been actuated and their oxidizer core has been depleted. (A-97-64)

Require that routine work cards used during maintenance of Part 121 aircraft (a) provide, for those work cards that call for the removal of any component containing hazardous materials, instructions for disposal of the hazardous materials or a direct reference to the maintenance manual provision containing those instructions and (b) include an inspector's signature block on any work card that calls for handling a component containing hazardous materials. (A-97-65)

Require manufacturers to affix a warning label to chemical oxygen generators to effectively communicate the dangers posed by unexpended generators and to communicate that unexpended generators are hazardous materials; then require that aircraft manufacturers instruct all operators of aircraft using chemical oxygen generators of the need to verify the presence of (or affix) such labels on chemical oxygen generators currently in their possession. (A-97-66)

Require all air carriers to develop and implement programs to ensure that other aircraft components that are hazardous are properly identified and that effective procedures are established to safely handle those components after they are removed from aircraft. (A-97-67)

Evaluate and enhance its oversight techniques to more effectively identify and address improper maintenance activities, especially false entries. (A-97-68)

Review the adequacy of current industry practice and, if warranted, require that Part 121 air carriers and Part 145 repair facilities performing maintenance for air carriers develop and implement a system requiring items delivered to shipping and receiving and stores areas of the facility to be properly identified and classified as hazardous or non-hazardous, and procedures for tracking the handling and disposition of hazardous materials. (A-97-69)

Include, in its development and approval of air carrier maintenance procedures and programs, explicit consideration of human factors issues, including training, procedures development, redundancy, supervision, and the work environment, to improve the performance of personnel and their adherence to procedures. (A-97-70)

Review the issue of personnel fatigue in aviation maintenance; then establish duty time limitations consistent with the current state of scientific knowledge for personnel who perform maintenance on air carrier aircraft. (A-97-71)

Issue guidance to air carriers on procedures for transporting hazardous aircraft components consistent with Research and Special Programs Administration requirements for the transportation of air carrier company materials; then require principal operations inspectors to review and amend, as necessary, air carrier manuals to ensure that air carrier procedures are consistent with this guidance. (A-97-72)

Require air carriers to ensure that maintenance facility personnel, including mechanics, shipping, receiving, and stores personnel, at air carrier-operated or subcontractor facilities, are provided initial and recurrent training in hazardous materials recognition, and in proper labeling, packaging, and shipment procedures with respect to the specific items of hazardous materials that are handled by the air carrier's maintenance functions. (A-97-73)

Ensure that Part 121 air carriers' maintenance functions receive the same level of Federal Aviation Administration surveillance, regardless of whether those functions are performed in house or by a contract maintenance facility. (A-97-74)

Review the volume and nature of the work requirements of principal maintenance inspectors assigned to Part 145 repair stations that perform maintenance for Part 121 air carriers, and ensure that these inspectors have adequate time and resources to perform surveillance. (A-97-75)

Develop, in cooperation with the U.S. Postal Service and the Air Transport Association, programs to educate passengers, shippers and postal customers about the dangers of transporting undeclared hazardous materials aboard aircraft and about the need to properly identify and package hazardous materials before offering them for air transportation. The programs should focus on passenger baggage, air cargo, and mail offered by U.S. Postal Service customers. (A-97-76)

Instruct principal operations inspectors to review their air carriers' procedures for manifesting passengers, including lap children, and ensure that those procedures result in a retrievable record of each passenger's name. (A-97-77)

—to the Research and Special Programs Administration:

Develop records for all approvals previously issued by the Bureau of Explosives and transferred to the Research and Special Programs Administration and ensure all records, including designs, testing, and packaging requirements are available to inspectors to help them determine that products transported under those approvals can be done safely and in accordance with the requirements of its approval. (A-97-78)

— to the U.S. Postal Service:

Develop, in cooperation with the Federal Aviation Administration and the Air Transport Association, programs to educate passengers, shippers and postal customers about the dangers of transporting undeclared hazardous materials aboard aircraft and about the need to properly identify and package hazardous materials before offering them for air transportation. The programs should focus on passenger baggage, air cargo, and mail offered by U.S. Postal Service customers. (A-97-79)

Develop a program for U.S. Postal Service employees to help them identify undeclared hazardous materials being offered for transportation. (A-97-80)

Continue to seek civil enforcement authority when undeclared hazardous materials shipments are identified in transportation. (A-97-81)

— to the Air Transport Association:

Develop, in cooperation with the U.S. Postal Service and the Federal Aviation Administration, programs to educate passengers, shippers and postal customers about the dangers of transporting undeclared hazardous materials aboard aircraft and about the need to properly identify and package hazardous materials before offering them for air transportation. The programs should focus on passenger baggage, air cargo, and mail offered by U.S. Postal Service customers. (A-97-82)

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