

# Transportation of hazardous material strategies



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When it comes to the transportation of hazardous material by plane normal procedures of safety do not apply. There are very specific sets of rules and regulations that must be adhered to in order to be licensed to transport by an airliner any material that is classified as hazardous. Why do we need regulations? After all, aren't regulations always a source of headache for most ethically ran properly maintained businesses? One would like to believe this, however, as planes come crashing down investigations can often times reveal negligence in the handling and transport of materials that cause cataclysmic devastation. In this paper we will explore what is classified as a hazardous material and then we will slide right into who regulates transportation and how transportation of these materials is regulated.

What is classified as a hazardous material? Any material that can be labeled radioactive, allergenic, poisonous, a biohazard, corrosive, toxic, asphyxiating (lack of oxygen to the brain), explosive, oxidizing, flammable, pathogenic (dangerous living organism usually a virus), or magnetic can be classified as a hazardous material and requires a highly trained professional to handle and transport for the safety of all those in close proximity to the material. Wait? Did I say magnetic? Yes. Magnetism inside an aircraft other than normal currents can adversely influence an aircrafts sensitive computer systems, gauges, and mechanical systems. This could cause the plane to fly in circles or, worst case scenario, cause a serious malfunction that would ultimately conclude with a fiery ball of flames and the demise of the flight crew and, quite possibly, other fatalities and casualties. Many materials fall into more than one of these categories. Poisonous and asphyxiation for example could be listed on a material that poisons the body and as a result

asphyxiates the poor soul. But who has the authority to classify materials as such listed here?

The Department of Transportation was established by an act of Congress on October 15, 1966. It began operations on April 1, 1967. It is the purpose of the DOT to guarantee “ a fast, safe, efficient, accessible and convenient transportation system that meets our vital interests and enhances the quality of life of the American people, today and into the future (DOT 1966).” Inside the borders of the USA it is the DOT who regulate and enforce all laws that govern transportation in even its simplest form, walking. In respect to air transport of hazardous material they have a strict set of guidelines that must be adhered to that ensures they meet their motto. In later paragraphs in this essay we will examine a few of those guidelines. The Department of Transportation mandates that all employees who handle hazardous material will be required to participate in a training class that will entitle them at the end to receive a license to handle hazardous material. Outside the borders of the USA each country has its own department that regulates transport but each country has to adhere to the guidelines of both International Civil Aviation Organization (ICAO) and International Air Transport Association (IATA). If a country utilizes air transportation to deliver any hazardous chemical or material to another country then it has to abide by a strict set of guidelines set forth by ICAO and IATA. However, if an American business wants to move materials considered hazardous as described above then it will adhere to the guidelines of the DOT.

As stated by DOT 49 “ Sec. 175. 79 Orientation of cargo. (a) A package containing hazardous materials marked “ THIS SIDE UP” or “ THIS END UP”,  
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or with arrows to indicate the proper orientation of the package, must be stored and loaded aboard an aircraft in accordance with such markings. (b) A package containing liquid hazardous materials not marked as indicated in paragraph (a) of this section, must be stored and loaded with closures up (other than side closures in addition to top closures).” This means that if a box or container arrow pointing in any direction - up, down left or right - the container must be stood up or laid down according to the arrows. This is called material orientation. If the box says this end up then that end must be at the top. If a box is laid on its side when it should be standing up as indicated by the arrows and a hazardous material is contained inside the consequences of this error could be devastating. An example of a devastating consequence can be identified by the wreck of cargo jet shortly after taking off, killing three crew members and disintegrating the aircraft. The accident was due in part by a leaking container in the aft cargo hold. Zimbabwe is not governed by the Dept of Transportation so their rules and regulations for cargo transportation are slightly different from the United States. Apparently, a chemical leaked onto some of the important electrical wiring and sent the plane hurtling into the ground due to electrical failure. The rules and regulations set forth by the Dept of Transportation are designed to keep pilots, co-pilots, all personnel, whether they are on land or in the air, and innocent civilians safe from tragedies such as this. In the United States it is estimated that one cargo plane carrying a hazardous material will either be forced to land or will crash due to deviation from the rules and regulations set forth by the Dept of Transportation. Material orientation is easy compared to securing hazardous material.

Looking at a container and identifying its orientation is the easy part. When securing hazardous material it must be secured properly as to make no forward, backward, or sideways movements. If the hazardous material moves even in an inch it is no longer in compliance with is Title 49 Section 175. 81 which states, “ packages containing hazardous material must be secured in an aircraft in a manner that will prevent any movement in flight which would result in damage two or change in the orientation of the packages.” If a transportation agency is found to be in noncompliance the Dept of Transportation can fine the agency or can temporarily suspend or permanently revoke the agency’s license to haul hazardous material. If the noncompliance resulted in damage to hazardous material containers the hazardous material will be thoroughly inspected for damage and or leaks after being unloaded from the aircraft.

According to Title 49 Section 175. 90 part B in the case of a package which is leaking the employee must ensure that the remaining packages in the delivery do not have leaks or contamination. According to part C of the same title the package identified as being damaged or contaminated will not be placed aboard an aircraft for further transport. Hypothetically, you are carrying a material that has a label saying, “ dangerous when wet,” and the plane is also carrying barrels of water to the same destination you do not want the material marked “ dangerous when wet” to come into contact with the barrels of water. Most likely, they plane will not be carrying both materials as a precaution however not all countries abide by American regulations and common sense. When the pilot performs an inspection of his cargo and finds a damaged container he will immediately remove the

container according to regulations for the removal of hazardous material and he will ensure the rest of the shipment is unharmed. He will not risk the safety of his passengers and personnel by placing the damaged container back on board the aircraft. If the Dept of Transportation receives evidence that he has done so the pilot will have his license revoked and his wings stripped. He may even be slapped with a fine as determined by the offense. The rules and regulations set forth by the Dept of Transportation for the transportation of hazardous material are designed with safety in mind.

Many organizations believe that these rules and regulations are way too restrictive. Even so, many companies may actually lose money while trying to adhere to these rules and regulations. The necessity of rules and regulations such as these were designed to protect society from plane wrecks, explosions, system disorientation, birth defects caused by radiation, fatalities and casualties, chemical spills, radiation poisoning, poisonous gas plants causing asphyxiation, etc. The Dept of Transportation is not sympathetic to a company losing money trying to adhere to these regulations. The Dept of Transportation is a committee designed to protect society from the mission Giddings of bad business in transportation. It is their sole duty to uphold safety, efficiency, speed, reliability, convenience, and accessibility of all transportation. Any organization found to be in noncompliance with the rules and regulations of the Dept of Transportation can be fined or terminated by the department for noncompliance. There are many rules and regulations set forth by the Dept of Transportation for the transportation of hazardous materials that I have not covered but these are

the basics. It is, in the United States, the Dept of Transportation and regulates all transportation. Internationally, it is ICAO and IATA.