



FLIGHT SAFETY FOUNDATION

# Airport Operations

Vol. 14 No. 5

September/October 1988

## Safety Considerations In The Airport Environment

*Taking preventive action to organize ramp operations will save any airport operation money and from a potentially dangerous accident. The author offers an orderly plan to implement in any environment to improve ground handling.*

—  
by

A.W. "Tony" Brunetti

FSF membership surveys show that, in the category of ramp safety, two major problems are aircraft damaged by ground vehicles and the handling of hazardous materials.

The U.S. National Safety Council (NSC) once estimated that \$140 million (U.S.) are wasted annually in the United States from aircraft collisions involving service vehicles, other aircraft and fixed objects. The problem became so acute that the NSC introduced a "Defensive Driving Course" for ramp vehicle operators.

The major threat to be guarded against during ramp activities is damage inflicted on aircraft by vehicles, usually company owned.

### Small Incidents Can Have Serious Damage Potential

The most serious damage could be what appears to be relatively minor damage that is not reported. Even a slight skin scrape on a pressurized airplane can produce catastrophic results, if, as a consequence, an explosive decompression is experienced at altitude.

Other examples are damage to flight control systems, interior cables and exterior surfaces. Unless detected during pre-flight inspections, the results of such damage could be disastrous. For this reason, many aircraft operators have a standing rule — usually accepted by trade unions — that failure to report aircraft damage is grounds for dismissal.

### Damage Caused by Forklifts

Forklifts, the industry's popular "beast of burden," have inflicted a tremendous amount of damage on aircraft. Many operators have found it necessary to forbid the approach of forklifts to within six feet of an aircraft.

Some military organizations use a "circle of safety," which creates a sterile zone around the aircraft into which **no** motorized equipment may enter. Another worthwhile rule is to prohibit any vehicle from passing beneath an aircraft's fuselage or wings. The only exception is for refueling, subject to assistance from guidemen.

A few operators have used physical barriers positioned in areas of high collision potential around the aircraft. The barriers — wooden guards, weighted barrels — are not popular with the people who must place them and work around them, but they have been effective in reducing damage.

### Focusing on a Complex Problem

The problem is complex. In a typical routine airline servicing operation, there are catering and cabin service trucks, tugs, fuel trucks, baggage trains, air-start trucks, mail carts, lavatory trucks, loading vehicles and maintenance equipment — all bustling around the airplane, all working within a rigid time frame.

There is also additional vehicle and pedestrian traffic — all

this in an area frequently congested by moving and parked equipment. It is a wonder that there are not more accidents.

Obviously, to stand any chance of success, a number of factors are critical, including operator skill, vehicle condition, an orderly plan, adherence to rules and procedures — and lots of luck.

One airline, which has since compiled an enviable record in both ground and flight safety, had begun to experience an intolerable number of ramp accidents. It reacted typically, confining its actions to an investigation of each accident. Its management soon realized that all that had been accomplished was to eliminate the probability of repeating **that** mishap on **that** ramp by **the same** people.

In short, it learned that **communication** was vital to get the word to the rest of the employees so **all** could gain from the experience.

## Taking Preventive Action

Once this feedback was established, the carrier took some real **preventive** action, including:

- All ramp equipment was examined to ensure serviceability and that safety was part of its design;
- Explicit procedures were published for all ramp operations;
- All ramp equipment operators were retrained, qualified and licensed; and,
- Continuous supervision of vehicle operation was demanded by supervisors actually trained for the job.

Encouraged by the success of these basic steps, the airline made further refinements specifically designed to prevent aircraft damage:

- Flight-line vehicles were modified with telescopic extensions to eliminate the need for close approach to the aircraft;
- Forklifts were fitted with roller extensions to preclude fork-blade damage to aircraft;
- Marshals were assigned to direct movement of vehicles in the vicinity of aircraft; and,
- “Lookout” riders were put on certain service trucks. A buzzer alerted the driver when voice communication became blocked by ramp noise.

Although these refinements may seem exorbitant, an operator must ask himself: “Can I afford the accident?”

## Orderly Plan Needed

Examine what happens when basic factors for a safe operation are ignored, and there is no orderly plan. One would think that an airport ramp with miles of paved surface would be an easy place for vehicles to negotiate. It is not. Without order, such as designated vehicle routes, pedestrian paths and specifically marked equipment parking spots, it can become a **demolition derby**, not a safe ramp operation.

For example, leave one piece of equipment or any vehicle where it should not be (or where it is not expected to be), and it is only a matter of time before it will be hit.

Consider a classic two-vehicle accident that happened at a major U.S. airport. An empty fuel truck and a full lavatory-service truck collided almost head-on — in daylight, on an open taxiway that provided at least 300 feet of maneuvering room for either vehicle. Result: The lavatory truck was demolished, the fuel truck extensively damaged, and the injured operators were off work for two months. Why?

- There were no designated vehicle routes;
- Neither truck yielded to the other;
- One truck was speeding; and,
- Both operators were mentally asleep.

Vehicle condition is another area to be aware of. Many times after an accident investigations reveal problems such as bad brakes, sticking accelerators, defective steering, etc. For example, one employee drove a rental tug into a hangar, put the automatic shift lever in “PARK,” then left the vehicle. The accident report said the gear shift vibrated into reverse and that the tug backed into an aircraft, damaging its fuselage.

The operator claimed that that particular vehicle had a history of “jumping into gear.” If the vehicle did have problems, it should have been reported. More importantly, if the operator knew this he should have set the brakes and turned off the engine. The reasons he did not do this include:

- Poor operator discipline;
- Poor vehicle condition;
- Poor equipment inspection procedures; and,
- Poor supervision.

## Be Aware of Hazardous Materials

Explore the many threats of handling hazardous materials. While hazardous cargo presents a threat primarily to cargo handlers and flight crews, there are other materials routinely encountered in ramp work that could be troublesome to mechanics and other airport employees. For example, skin contact with jet fuel and de-icing fluids can be injurious. Breathing air heavily laced with carbon monoxide and burned hydrocarbons for eight hours is also very unhealthy.

The effects of the latter are obvious — burning eyes, coughing, headaches and sometimes nausea. Not as obvious is the threat now receiving serious attention in the United States — benzene exposure.

This type of exposure has been linked to leukemia. The U.S. Occupational Safety and Health Administration (OSHA) has written emergency standards limiting the exposure of workers to fuels and other fluids containing benzene.

On a less frequent basis, airport workers, primarily mechanics, face threats from such hazardous materials as cadmium fumes, epoxy resins and fiberglass particles. Cadmium, usually in the form of fumes generated in silver alloy brazing work, can be dangerous, attacking the heart, kidneys and other internal organs, and can be deadly in the most minute quantities.

Epoxy resins, while not nearly as lethal, can sensitize a person to the point where skin eruptions will occur if he or she is only in the presence of the fumes. Fiberglass particles are classified as a cancer causative agent, and exposure must be strictly controlled.

## Inspect New Materials

It is imperative that the materials an employee comes in contact with during the work day be examined to determine any possible hazard to his or her health and safety and what can be done to eliminate or lessen the hazard. Procedures also must be instituted to ensure that no new material is introduced without close scrutiny.

Of course, there are those businesses large enough to employ industrial hygienists and chemists, the staff to do the job properly. Those with full medical departments also are fortunate. But, for the small operator who is not as well-equipped, it is recommended that those employees who monitor the various aspects of work safety be charged with looking into this area.

For example, someone in maintenance/engineering or quality assurance should have a responsibility for controlling toxic substances and other hazardous materials procured for company use. This individual would be wise to meet with line maintenance, training and manuals control management personnel, as well as with the company nurse, to identify possible

problem areas and then to institute control procedures.

If there is reason to suspect a hazard, it is advisable to solicit professional assistance. Most insurance carriers employ (or have on call) consultants who have the proper training and testing equipment to do the job. This may be the most economical and safest approach to take.

## Know the Possible Alternatives

When a material has been identified as being hazardous, there are several alternatives. Normally, the fastest and simplest way to solve the problem is to substitute a less-hazardous material, if available. If not, contracting the particular job or process out to firms specializing in that work should be considered. Sometimes, of course, this is not feasible because of the cost and time delays encountered in contract work. In this event, an operator may be forced to work with the hazardous materials, and certain steps are a must:

- Engineering fixes should first be explored as a means of eliminating or limiting exposure to the hazard. For example, in the case of hazardous fumes, vented exhaust systems are effective;
- If engineering modifications are not feasible, or do not lower exposure to an acceptable limit, such exposure may be controlled by administrative procedures. For example, the actual time individual workers are allowed to work with the hazardous materials can be limited to decrease cumulative exposure; and,
- When these two steps have been instituted and proved to be inadequate, personal protective equipment must be used. Respirators are one example of such equipment in common use.

Whether any or all of these actions are taken, there are two other considerations that always apply. Personnel must be trained so that they recognize the hazard and know what is required of them to avoid it. Supervisors must **monitor the operation** for 100 percent compliance.

## Ideas to Start With

Experienced airport ramp operators realize this article has only scratched the surface. Obviously, a complete review of all of the hazards involved in ground handling and servicing aircraft and working with hazardous materials would require much more space than can be devoted to it here. But, some key hazard areas have been highlighted, and several ways that have been effective in coping with them have been considered. It is hoped that some of the suggested solutions may prove to be practical to your operation or, failing that, at least pique your interest in this vital area. ♦

# European Corporate Aviation Safety Seminar

Intercontinental Hotel  
Zurich, Switzerland

March 15, 1989

## “Safe Aircraft Operation In A Congested Air Traffic System”

For more information contact  
Bob Cooke, FSF

### **AIRPORT OPERATIONS**

**Copyright © 1988 FLIGHT SAFETY FOUNDATION, INC. ISSN 0898-574X**

Articles in this bulletin may be reprinted in whole or in part, but credit must be given to Flight Safety Foundation and *Airport Operations*. Please send two copies of reprinted material to the editor. The suggestions and opinions expressed in this bulletin are the authors and are not necessarily endorsed by the Flight Safety Foundation. Bulletin content is not intended to take the place of information in company policy handbooks and equipment manuals, or to supercede government regulations. Unsolicited manuscripts must be accompanied by stamped and addressed return envelopes if authors want material returned. Reasonable care will be taken in handling manuscripts, but the Flight Safety Foundation assumes no responsibility for material submitted. • Subscriptions : \$50 U.S. (U.S., Canada, Mexico), \$55 U.S. Air Mail (all other countries), six issues yearly. • Staff: Alisa Joaquin, editorial assistant; Jacqueline Edwards, word processor. • Request address changes by mail and include old and new addresses. • Roger Rozelle, editor, Flight Safety Foundation, 5510 Columbia Pike, Arlington, VA 22204-3194 U.S. Telephone: 703-820-2777 • Telex: 901176 FSF INC AGTN • Fax: 703-820-9399