



## Ramp Operations Hold Key to Overall Flight Safety Level

*Ramp operations may be mundane for some, but unsafe operations can lead quickly to tragedy and millions of dollars in losses.*

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by

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Safe ramp operation is the vital underpinning to safe flight. It is here that the airplane is prepared for flight.

After the pilot makes the decision to fly and accepts the airplane, it becomes his responsibility to complete the mission safely. It is important that the pilot not be burdened unknowingly with incomplete or improper service or maintenance actions that will compromise the crew's ability to safely manage the flight. Strong positive safety attitudes must be instilled in all aspects of ramp operation.

The airport ground environment is a dangerous place for the unwary.

Where else in the system is such a mixture of high-value equipment constantly exposed to ramp vehicles operated, in many cases, by unskilled and unsupervised employees? Where else are sophisticated, expensive machines maneuvered into crowded apron parking slots? Where else are such inconsistencies in ramp and taxiway lighting, signage and taxi lines found? Where else does one find dangers from flocking birds potentially choking a large engine inlet at the critical moment of takeoff? Where else are there such wide-ranging variances in attitudes toward snow removal and ice control? Where else does one find the potential for tragedy when an airplane is connected to the passenger lounge by a jetway, or when

an airplane crashes on or near an airport that has no disaster management plan or supporting community facilities to deal with injuries and fatalities?

Ramp safety issues may seem mundane to people accustomed to dealing with air traffic situations, new aircraft technology and crew training, but ramp accidents are a high-cost item for airlines and airports in personnel injuries and death, and in damage to equipment. One international airline reported an annual cost of US\$20 million per year in ground damage to aircraft.

As larger airliners with wingspans of 198 feet (60 meters) or more appear at civil airports, ramp safety becomes a bigger cost concern. One minor bump to an airliner's wing by a catering truck, caused by a driver's misjudgment, directly affects the airline's cash flow. That bump and the seemingly minor damage it involves will require the immediate removal of the aircraft from service for a thorough engineering inspection; passengers, cargo and mail must be off-loaded and placed on another flight; crew schedules will be thrown into disarray; aircraft scheduling and maintenance will be disrupted; connecting flights will be missed at airports along the way; flights that depended on that original airplane for their own scheduling may also have to be canceled; and inconvenienced passengers and shippers may convert their ire into a loss

of revenue for the airline.

The total cost of such a careless act by the driver will far outweigh the cost to repair the aircraft damage.

Airlines, insurance companies, manufacturers and regulatory authorities agree that accidents and incidents occurring daily on airport aprons are a serious problem.

A review of ramp operations suggests a lack of overall consistency in standards, operating practices and management. This may be understandable in view of how the air transport industry has grown, globalized and intensified, but it cannot be accepted as an excuse. Funding for airport modernization has seldom kept up with need, and the administration of the airport function varies considerably from country to country and even within some countries.

Following are examples of recent ramp conditions, accidents and incidents reported to the Flight Safety Foundation (FSF):

- Jetways are poorly lighted in many cases, resulting in slip-and-fall accidents among passengers, especially the elderly.
- Catering trucks often rely on rear-view mirrors for backing, with no outside walkers, even though the “cone of blindness” via mirrors may extend for as much as 150 feet (45 meters) for a 50-foot (15-meter) truck. The vehicle most often backs into the aircraft’s wing.
- Ground vehicles operated irresponsibly threaten moving aircraft. In one case, a wide-body aircraft taxied from the terminal to the runway, crossing an airport driveway. Just before crossing, the pilot saw a catering truck coming from the left without slowing in speed. The pilot applied full brakes, and the aircraft stopped in about 49.5 feet (15 meters). However, the truck maintained its speed and crashed into the aircraft near the nose wheel. Though there were no injuries, damage to the aircraft amounted to about \$5 million in addition to costs incurred by taking the aircraft out of service.
- An aircraft mechanic was sucked into the inlet of an engine at start-up. He managed to hold on to the inlet lip until co-workers were able to drag him away from the engine.
- In one of the former Soviet republics during the

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winter, passengers walked to a waiting aircraft on a ramp in about two inches of wet snow. The driver of an articulated passenger bus was enjoying the new snowfall by swerving the tug and “cracking the whip” with the passenger trailer. He continued this maneuver to within about 200 feet (60 meters) of the airplane. Other ramp service people and the company ground agent seemed to share his delight.

- The station manager of an international airline was concerned about foreign object damage (FOD) from debris on the parking apron and notified the host airport manager. The manager obliged promptly by bringing out a truck with two jet engines mounted for snow blowing. In a short time, all the debris had been cleaned from this airline’s parking apron, but blown onto the host country’s adjacent parking area and onto ramp and taxiways that had to be traversed by incoming and departing aircraft.
- Aircraft workers are frequently injured by flap movement. Ramp communication is often ineffective.
- Bird ingestion hazards continue to concern operators at many airports, despite increased efforts in some regions to discourage flocking birds from the airport vicinity.
- On push-back from the stand, the corner of a tractor cab struck the aircraft radome.
- A baggage trolley struck an aircraft and punched a hole in the starboard wing/body fairing.
- During loading of a heavy freight item, a forklift hit and punctured the forward hold door.
- As a driver brought a baggage container to the aircraft for loading, he passed between the undercarriage panels and the No. 3 engine. The container hit the undercarriage panel.
- Ramp personnel improperly stowed the forward airstair door without fully retracting the handrails, causing internal aircraft damage that jammed aileron control cables, and which was discovered later in flight. The handrails tore out crossmembers under the cabin floor, breaking off two aileron cable brackets and their pulleys. A ground crewman inadvertently had a hand on a microswitch that overrode the handrail retraction during stowage.

- Ground personnel locked a commuter aircraft's main cabin door from outside before the aircraft departed the ramp. On taxi-out, an emergency occurred and the door could not be opened from inside, forcing passenger evacuation through the overwing and rear emergency exits.
- A thunderstorm with strong winds pushed a baggage cart into the right propeller with the engine running. The propeller shattered and debris caused major damage to the wing. The cart had not been secured properly with parking brake set.
- A baggage-tug driver from another company assumed right-of-way over moving aircraft on the ramp to obstruct and delay them.
- Chart inaccuracy showed a mining pit 1,400 feet (425 meters) from the runway instead of the actual 300 feet (91 meters). Runway excursion could result in hitting boulders lining the pit or going into the pit itself.
- Signage on ramp and taxiways was cited frequently as poor and inadequate. Similarly, hold-short stripes and taxi lines were reported to be of varying visibility.
- Control of pedestrians walking from aircraft across the ramp to the terminal was often poorly directed, offering opportunities for tragedy. Passengers were killed recently in Washington, D.C., because of careless operation of a ground vehicle, which struck them as they were walking to the terminal.
- Vehicle collisions presented fire hazards. Drivers need training and supervision.
- Construction barriers were frequently erected without regard to aircraft maneuvering clearance. Intent of the barriers should be specific, e.g., parking of vehicles or stockpiling of materials, and barrier heights should be carefully regulated so they do not interfere with aircraft structures during ground movement.
- Attention must be given to the proper response to a fuel spill, especially when the aircraft is connected to the terminal via the jetway and passengers are aboard. The pilot is usually not in direct communication with the fueller, and communications between fueller and dispatcher are often inadequate. The airport manager must be aware of incidents to move promptly to ensure proper protection.

## Apply Commonsense Management

There are remedies and safeguards for each of these situations. Some require investment of additional resources. Frank McGuire, writing in FSF's January/February 1992 *Airport Operations* bulletin, noted that virtually every ramp incident or accident could be prevented. No high-tech equipment or complicated procedure is needed, just some basic common sense and an awareness by people who operate vehicles and aircraft on the ramp.

Fortunately, many airports are effectively addressing these situations, and the Airports Association Council International (AACI), working with national and international authorities, is directing attention and resources to resolving the more serious problems. But we have a long way to go to reduce substantially human error in ground operations.

Capt. Augustino Ferrari of Aeroporti di Roma said during FSF's International Air Safety Seminar in Rome in 1990 that competent and qualified managers are the key to safe airport operation. He has applied this principle at Aeroporti di Roma, ensuring that all departments fully recognized the overall situation and their own responsibilities. Review of ramp personnel training, communications methods and supervisory management techniques all contributed to establishing a positive attitude among personnel that has resulted in a noticeable decrease in safety incidents and in accident costs.

Airport safety audits are practiced by many airlines to ensure that risks are controlled. Airport managers should avail themselves of this method of safety assessment. [FSF's flight operational safety audits evaluate a company's flight and maintenance operations against the company's own established operating practices as well as against regulatory requirements of the particular state.]

Establishment of standards must be accompanied by an organizational philosophy that supports their implementation. This philosophy must be clear and unequivocal so that all employees fully understand the organization's commitment to the highest possible safety performance. Management must ensure that the organizational attitude is established in accordance with the stated philosophy and standards. Management also must reinforce continually and frequently this message by setting an example for employees and by prompt, firm and fair enforcement of established standards.

Another action that should be considered is for the AACI

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to establish a voluntary, confidential and non-punitive safety reporting system for all airport personnel, similar to the U.S. National Aeronautics and Space Administration's (NASA) highly effective voluntary Aviation Safety Reporting System (ASRS). Properly formulated and implemented, this could be a valuable source of early warning information that, once verified, management could use to prevent serious incidents. One of FSF's airline members in the Far East asks each incoming maintenance shift as it enters the workplace to seek and correct any discrepancies. This active reinforcement of alertness and safety awareness has drastically reduced the airline's workplace incidents.

The development of effective coordination between airport management and tenant company managements, to establish an overall safety management system at each airport consistent with the international and national airport system, will go a long way toward improving ramp safety. With a consistently effective and aggressive ramp safety program in place, the safe preparation of the aircraft to fly will be enhanced.

*(Adapted from a presentation made to the Airports Association Council International seminar on ramp safety, January 1993 in Rome, Italy.) ♦*

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## AIRPORT OPERATIONS

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