



Foreign Object Debris Control Program

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2.0 FORWARD

The purpose of this formal program is to increase the safety of aircraft operations and to reduce maintenance costs through the elimination of foreign object hazards.

Foreign Object Debris (FOD) has been part of accidents and unscheduled maintenance reports since the earliest days of flight. Propeller nicks, tire damage, and fabric tears go way back. But the problem of foreign objects really came into focus with the introduction of the jet engine.

This damage can result in anything from minor repairs to catastrophic events. FOD can be found anywhere in the aviation environment--from the manufacturing plant to airport terminal gates, cargo aprons, taxiways, runways, and run-up pads.

2.1 The Four Cornerstones of FOD Control

Any FOD control program is a multifaceted initiative and like all ongoing safety programs, it stretches out across time. Creating it, implementing it, and maintaining its effectiveness over a period of years includes some basic elements called the Four Cornerstones of FOD Prevention.

Management Support is the First Cornerstone – Management Support is the key to the success of any program. A strong and visible commitment on the part of senior management must be the foundation of the program.

Everyone working airside has a stake in decreasing instances of FOD. This includes all airport operations, airlines, security, ground handlers, and contractors. Management must support the efforts to build and maintain a healthy FOD Control Program, with a focus on ensuring all stakeholders understand their responsibility.

The Second Cornerstone is Training – A one-time five-minute blurb about FOD that is included in the training to get an airside driver's permit is not sufficient. If the program is going to be effective, FOD awareness training and promotion must be ongoing and consistent.

A simple phrase such as "Clean as You Go" can be woven into all facets of the promotion to keep stakeholders focused on the task.

Cornerstone Number Three is Housekeeping – The largest percentage of foreign object damage can be traced to housekeeping issues and one of the most important keys is good trash management. Every aircraft servicing operation, cargo or passenger, has the potential to generate foreign objects and most of them do generate something that can find its way to the ground. The same potential exists with every company and their employees doing any kind of work on the airside. So, if FOD prevention is going to be successful, more trash is going to need a home.

That means properly sized and marked FOD containers, and enough of them with a reasonable spacing around the airside to ensure workers won't have to walk very far to deposit foreign objects. Expanding this same concept applies to dumpsters and other large trash collection points. There must be enough of them to accommodate the volume of trash generated and be well placed. All containers must be emptied on a scheduled and on-demand basis.

The Final Cornerstone is Inspections – Inspections must be conducted, documented, analyzed and potential improvements identified acted upon.



An engine from a U.S. Navy A-6E that crashed shortly after takeoff.

3.0 DEFINITIONS OF KEY TERMS

Foreign Object Damage is any damage attributed to a foreign object that can be expressed in physical or economic terms that may or may not degrade the product's required safety and/or performance characteristics. Typically, FOD is an aviation term used to describe debris on or around an aircraft or damage done to an aircraft.

Foreign Object Debris (FOD) is any uncontrolled solid objects or materials on airside or groundside surfaces which are capable of damaging aircraft, vehicles, and structures or injuring persons. Anything that can find its way into an aircraft engine or flight control mechanisms is a recipe for foreign object damage.

FOD Critical Area is any area where flight hardware is in place and exposure to foreign objects would potentially cause a system or product failure due to deterioration, malfunction, or damage.

This FOD from a Continental Jet:



Caused the Concorde crash, July 25, 2000:



The Concorde fleet was permanently grounded.

4.0 ACTUAL AND POTENTIAL FOREIGN OBJECT HAZARDS

There are many materials that are classified as causes of FOD.

- Debris Created from Airside Surface Materials
 - Sand, stones, mud
 - Broken pavement pieces
 - Uprooted joint filler materials
 - Grass, etc.
- Debris Originating from Airside Traffic
 - Mud, stones carried from access roads
 - Cargo/payloads
- Debris Originating from Airline Carriers
 - Miscellaneous cargo debris
 - Miscellaneous luggage debris
 - Food (from Food Services loading/unloading)
- Debris Originating from Aircraft Operations
 - Tools, repair materials
 - Aircraft parts
- Debris Originating from Climatic/Environmental Influences
 - NACC, jet sand
 - Slush, ice, salt, mud
 - Birds, animals
- Debris Originating from Groundside
 - Mud, dirt, stones, loose gravel
 - Miscellaneous papers
- Debris Originating from Consumables
 - Safety glasses
 - Glue, paint, sealant
 - Rags
 - Sandpaper, brushes, applicators
 - Hardware – rivets, washers, fasteners, etc.

5.0 FOD CONTROL PROGRAM OVERVIEW

5.1 Nature and Purpose of FOD Control Program

The purpose of the FOD Control Program is to prevent and control foreign object hazards on and near all aircraft movement areas. Greater prevention and control of foreign object hazards will reduce incidents of damage, personal injury, and breaches of aircraft safety.

5.2 On-Site Authority

The Director, Airport Operations is responsible for establishing and maintaining a FOD Control Program that reflects the operational and safety needs of their airport.

5.3 FOD Control Committee

The FOD Control Committee consists of the Director, Airport Operations, the Director, Safety & Security, Airport Operations staff, tenant representatives where applicable, and any other appointed members as appropriate.

The FOD Control Committee serves the following functions.

- Plan preventive measures for the control of foreign object hazards.
- Administer the implementation of the FOD Control Program.
- Conduct regular audits of the program.
- Review the effectiveness of the program and make refinements as required.

NOTES:

1. Tenant representatives refers to representatives of commercial airlines and corresponding support groups such as fuel dispensing crews and support service companies.
2. Until such time as scheduled passenger service returns to Red Deer Regional Airport, Committee members will be limited to Airport staff. Effectiveness of the FOD program will be reviewed at each monthly safety meeting.

5.4 FOD Control – Education and Training

The requirements of the FOD Control Program are communicated and reinforced through formal and informal education and training for all airside personnel via training films and videos, group discussions/training sessions, newsletters, etc.

Training subjects should include:

- Proper storage, shipping, and handling of materials, components, and equipment
- Techniques to control debris
- Proper housekeeping
- Accountability/control of tools and hardware
- Control of personal items, equipment, and consumables
- Reporting of FOD incidents or potential incidents.

6.0 GUIDELINES FOR FOD CONTROL AND PREVENTION

6.1 Airside FOD Inspections

As foreign object hazards may originate from many sources, daily inspections of all aircraft movement areas are to be performed. All Operations Staff are responsible for conducting both formal and informal inspections on an ongoing basis.

In addition, all tenants, operators, and contractors at the Airport are responsible for ensuring that inspections are conducted in their work areas on a regular basis.



6.2 Tool Count

All personnel must account for all hand tools and hardware used during the repair and maintenance of aircraft or facilities on airside areas.

This may be accomplished through paperwork, task-specific kit hardware, tote trays, covered spring-loaded containers, tethering of tools, shadowbox tool kits, etc.

6.3 Vehicle Checks

Ground service vehicles are a common source of foreign object hazards. Often small components such as nuts and bolts fall off vehicles. Also, dirt, stones and other debris is tracked from groundside to airside or unpaved surfaces to aircraft movement surfaces.

To reduce the chance of depositing foreign objects on the airside surfaces, vehicles should be carefully checked on the groundside, with special attention given to:

- Checking tire treads for debris.
- Checking truck beds for loose debris, materials, or tools.
- Checking vehicle body and under-carriage for build-up of debris.
- Ensuring that truck payloads are secured and covered as required.

6.4 FOD Hazard Awareness

As noted earlier, all airside personnel should realize the importance of FOD control and know their roles within the program. These requirements are addressed through education and training and re-enforced through the placement of reminder signs in critical airside areas.

6.5 Proper Housekeeping Procedures

The main part of FOD control involves the use of proper airside housekeeping procedures. This applies both to preventing potential FOD and to controlling existing foreign objects hazards.

Housekeeping should be included as part of each employee's job description. A "Clean-As-You-Go" mindset should be encouraged. Ensure taxiways, runways, and aprons are kept free of FOD; include regular sweeping and vacuuming. Ensure all construction debris is removed, particularly at the end of each task and/or shift.

6.6 Preventative Maintenance

Maintenance activities which may be undertaken to prevent FOD include the following.

- **Regular paved surface maintenance**, to prevent a build-up of broken asphalt, concrete, stones, or joint filler material.
- **Stabilization of shoulders** along runways, taxiways, and aprons in to prevent soil from being blown by jet blasts or from being disturbed by wind currents created by aircraft wings. The stabilization of shoulders may be achieved through compaction, paving or the planting of grass.
- **Proper drainage system maintenance** to ensure water is effectively removed from aircraft movement areas and to prevent erosion.
- **Proper bird and wildlife control** to prevent interference with safe aircraft operations.

6.7 Maintenance to Control Existing FOD Hazards

- The sweeping of aircraft movement areas is the most effective method of controlling foreign object hazards as soil, stones, sand, or ice. Loose materials should be swept in one direction, with an overlapping pattern.
- Because mechanical sweepers do not clean concrete joints and cracks, sweeping an area mechanically is only the first stage of an overall cleaning operation. The second stage involves inspecting the area to determine if additional sweeping is required. In some cases, hand-sweeping with push brooms may be necessary.
- When operating mechanical sweepers, use care to avoid excessive casting of material. Also use caution to prevent excess broom bristle break-up, as bristles become foreign object hazards.
- Organic matter such as cut grass, fallen leaves, etc., is not a major source of FOD but normal care should be taken to prevent this material from being deposited on aircraft manoeuvring areas. In some instances, loose grass cuttings have obstructed aircraft heat exchangers.

6.8 Removal and Reporting of FOD

All airside personnel are responsible for preventing and controlling FOD. FOD should be picked up when spotted. General debris should be deposited in FOD disposal receptacles provided. FOD that may be aircraft or field maintenance related should be delivered to Airport Operations personnel.

Potential FOD should be reported to your supervisor and/or Airport Operations personnel (403-886-4833, Option 1). This includes the reporting of:

- Erosion.
- Pavement break-up.
- Loose joint filler.
- Excessive debris on grass shoulder surfaces.
- Tenant/operator/contractor violations of the FOD Control Program.
- Any other hazards observed.

Airside construction projects must be closely monitored, with the requirement for continuous clean-up being enforced.

FOD found in a plane is to be reported to local Air Traffic Control.

Hazards that do not pose an immediate threat may be reported as a Safety Concern on our website; if the FOD has already been picked up, it can also be reported on our website.

6.9 Investigation

When a FOD incident occurs, an investigation should be initiated to determine the cause where possible. Cause and corrective action should be ascertained in a timely manner to preclude similar reoccurrences. Affected organizations and personnel should be advised of any investigation results. Corrective actions should be evaluated for effectiveness.