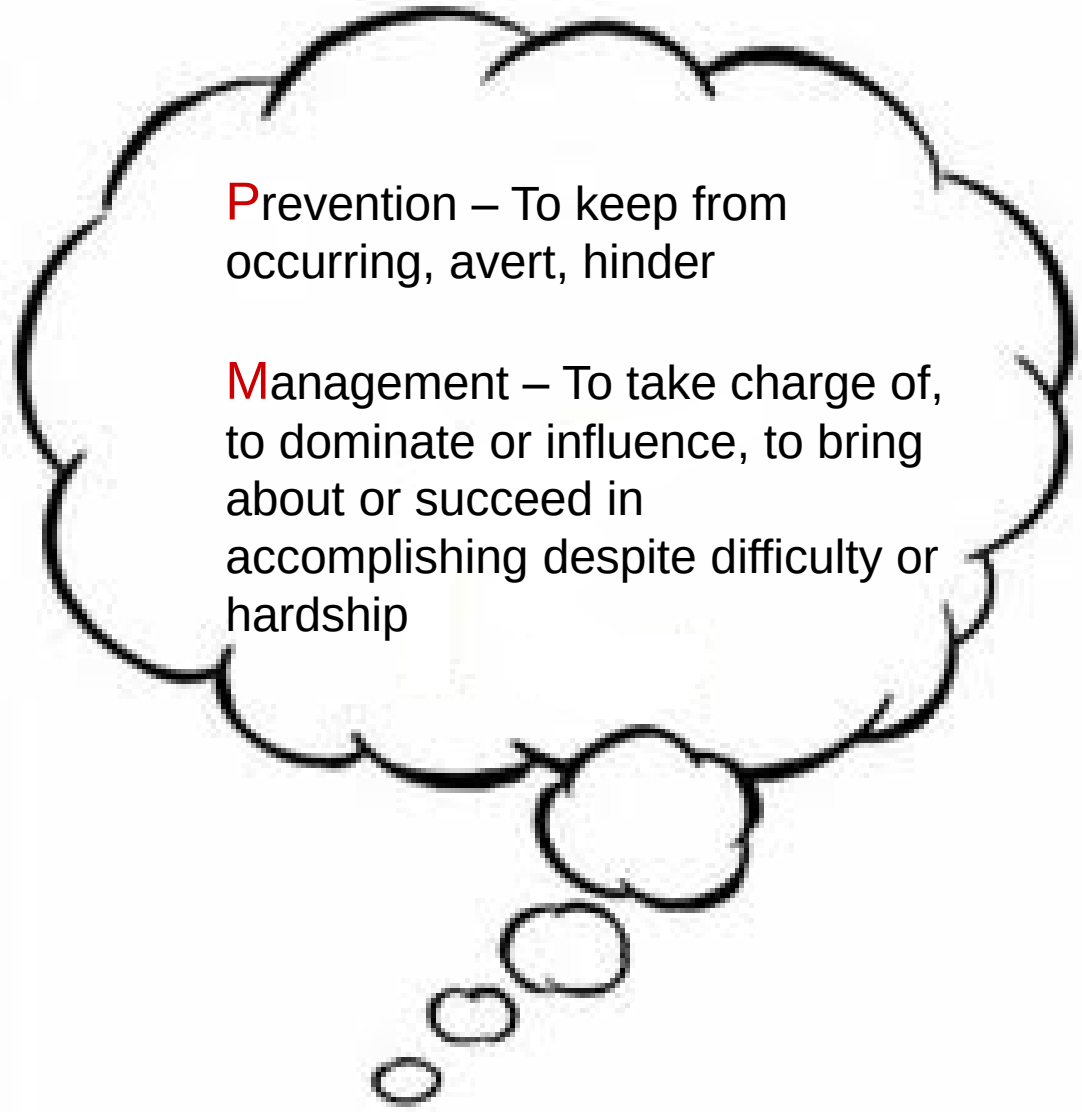
National Aerospace FOD Prevention, Inc. Conference
August 16-18, 2011
“A Key Component to Operational Excellence”

“Airline F.O.D. Prevention”

DELTA

Do You Know The Difference…

Delta Air Lines Approach
“FOD Prevention vs. FOD Management”


Prevention – To keep from occurring, avert, hinder
Management – To take charge of, to dominate or influence, to bring about or succeed in accomplishing despite difficulty or hardship

The key components of Delta's FOD Prevention and Management Program can be identified with (4) W's:

-Why do we need a FOD program

-Who is responsible for FOD prevention

-What tools and resources are available to assist with FOD prevention and removal

-Where does FOD damage occur, where does FOD come from

FOD Prevention

A prevention program to control airport FOD is most effective when it addresses four main areas:

Training – who should be trained, frequency, and content

Inspections - airline, airport, and airplane handling agencies

Money – the cost of FOD to the airline

Employees – accepting ownership

Training

Delta training requirements mandate that all affected employees complete recurrent ground operations training annually. As part of that training we include FOD Prevention and Management. Delta's approach to FOD training focuses on two areas identification and removal.

Identification – Understanding the types of FOD found in the work areas and where the FOD originates.

Removal – Identification of tools available for FOD removal and processes to follow when conducting removal.

Further as part of their training each operating division must review with its employees their FOD prevention and Management program.

Note: These training requirements shall include any contractor service that enters these FOD critical areas.

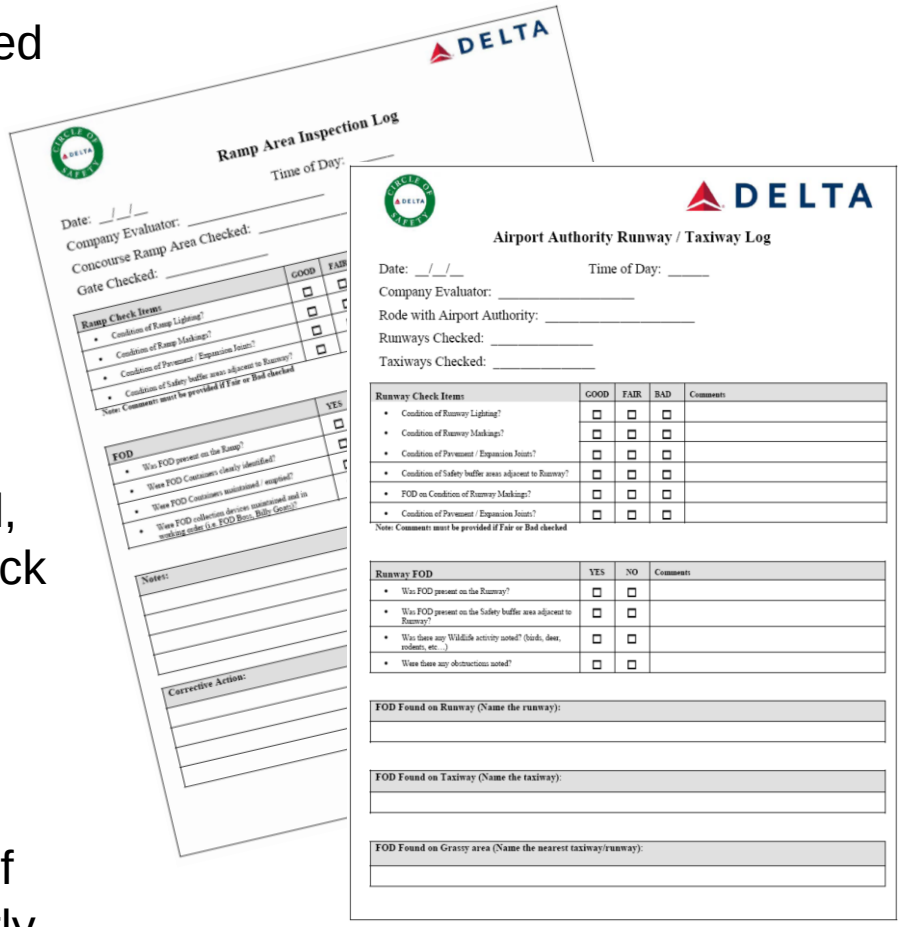
Inspections

Each affected operating division is required to maintain a FOD Prevention and Management Program. Divisional programs should include an inspection process. The following areas shall be inspected:

Gate Areas - FOD checks conducted at each gate area prior to any aircraft arrival, prior to pushback, and after each pushback

Airport Areas - FOD checks of runways and taxiways at least monthly

Ramp Operations Areas – FOD checks of all ramp operations areas at least quarterly for conditions



DELTA

Ramp Area Inspection Log

Time of Day: _____

Date: __/__/__

Company Evaluator: _____

Concourse Ramp Area Checked: _____

Gate Checked: _____

Ramp Check Items:	GOOD	FAIR
• Condition of Ramp Lighting?	☐	☐
• Condition of Ramp Markings?	☐	☐
• Condition of Pavement / Expansion Joints?	☐	☐
• Condition of Safety buffer areas adjacent to Runway?	☐	☐

Note: Comments must be provided if Fair or Bad checked

FOD	YES
• Was FOD present on the Ramp?	☐
• Were FOD Containers clearly identified?	☐
• Were FOD Containers maintained / emptied?	☐
• Were FOD collection devices maintained and in working order (i.e. FOD Boss, Bobby Green)?	☐

Notes:

Corrective Action:

DELTA

Airport Authority Runway / Taxiway Log

Date: __/__/__ Time of Day: _____

Company Evaluator: _____

Rode with Airport Authority: _____

Runways Checked: _____

Taxiways Checked: _____

Runway Check Items:	GOOD	FAIR	BAD	Comments
• Condition of Runway Lighting?	☐	☐	☐	
• Condition of Runway Markings?	☐	☐	☐	
• Condition of Pavement / Expansion Joints?	☐	☐	☐	
• Condition of Safety buffer areas adjacent to Runway?	☐	☐	☐	
• FOD on Condition of Runway Markings?	☐	☐	☐	
• Condition of Pavement / Expansion Joints?	☐	☐	☐	

Note: Comments must be provided if Fair or Bad checked

Runway FOD	YES	NO	Comments
• Was FOD present on the Runway?	☐	☐	
• Was FOD present on the Safety buffer area adjacent to Runway?	☐	☐	
• Was there any Wildlife activity noted? (birds, deer, rodents, etc…)	☐	☐	
• Were there any obstructions noted?	☐	☐	

FOD Found on Runway (Name the runway):

FOD Found on Taxiway (Name the taxiway):

FOD Found on Grassy area (Name the nearest taxiway/runway):

Money

On average Delta spends approximately $16,000,000 on FOD damage repairs.

Common FOD damage expenses:

Engine damage – degraded performance, blade burnishing, blade replacement, fan changes, complete engine overhauls, destroyed engines

Fuselage damage – dents, holes, broken antenna

Tire damage – cuts, loss of pressure, complete failures

Flight delay/cancellation costs

Employees

Employee's involvement will determine the success of a FOD Prevention program. At Delta we utilize several methods to encourage employee involvement.

Events like our "Food for FOD" activity encourage employees to take ownership in their work areas and in return for participating in FOD removal they are provided lunch on the day of the event.

Annual FOD walks sponsored by local airport authorities are also a great opportunity for our employees to get involved – of course there is the hope that they win the raffle at the end of the event – two free round trip tickets.

FOD Management

FOD Management is most effective when it addresses four main areas:

Tools – resources available for FOD removal

Identification – what types of FOD are in the area and where did it originate

Maintain – programs and process

Engagement – employee's ownership of their work area

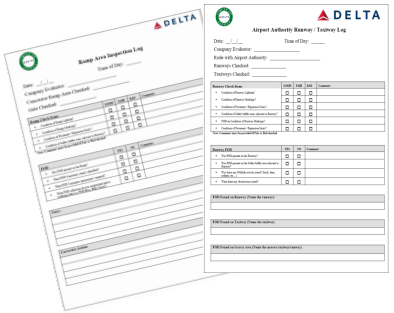
Tools

Delta utilizes many tools in its FOD Management program, from corporate policies to equipment.

Corporate Policies
-Divisional Programs
-Ramp / Runway Inspections
-Damage Identification Process (FAST Test)
-FOD Training

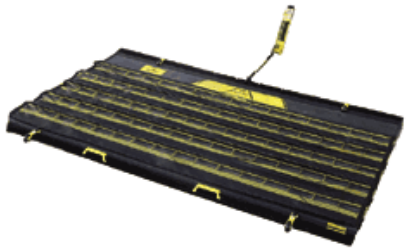
Equipment
-FOD Containers
-Billy Goat Vacuums / Motorized Vacuum
-FOD Boss Sweepers
-Brooms
-Magnets

Corporate Policies and Procedures



Billy Goat Vacuum

FOD Boss

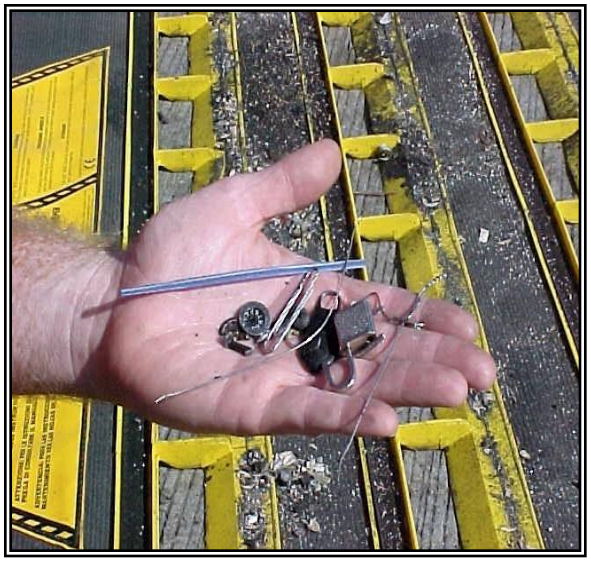


Identification

What's damaging our aircraft? Delta utilizes an analysis program that accurately answers this question. On selected damages Delta uses this program to analyze the microscopic particles left on the aircraft by the object that struck the aircraft.

Through extensive research, it has been found that when a foreign object strikes an aircraft with sufficient force it will leave remnants of itself on the aircraft. By analyzing the remnants of these objects and other forensic evidence we are able to determine what has damaged the aircraft.

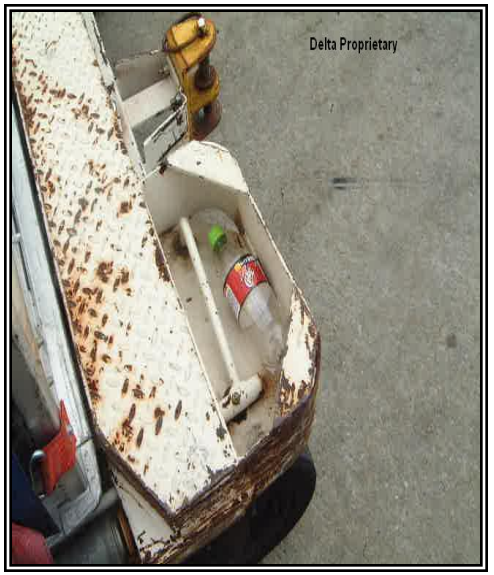
Further, by identifying what is damaging our aircraft we can move toward preventing induction of these items into our operation.



Maintain

Ground service equipment shall be maintained free of FOD. All ground equipment including baggage tugs, jet tugs, carts, containers, etc., shall be inspected daily and all debris removed prior to use.

Ramp personnel shall ensure cargo bins are inspected and debris removed on every RON aircraft. Ramp personnel shall perform local inspection on all aircraft during the loading/unloading process.



Engagement

Management / Leadership
–Develop a FOD Prevention and Management Program
–Training
–Observations
–FOD Prevention Committee(s)
–FOD Identification and Removal

Employees
–FOD Walks
–Ramp Inspections
–FOD Identification and Removal

Summary

Why does Delta need a FOD Prevention and Management Program? It makes good cents.

An effective program takes TIME.

Management and Employee ownership are the key to the program's success.

FOD prevention is the foundation for operational excellence.

Questions?