



Supply Chain Management Handbook (SCMH)

Foreign Object Debris (FOD) Guidance Material Overview

October 2013





Overview Content

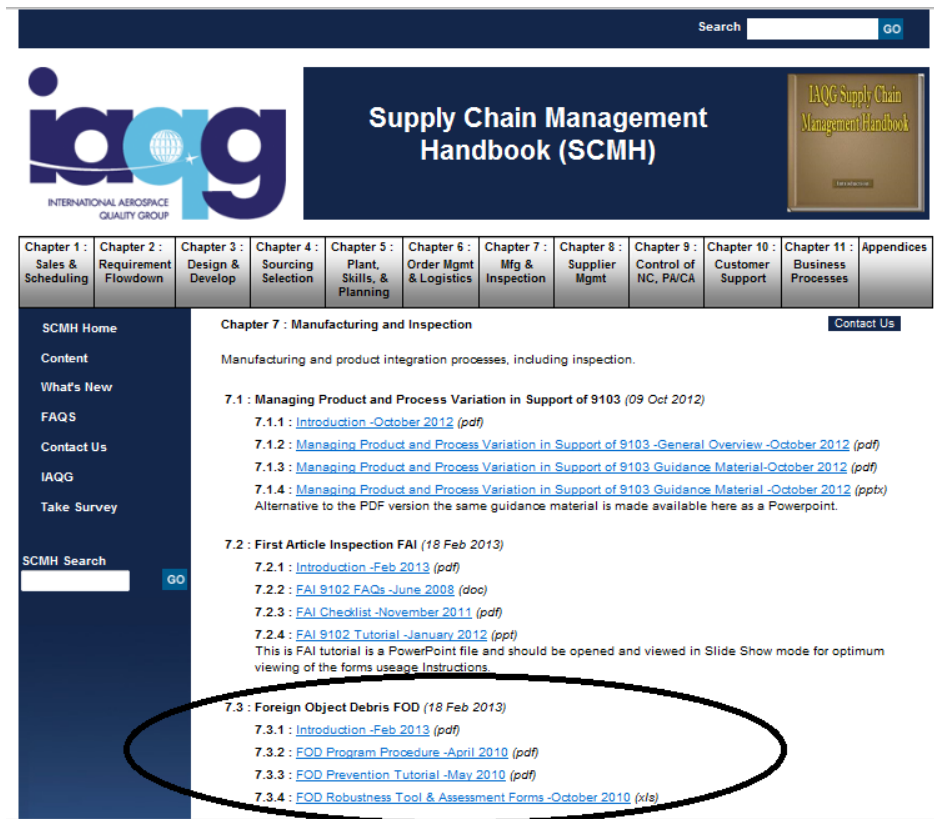
Supply Chain Management Handbook (SCMH) –A quick look.

Foreign Object Debris FOD

- **Available SCMh Guidance Material**
 - FOD Program Procedure
 - Prevention Tutorial
 - FOD Robustness Tool & Assessment Forms
- **Discussion and Feedback**



Supply Chain Management Handbook (SCMH)



The screenshot shows the IAQG Supply Chain Management Handbook (SCMH) website. The header includes a search bar and the IAQG logo. The main content area displays the title 'Supply Chain Management Handbook (SCMH)' and a list of chapters. A sidebar on the left contains navigation links such as 'SCMH Home', 'Content', 'What's New', 'FAQs', 'Contact Us', 'IAQG', and 'Take Survey'. The main content area is titled 'Chapter 7 : Manufacturing and Inspection' and lists various documents and tutorials. A black oval highlights the section '7.3 : Foreign Object Debris FOD (18 Feb 2013)' and its sub-items.

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Supply Chain Management Handbook (SCMH)

IAQG Supply Chain Management Handbook

Chapter 1 : Sales & Scheduling	Chapter 2 : Requirement Flowdown	Chapter 3 : Design & Develop	Chapter 4 : Sourcing Selection	Chapter 5 : Plant, Skills, & Planning	Chapter 6 : Order Mgmt & Logistics	Chapter 7 : Mfg & Inspection	Chapter 8 : Supplier Mgmt	Chapter 9 : Control of NC, PA/CA	Chapter 10 : Customer Support	Chapter 11 : Business Processes	Appendices
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Chapter 7 : Manufacturing and Inspection

Manufacturing and product integration processes, including inspection.

7.1 : Managing Product and Process Variation in Support of 9103 (09 Oct 2012)

- 7.1.1 : [Introduction -October 2012 \(pdf\)](#)
- 7.1.2 : [Managing Product and Process Variation in Support of 9103 -General Overview -October 2012 \(pdf\)](#)
- 7.1.3 : [Managing Product and Process Variation in Support of 9103 Guidance Material-October 2012 \(pdf\)](#)
- 7.1.4 : [Managing Product and Process Variation in Support of 9103 Guidance Material -October 2012 \(pptx\)](#)
Alternative to the PDF version the same guidance material is made available here as a Powerpoint.

7.2 : First Article Inspection FAI (18 Feb 2013)

- 7.2.1 : [Introduction -Feb 2013 \(pdf\)](#)
- 7.2.2 : [FAI 9102 FAQs -June 2008 \(doc\)](#)
- 7.2.3 : [FAI Checklist -November 2011 \(pdf\)](#)
- 7.2.4 : [FAI 9102 Tutorial -January 2012 \(ppt\)](#)
This is FAI tutorial is a PowerPoint file and should be opened and viewed in Slide Show mode for optimum viewing of the forms usage Instructions

7.3 : Foreign Object Debris FOD (18 Feb 2013)

- 7.3.1 : [Introduction -Feb 2013 \(pdf\)](#)
- 7.3.2 : [FOD Program Procedure -April 2010 \(pdf\)](#)
- 7.3.3 : [FOD Prevention Tutorial -May 2010 \(pdf\)](#)
- 7.3.4 : [FOD Robustness Tool & Assessment Forms -October 2010 \(xls\)](#)

A quick look at the SCMh

www.iaqg.org/scmh

Available Guidance Materials found in Chapter 7.3

- I. FOD Program Procedure**
- II. FOD Prevention Tutorial**
- III. FOD Robustness Tool & Assessment Forms**

Referenced Documents

- **The processes and guidelines outlined in this section are based on;**
 - **NAS 412, the National Aviation, defense, and space Standard (NAS)**
 - **NAS 412 supports AS/EN/JISQ 9100,**
 - **FOD prevention policy/procedure of the Aerospace Industries Association (AIA).**



Background:

- **The impact of foreign object debris (FOD) remains a major concern in the aviation, defense, and space industry.**
 - It is viewed as a major potential source of risk (condition + action) by regulators and customers.
 - Lack of FOD prevention often leads to significant problems with the quality or cost of delivered product and ultimately threatens product and personal safety



The purpose of the SCMH Guidance Material is;

- **To outline fundamental approaches and provide basic guidelines for suppliers in the aviation, defense, and space industry to assess their processes and establish/implement a FOD prevention program**
- **To provide effective means for suppliers to develop FOD prevention measures and policies through;**
 - **FOD baseline procedure**
 - **FOD checklists**
 - **FOD prevention training/tutorial**
 - **a risk-based FOD assessment process**

The aim is to prevent the occurrence and risk of FOD and improve the quality of industry suppliers by sharing best practices.



What is FOD?

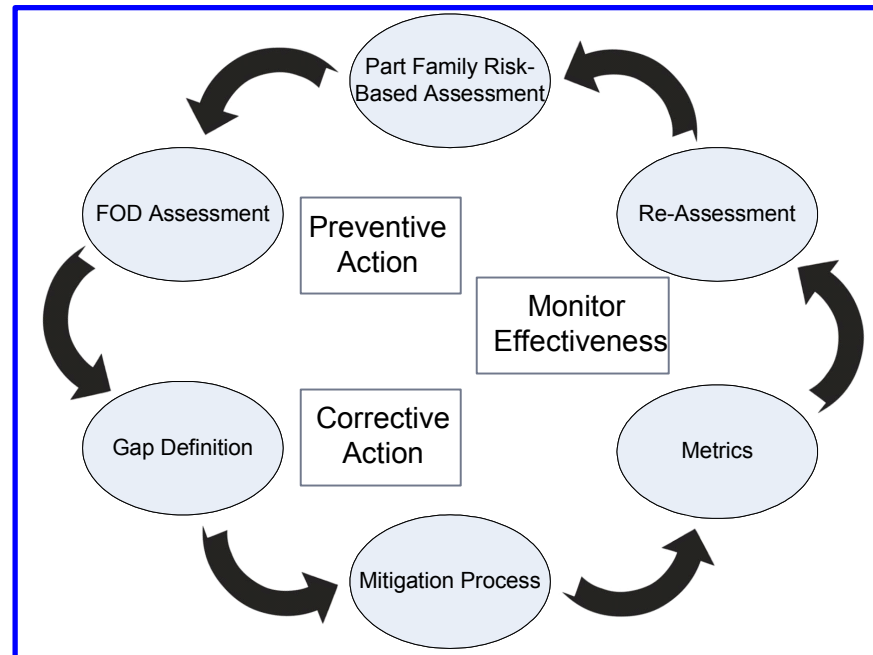
- Foreign Object Debris (FOD)

A substance, debris, or article alien to the component, assembly, system or vehicle that could cause damage.

- Foreign Object Damage (FOD)

Any damage or incident 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.





BASIC ATTRIBUTES OF A FOD PREVENTION PROGRAM

Establishing and maintaining an effective FOD prevention program involves using a “continual improvement” cycle approach that proactively addresses the events (conditions and actions) leading to FOD.

- Foreign material comes in many shapes and forms. It may present itself as a hand tool, dust, grime, oil, metal shavings, loose nuts, bolts, cotter pins, lock wire remnants, pencil, pen, packing material, etc.
- It is a fact that foreign objects and/or debris have contributed to jammed flight controls, engine damage, electrical shorts, fluid contamination, control valve failures, fires and other major failure incidents that have resulted in costly material damage, loss of vehicle and of life.
- FOD may cause many failures and damages, but worst of all – it might cause injuries and even loss of human life!
- FOD can also cause damage to the company's finances and reputation.





I. FOD Examples



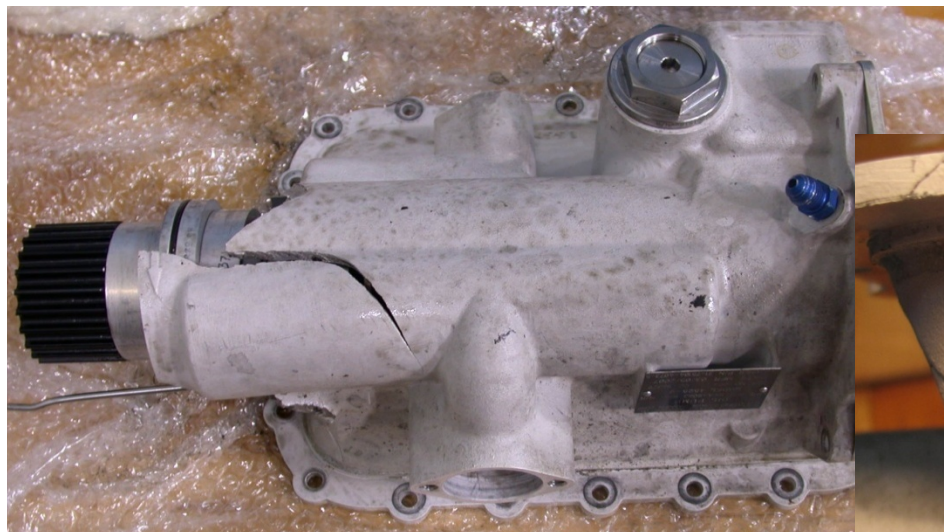
I. FOD Examples



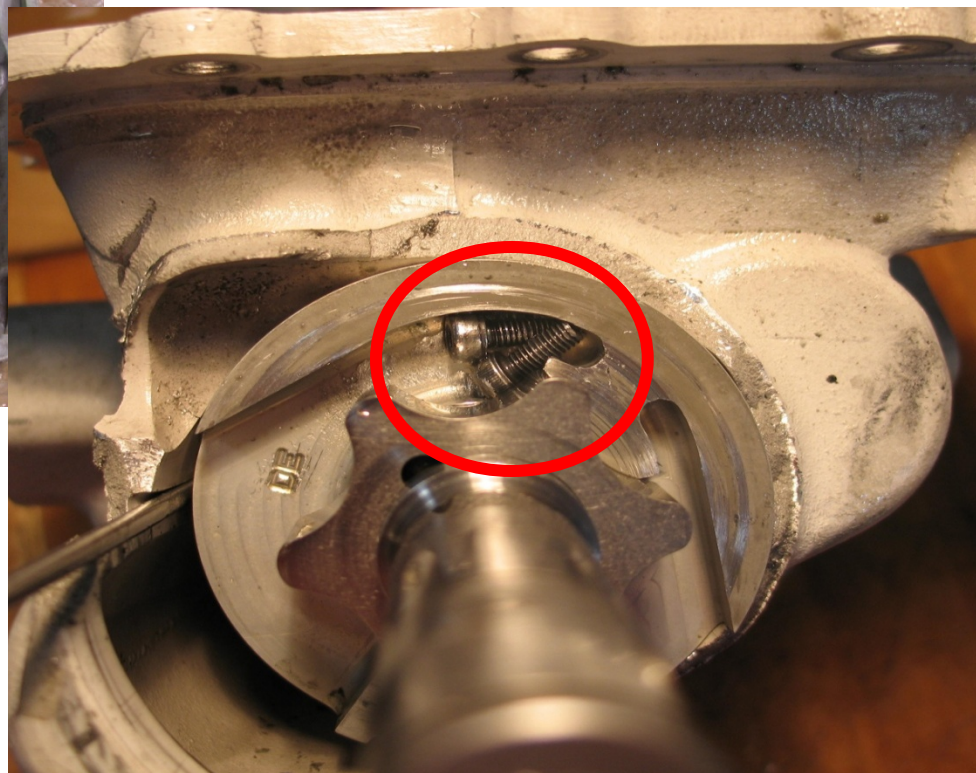


Examples

Assembly Process Debris Fasteners-FOD



This pump blew after ingesting several screws. Small FOD can cause big problems.



- Small particles are NOT FOD for some items, but are destructive and can cause failures in others.
- So, FOD is a matter of the potential failure mode and the requirements of the product or item.
- Even dust and dirt can be FOD if the item is small enough, but not a problem for larger equipment.
- Engineering determination through a FMEA or other risk analysis is suggested

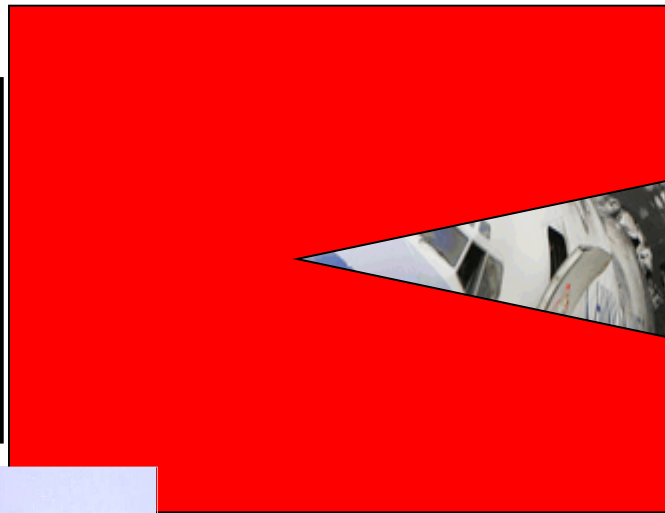


The “degree” of FOD



Examples

Small, seemingly insignificant items
can lead to Big Problems



The presented topics Include;

- Objective
- Definition
- Training Program Topics:
 - proper storage; shipping & handling; techniques to control debris; housekeeping; cleaning, inspection; accountability/ control of tools, hardware, personal items, equipment and consumables; care and protection of end items; Quality workmanship (“Clean-As-You-Go,” Inspection); how to report FOD incidents or potential incidents
- Examples of FOD
- Outcome of FOD



Presented topics include (continued);

- **Failures caused by FOD**
- **What is 6-S**
- **Proper storage, shipping and handling of material, components, and equipment.**
- **Methods For Preventing FOD**
- **Simple Rules To Help Prevent FOD**
- **Lost Item Program**
- **PEOPLE IN THE PROCESS**
- **Responsibility for FOD**
- **Resources**



- [illegible]

FOD Program Attribute Description	Basic		Advanced		Robust	
	Req'd	Act	Req'd	Act	Req'd	Act
1) FOD Awareness / Training: Training consists of Periodic Awareness Training that includes topics on Control of Personal Items, Equipment & Consumables; Care and Protection of Product; General 6-S & Clean as you Go principles; and Tool Control/Accountability.	≤4	0	≤3	0	1	0
2) Parts Protection / Material Handling Parts protection & material handling procedures exist. Materials and accessories used in Packaging, Handling, Shipping and Storage are free of any contamination. Parts and assemblies are packaged to preclude FOD contamination.	≤4	0	≤3	0	≤2	0
3) General Housekeeping, 6-S Practices Assembly, Test, Manufacturing, Warehouse, and Operational Support areas are clean according to 6-S principals.	≤3	0	≤2	0	1	0
4) FOD Reporting and Investigation All FOD events are reported and investigated and should include the use of common root-cause analysis tools as part of the record. Personnel are aware of how to react in the event of a FOD incident. E.g. Not to disturb evidence, to cease operation, notify supervision immediately and begin investigative process. Corrective actions need to ensure effectiveness to taken to prevent recurrence.	≤4	0	≤3	0	≤2	0
5) FOD Management / Leadership: High level procedures exist. FOD Focal Point established, has limited authority, >33% but < 66% responsibility commitment.			≤3	0	≤2	0
6) Assembly, Manufacturing, and Facilities Processes Assembly, Manufacturing, and Maintenance Tasks are planned and sequenced to preclude FOD and entrapment of debris or other contamination. Documents define necessary processes for preventing, cleaning, and ensuring FOD free manufacturing, assembly, and maintenance operations.			≤3	0	1	0

Example FOD Maturity Tool

3) General Housekeeping, 6-S Practices Assembly, Test, Manufacturing, Warehouse, and Operational Support areas are clean according to 6-S principals.	Floors, work-surfaces and any other pertinent surfaces are cleaned / swept on an ad-hoc basis. No housekeeping awareness for external contractors. Clean-as-you go is the goal but evidence of implementation is severely lacking.	5	
	Floors, work-surfaces and any other pertinent surfaces are cleaned / swept on a periodic basis. External contractors are given FOD awareness briefings as part of their standard-work. Clean-as-you go is the goal, but with little evidence of implementation apparent.	4	
	A formalized 6-S program is in place in some areas of the facility. Floors, work-surfaces and any other pertinent surfaces are cleaned / swept on a periodic basis. External contractors are given FOD awareness briefings as part of their standard-work. Clean-as-you go is the goal with some evidence of implementation apparent in some areas.	3	
	A formalized 6-S program is in place in most areas of the facility. Floors, work-surfaces and any other pertinent surfaces are cleaned / swept on a periodic basis. External contractors are given FOD awareness briefings as part of their standard-work. Clean-as-you go is the goal with strong evidence of implementation apparent in most areas.	2	
	A formalized 6-S program is in place throughout the facility. Floors, work-surfaces and any other pertinent surfaces are cleaned / swept on a periodic basis and remain FOD free throughout the course of the day. External contractors are fully FOD briefed and maintain FOD Control while on the site, with FOD free status verified upon completion of work. Clean-as-you go is fully instilled through the entire facility.	1	

FOD Program Containment Checklist		
Source/Supplier:		Vendor Code:
Part / Product Family:		
Assessed By:		Date:
Prevention	Y/N	Objective Evidence / Comments
Processes include measures to prevent contamination of high risk areas, i.e. those that can not easily be cleaned or are not conducive to reasonable and effective FOD detection.		
Process review validates that prevention measures are effective and suitable. Note: The ability to clean and detect needs to be taken into consideration.		
Cleaning		
Processes include measures to clean debris from all areas of product.		
Process review validates that the cleaning measures are effective and suitable. Note: The ability to prevent and detect need to be taken into consideration.		
Detection		
Processes include measures to detect debris in all areas of product.		
Process review validates that detection measures are effective and suitable. Note; The (FOD Coded) Quality Record of the source needs to be taken into consideration.		



Feedback & Discussion

