QUALITY ASSURANCE PROGRAM PLAN FOR PREVENTION OF FOREIGN OBJECT DAMAGE (FOD) TO FLIGHT HARDWARE

1.0 PURPOSE

To define requirements for Foreign Object Damage (FOD) Prevention.

2.0 SCOPE

This procedure applies to any / all areas where personnel are in contact with components or final product.

3.0 APPLICABLE DOCUMENTS

29 CFR §1910 Subpart J (g)(4) OSHA - Sanitation
NAS 412 National Aviation, defense, and space Standard (NAS) FOD prevention policy/procedure of the Aerospace Industries Association
AS 9100 Quality Management Systems - Requirements for Aviation, Space and Defense Organizations
QCP 12.1 Corrective Action
QCP 18.0 Training of Personnel
QCP 20.0 Internal Quality Audit Procedure
SOP 52-10-005.8-00-001 Requirements for Suppliers for Prevention of Foreign Object Damage to Flight Hardware

4.0 DEFINITIONS

4.1 Foreign Object Damage (FOD): Any damage attributed to a foreign object, substance or matter which may or may not degrade the product’s required safety and/or performance characteristics.

4.2 Foreign Object Debris (FOD): A substance, debris or article alien to a product which would potentially cause damage.

4.3 Potential FOD: The condition where foreign object debris may cause damage, and/or failure should the product be put into use.

4.4 FOD Critical Area: Any area where flight hardware is placed and exposure to foreign objects would potentially cause a product failure due to deterioration, malfunction or damage.

4.5 5 S: A method for improving workplace organization using visual controls (i.e., Sort, Straighten, Shine, Standardize, Sustain) resulting in a positive impact on FOD prevision, productivity and Environmental Health and Safety (EHS).
5.0 GENERAL

5.1 The processes described in this procedure are based on NAS 412, which supports AS 9100, a quality management system standard which requires suppliers (and sub-tier suppliers) to carry out a program for the prevention, detection, and removal of foreign objects from its products.

5.2 A formal 5-S program is monitored as part of Eaton’s Continuous Improvement.

5.3 Personnel have the responsibility to assure that work practices do not allow the incorporation of foreign objects or contaminants.

5.4 Internal Audits review conformance to FOD requirements in accordance with AS 9100 and are accomplished per QCP 20.0 – Internal Quality Audit Procedure.

5.5 FOD Prohibition signs shall be posted in critical processing areas.

6.0 HOUSEKEEPING AND SAFETY

6.1 Unattended assemblies shall be properly protected to ensure protection from Foreign Object Debris.

6.2 Food and beverages may not be near unprotected flight hardware, including components or final product / assemblies.

6.3 Operational areas must remain clean to prevent debris from migrating into flight hardware.

6.4 Production, inspection, assembly and test areas should meet “good housekeeping” standards that promote the elimination of foreign objects and debris.

6.5 No employees shall consume food or beverages in any area exposed to a toxic material.

6.6 No food or beverages shall be stored in an area exposed to a toxic material in accordance with OSHA Regulations 29 CFR §1910 Subpart J (g)(4).

7.0 TRAINING

7.1 The site Quality Assurance Manager is responsible for implementing a Quality Assurance Program Plan for the Prevention of Foreign Object Damage (FOD). The QA Manager may delegate subsequent responsibilities for prevention, awareness and training as required.

7.2 The FOD Training Program exists to increase employee awareness on causes and effects of FOD, promote active involvement through specific techniques and emphasize good work habits.

7.3 FOD Training is given to an employee as part of New Hire Orientation. Annual FOD Training is presented to all employees who may be in physical contact with components or final product to maintain employee awareness. All FOD Training is documented in accordance with QCP 18.0 – Training of Personnel.
8.0 **FOD REPORTING AND INVESTIGATION**

8.1 FOD occurrences shall be reported and investigated in accordance with QCP 12.1 – Corrective Action.

9.0 **PROCESS REQUIREMENTS AND FOD PREVENTION**

9.1 Manufacturing Engineering will specify necessary practices required on operational sketches for the prevention of FOD.

9.2 Instructions may include instructions for operations including flushing, de-burring, edge breaking, cleaning, visual examination, etc. as applicable. Particular attention and awareness should be given to obscure and/or critical areas by special notations on operational sketches.

9.3 Specific packaging requirements shall define methods to prevent shipping damage and exclude foreign objects and contaminants.

9.4 Practices to prevent FOD shall include:

- Work areas and tools are wiped off as required to ensure no particles detrimental to product performance are present.
- Parts are cleaned prior to presentation at the assembly work station.
- Cleaned components and subassemblies have protective covering when not being processed.
- Waste producing operations, (e.g. lock-wiring, electrical assembly, lapping, etc.) are performed in designated areas separate from assembly areas.
- Work stations are maintained clean and neat with only essential items present.
- Tools and hardware accountability is performed by each operator.
- Packaging requirements shall include methods to prevent shipping damage and exclude foreign objects and contaminants.

10.0 **PURCHASED PARTS AND/OR PURCHASED OPERATIONS**

10.1 FOD Prevention requirements for purchased parts and / or operations shall be determined by Supplier Quality Assurance.

10.1.1 Purchase Orders shall include any specific instructions, Vendor Quality Requirements (VQR) and flow down SOP 52-10-005.8-00-001 - Requirements for Suppliers for Prevention of Foreign Object Damage to Flight Hardware as deemed appropriate.

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