

MIL-STD-980

30 July 1982

MILITARY STANDARD

**FOREIGN OBJECT DAMAGE (FOD) PREVENTION
IN AEROSPACE PRODUCTS**



AMSC S3118

QCIC

DEPARTMENT OF DEFENSE
Washington, D C 20301

Foreign Object Damage (FOD) Prevention in Aerospace Products

MIL-STD-980

1. This Military Standard is approved for use by all Departments and Agencies of the Department of Defense.
2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Defense Logistics Agency, Quality Assurance Management Support Office, 40TH DQMSO-S, 805 Walker Street, Marietta, GA 30060, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

MIL-STD-980

FOREWORD

The purpose of this standard is to establish the contractual requirements for a contractor program for the prevention of foreign object damage to aerospace products being modified, developed, repaired, overhauled, refurbished, maintained, or produced for the Government.

CONTENTS

		<u>Page</u>
Paragraph 1.	SCOPE - - - - -	1
1.1	General- - - - -	1
1.2	Application- - - - -	1
1.3	Relation to Other Contract Requirements- - - - -	1
2.	REFERENCED DOCUMENTS - - - - -	1
3.	DEFINITIONS- - - - -	2
3.1	Terms and Definitions- - - - -	2
3.1.1	Foreign Object (FO)- - - - -	2
3.1.2	Foreign Object Damage (FOD)- - - - -	3
3.1.3	FOD Prevention Program - - - - -	3
3.1.4	Potential FOD- - - - -	3
4.	GENERAL REQUIREMENTS - - - - -	3
5.	DETAILED REQUIREMENTS- - - - -	4

APPENDICES

Appendix A.	Identification and Elimination of Potential FOD Hazards Through Engineering Design Emphasis - - - - -	7
B.	Control of Debris During Maintenance/Manufacturing Operations- - - - -	9
C.	Prevention of FOD During Engine Test Cell Activities- - - - -	13
D.	Prevention of FOD During Flight Line Maintenance/Launch Operations - - - - -	15
E.	Investigation and Reporting of Foreign Object Damage (FOD) Incidents - - - - -	17
F.	Foreign Object Damage Prevention Training - - - - -	19
G.	Foreign Object Damage Prevention Focal Point- - - - -	21
H .	Tool Accountability and Hardware Control- - - - -	23

FOREIGN OBJECT DAMAGE (FOD) PREVENTION IN AEROSPACE PRODUCTS

1. SCOPE.

1.1 General. This standard establishes program requirements for prevention of foreign object damage to aerospace products. Aerospace products include aircraft, missiles, drones, satellites, engines, electronics systems, associated ground support equipment and components thereof. The FOD prevention program will provide for: application of FOD preventive measures during engineering design, development, test, manufacture, repair, operational and maintenance activities; training of personnel; and for the investigation of FOD incidents and initiation of corrective action to prevent recurrence. The reporting of FOD incidents and the requirements for proper disposition of damaged material will be addressed in this standard only to the extent necessary to describe the FOD prevention aspects of these actions.

1.2 Application.

1.2.1 General This standard is applicable to Department of Defense contracts for maintenance, modification, repair, overhaul, design, development and/or production of aerospace products and components thereof. This standard shall be applied to the extent specified in the statement of work. The word "contractor" as used in this standard may also be applied to government activities which develop, test, or modify military systems and equipment. This standard also applies to Government Furnished Property (GFP) provided to contractors in support of contract performance.

1.2.2 Degree of Application The FOD prevention program requirements and the degree of application shall be proportional to the sensitivity of the design of the products to FOD as well as to the FOD generating potential of the manufacturing methods.

1.3 Relation to Other Contract Requirements. The FOD prevention program shall be closely integrated with related efforts of design engineering, test, manufacturing engineering, system safety and, parts, materials and processes control to prevent duplication of effort and produce integrated cost effective results. If conflicts exist between the contract technical order of specification and this standard, the provisions of the contract technical order or specification shall prevail.

2. REFERENCED DOCUMENTS2.1 Government Documents.

2.1.1 Specification and Standards. Unless otherwise specified, the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this Standard to the extent specified herein.

MIL-STD-980

SPECIFICATIONS

MILITARY

MIL-Q-9858

Quality Program Requirements.

MIL-I-45208

Inspection System Requirements.

STANDARDS

MILITARY

MIL-STD-1520

Corrective Action and Disposition System for Nonconforming Material.

MIL-STD-1521

Technical Reviews and Audits for Systems, Equipment, and Computer Programs.

2.1.2 Other Government Documents and Publications. The following other government documents and publications form a part of this standard to the extent specified herein.

DAR Appendices B and C

Government Property in Possession of Contractors.

(Copies of specifications, standards and other documents required by contractors for implementation of this standard should be obtained from the contracting activity or as directed by the contracting officer, or from the DoD Single Stock Point, Commanding Officer, U.S. Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.)

3. DEFINITIONS.

3.1 Terms and Definitions. For the purpose of this standard, the definitions in MIL-STD-1521 apply to this standard. The following definitions also apply to this standard and take precedence in case of conflicts with the referenced standards.

3.1.1 Foreign Object (FO). A substance or article alien to the aircraft or assembly that has been allowed to invade the product. FO is further defined as:

3.1.1.1. Critical FO. Foreign Objects in the immediate area of or in areas from which migration is possible, e.g., through tooling holes, bend relief cutouts, drain holes, etc., and which could cause a system or component malfunction or deterioration.

3.1.1.2 Noncritical FO. Any FO not classified as critical.

3.1.2 Foreign Object Damage (FOD). Any damage attributed to a foreign object that can be expressed in physical or economic (monetary) terms which may or may not degrade the product's required safety and/or performance characteristics.

3.1.3 FOD Prevention Program. A formal, documented, disciplined program designed to prevent FOD caused by events or conditions under control of the contractor.

3.1.4 Potential FOD. The as-found condition where a FO is in a position to cause damage should the product be put into use. Examples are:

- a. Tools, manufacturing and inspection hardware, and other objects left in the vicinity of or in a migratory path of engine inlets.
- b. Metal or wire clippings, solder balls, and debris lying in the vicinity of electrical terminals, circuitry, connectors, components, etc.
- c. Tools, hardware or debris left in the vicinity or in a migratory path of a vehicle's control system.
- d. Debris lying on runways, ramps and taxiways.

4. GENERAL REQUIREMENTS.

4.1. General. The contractor shall establish and maintain an effective FOD prevention program that is planned, integrated, and developed in conjunction with design, development, safety, test, quality assurance, maintenance and manufacturing functions to reduce FOD to an absolute minimum.

4.2 Implementation. The contractor shall apply management and technical resources, plans, procedures, schedules, and controls needed to assure achievement of the requirements of this standard.

4.3 Procedures. The contractor shall establish written FOD prevention procedures to include the following basic elements:

- a. FOD Prevention Training.
- b. Design consideration for FOD prevention and resistance to damage or malfunction from FO.
- c. Assembly sequencing and maintenance/manufacturing techniques that will preclude FO entrapment.
- d. Maintain cleanliness of maintenance/manufacturing areas during the performance of work.

MIL-STD-980

e. Requirements for thorough cleaning of components, assemblies, and completed products.

f. Control of tools, personal items, fasteners and scrap material.

g. Requirements for the proper care and use of assembly and equipment protective devices.

h. Protection of the product and components thereof during handling, installation, and operation.

i. Requirements for the continuous vigilance by all personnel to prevent and properly dispose of potential FO.

4.4 Periodic evaluation. The contractor shall evaluate the FOD prevention program at least semiannually to assure adequacy and compliance.

4.5 Control of subcontractors and suppliers. The contractor's program shall assure that subcontractors and suppliers of equipment susceptible to FOD utilize effective FOD prevention practices.

4.6 Procedures review/program evaluations. The written procedures developed by the contractor for implementing requirements of this standard shall be subject to review by the government representative, and disapproval when the contractor's procedures do not accomplish their objectives. The Government, at its option, may furnish written notice of acceptability of the contractor's FOD prevention program. The Government reserves the right to perform necessary inspections, verifications, and evaluations deemed necessary to ascertain the contractor's conformance to requirements of this standard, adequacy of implementing procedures, and correction of deficiencies.

5. DETAILED REQUIREMENTS.

5.1 General. The detailed requirements for this standard are specified in the appendices herein and are applicable only to the extent specified in the contract.

6. NOTES.

6.1 Data requirements. When this standard is used in an acquisition, the data identified below shall be delivered only when the task paragraph(s) applicable to a specific DID is applied in a contract and the applicable DID is specified on the DD Form 1423, "Contract Data Requirements List (CDRL)." When the DD Form 1423 is not used and DAR 7-104.9(n)(2) is cited, the data identified below shall be delivered in accordance with requirements specified in the contract or purchase order. Deliverable data associated with the requirements of this standard is cited in the following paragraph:

Paragraph No.Applicable DID

Appendix E, para 20.2

DI-R-7101

(Copies of DIDs required by contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

CUSTODIANS:

ARMY-AR

NAVY-AS

AIR FORCE-23

Preparing Activity:

DLA-DH

Project No. QCIC-0026

APPENDIX A
IDENTIFICATION AND ELIMINATION OF POTENTIAL FOD HAZARDS
THROUGH ENGINEERING DESIGN EMPHASIS

10. SCOPE.

10.1 Scope. This appendix establishes the requirements for identification and elimination of potential FOD hazards through engineering design emphasis and is mandatory when specified in the contract.

20. REQUIREMENTS.

20.1 General. Contractor engineering procedures and requirements shall emphasize the reduction of risk and the potential for elimination of FOD hazards as basic design criteria. The contractor shall establish adequate procedures to meet this requirement and shall assure that product designs reflect adequate consideration for FOD prevention. These considerations shall include but not be limited to:

- a. Identification and elimination of FO entrapment areas.
- b. Identification and sealing of areas through which FO can migrate.
- c. Use of adequate connectors, filtering devices, and protective covers over critical mechanical, electrical, hydraulic, and pneumatic components to prevent FO entry.
- d. Use of screens over exposed openings when appropriate, e.g., intakes, exhausts, etc.
- e. Installation of special access panels, ports, etc., for inspection and cleanout of FO that could potentially cause damage.
- f. Installation of devices to divert migrating FO from critical mechanisms or components to special access areas for removal.
- g. Use of fasteners with positive locking mechanisms in areas where high vibration levels are expected, or where separation of the fastened item could result in potential damage.
- h. Use of blind fasteners in critical areas, e.g., fuel cells, that are not prone to leaving debris upon extraction.
- i. Use of fasteners with self-retaining features capable of withstanding flight loads to secure high usage access panels.

MIL-STD-980

j. Elimination of potential FO built into equipment such as nameplates that can separate under dynamic loads anticipated.

k. Locating service points, grounding points, built-in test equipment, etc., in areas which are least FOD-sensitive.

l. Use of compatible metals and seals to prevent accelerated deterioration and subsequent spalling of the seal material.

m. Use of conformal coating as a positive seal against entry of minute FO, including dust and water vapor.

n. Procedures shall include provisions for FOD incident feedback to manufacturing engineering and quality assurance for review and appropriate corrective action.

o. Consideration should be given to airfoil designs which can ingest FO without sustaining damage requiring replacement, and rotor designs which allow replacement of individual damaged airfoils. Where integral blade/disc designs are required, repair of individual damaged airfoils should be feasible.

p. Aircraft inlets should be designed to minimize traps where water can collect and freeze. Inlets should be easily plugged and completely sealed against water when plugged. Where the potential for water/ice accumulation exists, continuous water drain provisions should be incorporated.

20.2 Inspection. In those instances where critical FO could exist but cannot be eliminated or effectively sealed without an adverse effect upon overall design integrity or cost, the contractor shall identify and include all necessary inspection points in the manufacturing work instruction and subsequent Technical Orders, Technical Manuals and other appropriate directives.

APPENDIX B
CONTROL OF DEBRIS DURING MAINTENANCE/MANUFACTURING OPERATIONS

10. SCOPE.

10.1 Scope. This appendix established the requirements for control of debris during maintenance/manufacturing operations and is mandatory when specified in the contract.

20. REQUIREMENTS.

20.1 General. The contractor's program for FOD prevention shall include a disciplined approach to manufacturing processes (including testing) for the control of contamination and debris. As a minimum, the program shall address storage and handling of materials, work instructions, process instruments, tool control, parts control, and good housekeeping practices. A contractor shall identify a focal point within his organization as being responsible.

20.2 Storage and Handling. Procedures for storage and handling of materials and hardware components used in fabrication, assembly and test processes shall include measures for protection against contamination or damage from time of receipt until the finished product is delivered. These measures shall include, but are not limited to, the following as applicable:

- a. Upon initial receipt of materials and components, inspect the items for contamination, damage, and assure that they are clearly and properly identified.
- b. Assure that corrosion control measures are implemented as required.
- c. Assure that open fittings or open ends of tubes, valves, pumps, air ducts and fluid-carrying items are protected with approved closures.
- d. Cap or otherwise protect exposed threads and fittings.
- e. Protect equipment items from exposure to physical, chemical, or environmental damage.
- f. Conduct scheduled inspections of stockrooms and stockbins to assure that these areas are clean and free of foreign materials.
- g. Assure that approved protective devices for materials and components are properly installed before storage and prior to movement.
- h. Assure that material, equipment items, assemblies, etc., are moved with proper transportation and handling equipment, and that this equipment is clean and free from extraneous debris.

MIL-STD-980

20.3 Maintenance/Manufacturing Controls. The contractor shall plan and sequence maintenance/manufacturing tasks to preclude foreign object entrapment and product contamination. Documents shall contain necessary processes and procedures for controlling contamination and debris during fabrication and assembly operations. As applicable, the following shall be included in work instructions:

a. Upon completion of final machining operations, clean or flush the machined component to assure that it is free of debris and immediately cap or seal exposed openings to deny foreign object entry.

b. Adequately protect hardware from splatter accumulation during brazing, soldering, welding, and like operations.

c. Inspect components and equipment for damage, repair as necessary, and remove objects and damage before installation.

d. Verify that required protective devices (e.g., dust covers, temporary seals, cushioning, etc.) are present and properly installed. Items with protective devices missing are to be cleaned of FO, repaired if necessary and protective devices installed.

e. After fluid and pneumatic system lines and tubings are cut and deburred, initiate a positive cleaning operation and cap ends of lines. After installation and system servicing, check fluids for contamination. If contamination is present, accomplish corrective decontamination and cleaning actions.

f. Inspect for and remove extraneous material during assembly operations. Upon completion of each major assembly, conduct a foreign object inspection and remove debris. Record the accomplishment of all foreign object inspections.

g. Install protective covers on components, major assemblies, and equipment sensitive to damage or foreign object contamination during follow-on maintenance/manufacturing operations. Assure that protective covers and closures remain in place during subsequent assembly processes except for those periods when removal is required for a specific work effort.

h. Conduct a foreign object inspection of all closed areas as well as all FO entrapment compartments and migratory routes prior to final sealing. Quality Assurance/Control approval must be obtained prior to closing inaccessible areas and compartments, and an inspection seal must be affixed to the area in such a manner that reentry would be indicated. If subsequent access should be required, Quality Assurance/Control shall reinspect prior to closing the areas, compartments, and routes as indicated herein.

i. Prior to movement of the assembly or subassembly, conduct a thorough inspection for damage and debris and correct deficiencies.

j. Inspect production tooling (jigs, fixtures, handling equipment, etc.) to assure it is clean, undamaged, and free of foreign material prior to installation and build-up of components and assemblies. Exercise this same care for work stands, ladders, special test equipment, etc., which must be placed on and around production hardware to accomplish specific work tasks.

k. Manufacturing support equipment such as slave units or samples shall be adequately marked for identification.

l. Bin stock shall be segregated by part number.

m. Provide covered FO containers in strategic locations in maintenance areas. These containers shall be emptied at regular intervals to prevent overfilling.

20.4 Inspection. In all those instances where critical FO could exist, but cannot be eliminated or sealed without an adverse effect upon overall design integrity or cost, contractor inspection, manufacturing, and engineering personnel shall make provisions for appropriate inspection. The contractor shall identify and include all necessary inspection points in the manufacturing work instructions.

APPENDIX C
PREVENTION OF FOD DURING ENGINE TEST CELL ACTIVITIES

10. SCOPE.

10.1 Scope. This appendix establishes the requirements for prevention of FOD during engine test cell activities and is mandatory when specified in the contract.

20. REQUIREMENTS.

20.1 General. When products are tested in a test cell environment, contractor FOD prevention procedures shall include but not be limited to the following:

- a. Assurance that adequate preventive maintenance is performed on the test facility.
- b. Inspection of the test cell and facility equipment for deterioration and damage and assurance that deficiencies which present a FOD hazard are corrected prior to test cell operations.
- c. Inspection of the area before introduction of the test article to the test environment to be sure that it is clean, that hand tools are secured, that required fixtures, dollies and special test equipment are properly prepared and secured, and that required protective devices (engine inlet screens, covers for engine components and instruments, etc.) are on hand, clean, and undamaged.
- d. Visual inspection of the test article before it is placed in the test cell, removal of loose objects, and installation of the necessary protective devices.
- e. Assurance that test cell equipment, tools and accessories are maintained and used in a manner to protect test article from damage or contamination through tool abuse or in-use failure (clipping, cracking, peeling, fraying, etc.).
- f. Verify that gas turbine engines/compressors and test cell fuel/oil filters are clean/uncontaminated and that engine/compressor strainers, filters, and sump plugs are clean/uncontaminated.
- g. Prior to start, visually inspect intake/exhaust areas for potential contamination and rotate the engine through sufficient revolutions to ascertain if there is unusual noise or binding condition. Instrumentation lines, hoses, and wires shall be taped or clamped to eliminate vibratory failure. Use of lockwire or cotter pins for this purpose is prohibited. Following test, all filters, strainers, and sump plugs shall be checked for contamination and the engine shall be borescope inspected in accordance with the applicable engine work instructions/technical data.

MIL-STD-980

h. Upon completion of each test article run and prior to removal from the test cell, inspect test article for presence of FO damage, and install protective cover.

i. Postponement of test article runs when damage is found until the source of damage has been identified, disposition of damage is properly concluded, and corrective action has been taken.

APPENDIX D
PREVENTION OF FOD DURING FLIGHT LINE
MAINTENANCE/LAUNCH OPERATIONS

10. SCOPE.

10.1 Scope. This appendix establishes the requirements for prevention of FOD during flight line maintenance/launch operations and is mandatory when specified in the contract.

20. REQUIREMENTS.

20.1 General. FOD prevention procedures which shall be observed by the contractor during flight line maintenance and launch activities, shall provide

- a. Assurance that personnel working in or passing through these areas:
 - (1) Are made aware of the need to keep these areas clean.
 - (2) Are instructed to pick up all loose objects and foreign objects and properly secure/dispose of them.
 - (3) Report all observed potential FOD conditions to immediate supervisors for further management action when such conditions cannot be corrected on the spot.
- b. Inspection of maintenance stands or special test equipment for damage and removal of debris and loose objects prior to use.
- c. Proper inspection and cleaning of the aerospace vehicle and surrounding area subsequent to a given maintenance task and place all hardware residue, cleaning rags, etc., in appropriate receptacles.
- d. Properly plugging or capping aerospace vehicle openings, ports, lines, hoses, and ducts to prevent entry of foreign objects into vehicle systems and assure that these devices will remain in place at all times, except when removal is required for maintenance access (i.e., entry of engine intakes and tail pipes).
- e. Inspection of removed aerospace vehicle panels for damage and removal of all foreign debris prior to reinstallation. Procedures must require that care be exercised during installation to assure that fasteners are adequately tightened, but not broken, and that damaged fasteners are replaced immediately upon discovery.
- f. Proper use of inlet duct run-up screens during ground run of gas turbine engines. Inspect screens for damage and clean them prior to each use and again after each engine run.

MIL-STD-980

g. Prior to engine ground runs, nonessential equipment shall be removed from the area and secured, and assurances made to prevent exhaust and prop blast damage to other aerospace vehicles or equipment.

h. Prohibition of personnel working near operating engines from wearing loose items of clothing or personal equipment which could be drawn into intake ducts.

i. Planned inspections for damage and periodical cleaning of aircraft parking ramps, taxiways, trim pads, runways, equipment, and storage areas.

j. Reporting of damaged paving in aircraft parking areas and taxiways to the facility manager (or local base or airfield civil engineering authority) for immediate repair.

k. Reporting of aerospace vehicle FOD to immediate supervisors.

l. The conduct of an engine FO inspection before and after each engine run and after each flight.

m. Inspection for and removal of ice accumulation from aircraft inlets prior to engine start.

20.2 Physical Entry. When physical entry is required for maintenance or inspection of engine intake and exhaust areas, assure removal of all loose objects, badges, etc., from clothing. Pocketless coveralls (bunny suits) or equivalent will be worn by inspection personnel to preclude foreign objects dropping from pocket into an area where damage could result.

20.3 Lost Items. Any time an item is lost during performance of a maintenance task, cease activity in the affected area of the aerospace vehicle(s) involved and initiate a search for the item. Continue this search until the item is found or adequate assurances are made that the item is not contained in the aerospace vehicle. Searching for such items may require depaneling and detailed nondestructive inspection techniques, including borescope and/or x-ray. If an item cannot be located after a search has been completed, annotate the vehicle's forms (maintenance records) with a description of the situation and search procedures followed.

20.4 Taxiing. All aircrew and maintenance personnel responsible for taxiing aircraft will be instructed to be aware of FOD hazards involved with aircraft inlet and exhaust blast when taxiing in close proximity to other aircraft and when operating engines are overhanging areas adjacent to ramps and taxiways.

APPENDIX E
INVESTIGATION AND REPORTING OF FOREIGN OBJECT
DAMAGE (FOD) INCIDENTS

10. SCOPE

10.1 Scope. This appendix establishes the requirements for investigation and reporting of FOD incidents and is mandatory when specified in the contract.

20. REQUIREMENTS.

20.1 General. All incidents of FOD will be investigated by the contractor. When a FOD incident occurs, the contractor shall immediately cease operations and activities being performed on or with the damaged component or equipment items, notify the Government Contract Administration Office of the shutdown, and obtain approval to initiate an investigation to determine the cause of the damage. When the investigation is completed and necessary corrective action has been implemented in accordance with MIL-Q-9858, MIL-I-45208, or other contract quality and inspection requirements, rework or scrap (MIL-STD-1520), as appropriate. With ACO approval, the item can be released prior to completion of the investigation and corrective action.

20.2 Incident Report. When FOD occurs during operation, modification, maintenance, or repair of government property, the contractor shall immediately advise the government property administrator and follow up with the formal FOD incident report in accordance with DID DI-R-7101.

20.3 Documentation. Documentation of FOD incidents shall be maintained so that trends, repeats, unusual conditions, etc., can be identified and corrective action can be initiated.

20.4 Disposition of FO. At the start of maintenance, modification, or repair of government property, all foreign objects found in critical areas by the contractor during receiving inspection will be retained pending disposition instructions from the Administrative Contracting Officer (ACO). The government Quality Assurance Representative (QAR) will be notified regarding type of foreign objects found and location where found.

APPENDIX F
FOREIGN OBJECT DAMAGE (FOD) PREVENTION TRAINING

10. SCOPE.

10.1 Scope. This appendix establishes the requirements for FOD prevention training, and is mandatory when specified in the contract.

20. REQUIREMENTS.

20.1 General. Primary objectives of the FOD prevention training program will be to increase employee awareness of the causes and effects of foreign object damage, and to promote active employee participation in eliminating causes during performance of daily work routines. The contractor shall emphasize FOD prevention through employee motivational programs as well as conducting training courses to emphasize FOD prevention through efficient design, product discipline, maintenance, flight line, and launch activities.

20.2 Employee Participation. The contractor shall establish a continuing training program for FOD prevention requiring participation by all employees associated with design, reliability, manufacture, quality assurance, repair, overhaul, refurbishment, acceptance, operation, and maintenance of the aerospace product. New and rehired employees in the above areas shall receive FOD prevention indoctrination as part of their initial job orientation. Objective evidence of all FOD training accomplished shall be maintained and made available for government representative review.

20.3 Training Program. The following subject matter shall be included as applicable in the contractor's FOD prevention training program:

- a. Proper storage, shipping, and handling of material and component or equipment items.
- b. Control of manufacturing debris in the performance of work assignments.
- c. Cleanliness in work areas (housekeeping).
- d. Cleaning and inspection of components and assemblies.
- e. Proper control/accountability and care of tools and hardware.
- f. Control over personal items and equipment.
- g. Proper care and use of assembly and equipment protective devices.
- h. Proper care and protection of completed end items.
- i. Pride of workmanship.
- j. Continual vigilance for potential sources of hazardous foreign objects.
- i. How to report FOD incidents or potential incidents.

APPENDIX G
FOREIGN OBJECT DAMAGE (FOD) PREVENTION FOCAL POINT

10. SCOPE.

10.1 Scope. This appendix establishes the requirements for a FOD prevention focal point and is mandatory when specified in the contract.

20. REQUIREMENTS.

20.1 General. The contractor shall designate a Foreign Object Damage Prevention Focal Point(s) that will develop and implement plans and programs to prevent hardware damage during associated design, manufacturing, assembly, test, acceptance, packaging, handling, storage, transporting, maintenance, flight line, and launch operations. The focal point(s) will be appointed by the chief contractor operating official and shall have sufficient authority and organizational freedom to identify and implement FOD preventive measures whenever and wherever required.

20.2 Details. The focal point(s) will:

a. Review and assess the contractor's FOD prevention program and make necessary revisions.

b. Conduct scheduled audits of work areas to assess effectiveness of the FOD prevention program.

c. Assure implementation of corrective actions for FOD prevention throughout the contractor's organization.

d. Require investigations and studies by other contractor organizations necessary to define preventive measures which shall result in elimination of potential FOD hazards.

e. Assure that FOD incidents are thoroughly investigated and that incident reports are accomplished as specified in Appendix E, para 20.2 of this standard.

f. Assure that causes of FOD incidents are thoroughly analyzed to define essential corrective measures.

g. Notify affected contractor organizations and personnel of unique FOD prevention requirements.

h. Develop techniques and assign responsibilities for publication of special FOD prevention instructions.

i. Review results of the FOD incident investigations and evaluate adequacy of corrective actions.

MIL-STD-980

j. Evaluate the amount and kind of foreign objects found and how they were found (e.g., during daily contractor or government Quality Assurance and safety observations, planning operations, or foreign object audits).

k. Review and approve FOD prevention training curricula, designate training personnel, and assure that contractor personnel receive required training.

l. Assure that written procedures provide for adequate records attesting to the current status and adequacy of the FOD prevention program.

APPENDIX H
TOOL ACCOUNTABILITY AND HARDWARE CONTROL

10. SCOPE.

10.1 Scope. This appendix establishes the requirements for tool accountability and hardware control and is mandatory when specified in the contract.

20. REQUIREMENTS.

20.1 Tool Accountability. The contractor shall establish procedures for ensuring accountability of all contractor and/or personal tools at the start and finish of each maintenance task. Examples of procedures are: use of shadow boards, canvas layouts with tool pockets, tool counters, or composite tool kits. However, the method selected must be effective in timely identification of lost or missing items.

20.2 Hardware Control. Effective methods must be established for control of loose hardware such as nuts, bolts, screens, cotter pins, rivet heads, etc. Excessive hardware over and above that required to perform specific maintenance tasks should not be taken aboard aerospace vehicles. Maintenance/manufacturing debris must be removed at designated intervals. Under normal conditions this should be accomplished upon completion of a specific operation. However, it must be accomplished not later than completion of each eight (8) hour shift.

FOLD

DEFENSE LOGISTICS AGENCY



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

BUSINESS REPLY MAIL

FIRST CLASS

PERMIT NO. 4000

WASHINGTON D. C.

POSTAGE WILL BE PAID BY THE DEFENSE LOGISTICS AGENCY

DEFENSE LOGISTICS AGENCY
Quality Assurance Management Support Office
805 Walker Street
Marietta, Georgia 30060



FOLD

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS: This form is provided to solicit beneficial comments which may improve this document and enhance its use. DoD contractors, government activities, manufacturers, vendors, or other prospective users of the document are invited to submit comments to the government. Fold on lines on reverse side, staple in corner, and send to preparing activity. Attach any pertinent data which may be of use in improving this document. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity. A response will be provided to the submitter, when name and address is provided, within 30 days indicating that the 1426 was received and when any appropriate action on it will be completed.

NOTE: This form shall not be used to submit requests for waivers, deviations or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

DOCUMENT IDENTIFIER (Number) AND TITLE

MIL-STD-980, Foreign Object Damage (FOD) Prevention in Aerospace Products.

NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER

☐ VENDOR ☐ USER ☐ MANUFACTURER

1. ☐ HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? ☐ IS ANY PART OF IT TOO RIGID, RESTRICTIVE, LOOSE OR AMBIGUOUS? PLEASE EXPLAIN BELOW.

A. GIVE PARAGRAPH NUMBER AND WORDING

B. RECOMMENDED WORDING CHANGE

C. REASON FOR RECOMMENDED CHANGE(S)

2. REMARKS

SUBMITTED BY (Printed or typed name and address — Optional)

TELEPHONE NO.

DATE