BY ORDER OF THE COMMANDER
AIR FORCE MATERIEL COMMAND

AFMC INSTRUCTION 21-122

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Maintenance

FOREIGN OBJECT DAMAGE (FOD) AND DROPPED OBJECT PREVENTION (DOP) PROGRAM

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements AFPD 21-1, *Air and Space Maintenance.* It provides policy and guidance for implementing and maintaining a Foreign Object Damage and Dropped Object Prevention (FOD/DOP) awareness and prevention program within all AFMC, ALCs, and AMARC, including contracted services. Maintain and dispose of records created as a result of prescribed processes in accordance with (IAW) Air Force Records Disposition at **https://webrims.amc.af.mil**. Local supplements to this instruction will be sent to HQ AFMC/LGP before publication. HQ AFMC/LGP will reply with a formal memorandum after receipt and review of local supplement. Local supplements will be developed or updated for implementation within 180 days from the publication of this instruction.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

This instruction revises AFMCI 21-122, *Foreign Object Damage Awareness and Dropped Object Prevention Program*. It changed applicability from all AFMC units to ALCs and AMARC. It identifies program management and reporting procedures for FOD and Dropped Objects. This is a complete re-write.

Chapter 1

GENERAL POLICY

1.1. Introduction. HQ AFMC Depot Maintenance Division **(**HQ AFMC/LGP) provides policy and general program guidance for establishing and monitoring ALC and AMARC FOD/DOP Programs. The objective of this program is designed to eliminate the introduction of any foreign object that could damage an aircraft, aerospace component, or aerospace support equipment operated at ALCs and AMARC. This instruction establishes minimum requirements for an effective center FOD/DOP program. FOD/DOP will be an integral part of all AFMC Quality Assurance Programs.

1.2. Applicability Statement. This instruction applies to all personnel in AFMC ALCs and AMARC, to include contracted services that work in, on, around or travel through areas near operational and production aircraft, engines, munitions, missiles, drones, space systems, support equipment, aerospace ground equipment (AGE), trainers or components thereof. This includes ALC and AMARC personnel operating vehicles and equipment on AFMC flight lines, runways, taxiways, parking ramps, and in aircraft hangars or maintenance areas. It also applies to all activities and contractors assigned to the ALC and AMARC that test, design or operate aircraft, aerospace components, aerospace support equipment, organizations or shops supplying parts or equipment that will be installed or attached to an aircraft or related equipment. It also applies to Defense Contract Management Agency (DCMA) managed units that possess AFMC assigned aircraft. It points out some causes of FOD/DOs, methods of prevention and establishes investigation and reporting requirements for FOD/DO mishaps. It explains the FOD/DOP program and training requirements.

NOTE: Recommended changes to this instruction will be forwarded to HQ AFMC/LGP.

1.3. Supplemental Directives. ALC and AMARC vice commanders or designated representative will publish a local directive to supplement the minimum requirements in this instruction with detailed guidance and procedures to ensure an effective center FOD/DOP program is established. Supplemental directives will identify all maintenance and production areas that are considered high-potential foreign object (FO) areas.

NOTE: Local directives will outline organizational responsibilities for AFMC flight lines, runways, taxiways, parking ramps and outside maintenance areas shared between the host base (e.g. Air Base Wing [ABW]) FOD/DOP manager and the ALC and AMARC Center FOD/DOP officer.

1.4. Types of FO Areas. There are two types of FO areas; high-potential and low-potential.

1.4.1. High-potential FO areas are maintenance areas where on-equipment aircraft maintenance, jet engine maintenance, fuel cell maintenance, and major sub-assembly maintenance (e.g. struts, wings, flight controls, and gears) are performed, and any other high FO potential areas designated by the MA or Deputy MA in writing.

1.4.2. Low-potential FO areas are all other aircraft maintenance areas not defined in paragraph **1.4.1.**

1.4.2.1. All non-maintenance areas at the centers are considered non-FO areas.

1.5. Forms. Locally devised forms for reporting FOD/DO incidents will not be used without the approval of HQ AFMC/LGP for ALCs and AMARC.

Chapter 2

FOD/DOP PROGRAM

2.1. Program Objective. The objective of the center FOD/DOP Program is to eliminate sources of FOs and root causes of DOs. A FOD/DOP Program improves readiness and saves lives, material, manpower, and money. All units, which fly, service, or maintain aircraft, will develop a FOD/DOP program. The FOD and DOP programs may be managed separately, but are normally one central program, managed by a single center FOD/DOP officer.

2.2. Command FOD/DOP Manager. The Command FOD/DOP Manager is located in HQ AFMC/LGM and:

2.2.1. Provides quarterly and annual consolidated FOD/DOP data to wing and center FOD/DOP monitors.

2.2.2. Conducts annual AFMC FOD/DOP meeting.

2.2.3. Clarifies policy and assists units in resolving FOD/DOP issues.

2.2.4. Works with other MAJCOM FOD/DOP managers to resolve FOD/DOP issues between the Centers and owning commands.

2.2.5. Notifies lead command of FOD/DOP incidents to consolidate fleet wide data for identification of problems and provides information for all users.

2.2.6. Acts as MAJCOM OPR for all dropped object field inquiries.

2.3. Center FOD/DOP Officer. The center vice commander or designated representative appoints a center FOD/DOP officer and alternate in writing. The center FOD/DOP officer:

2.3.1. Will be at least a technical sergeant (TSgt) possessing a 2A373, 2A571 or 2A671A/B Air Force Specialty Code (AFSC), civilian equivalent specialty, (contractor if designated by performance work statement) or officer (maintenance or safety background) and will be assigned on a full time basis, reporting directly to the center vice commander. Civilian equivalent will have at least one year background experience in a maintenance field or safety and be knowledgeable of FOD/DOP procedures and policies. Develop a local visual aid with center FOD/DOP officer and alternate's name and point of contact information. Visual aid should have areas to add directorate, division and branch FOD/DOP focal points information. Distribute visual aids to the Directorate, Division and Branch FOD/DOP focal points.

2.3.2. Develops local directive to supplement minimum requirements in this instruction and administers the center FOD/DOP program.

2.3.3. Ensures all incidents of center's FOD/DOs are reported according to **Chapter 4**.

2.3.4. Reports all center FOD/DO incidents to HQ AFMC/LG within 24 hours of occurrence.

2.3.5. Coordinates with Center Safety and appoints a team of appropriate personnel to investigate each incident of FOD/DO not reportable under AFI 91-204. At least one member of any FOD investigation team should be trained in jet engine FOD investigation procedures (if applicable). This team submits a report to the FOD/DOP officer.

2.3.6. Provides FOD/DOP items of interest to all subordinate FOD/DOP focal points.

2.3.7. Reviews all center FOD mishaps and analyzes the reports and other data for trends that identify areas requiring management action.

2.3.8. Develops and presents FOD/DOP committee meeting agenda at the quarterly center FOD/DOP Awareness and Prevention Committee meeting, (monthly if deemed necessary by the center vice commander or designated representative). Ensures meeting minutes are published and distributed to the center vice commander and each committee member.

2.3.9. Attends the annual command FOD/DOP meeting, should attend the Annual National Aerospace FOD Prevention Conference and the Jet Engine Mishap Investigation Course.

2.3.10. Promotes program awards, incentives and publicity.

2.3.11. Reports and coordinates any known or suspected FOD/DO occurring on the flight line, runway, taxiway or parking ramp to the host base (e.g. ABW) FOD/DOP manager.

2.3.12. Coordinates FO prevention needs with the airfield manager and other agencies when construction is in progress on or near maintenance areas or other areas where FOD incidents could occur.

2.3.13. Informs all center agencies of FOD hazards.

2.3.14. Monitors and recommends changes, as required, to FOD/DOP awareness and prevention training.

2.3.15. Periodically inspects and reports damaged pavement, construction, or other hazards in or near maintenance areas to the airfield manager and monitors status to ensure timely repairs.

2.3.16. Attends the host base (e.g. ABW) FOD/DOP prevention committee meeting.

2.3.17. Develops standard FOD/DOP continuity book requirements for all FOD/DOP focal points. Develops continuity book standard that permits a newly appointed person to comply with existing policy and procedures with minimal assistance. These requirements will be outlined in a local supplement.

2.4. FOD Prevention Focal Points. Each director, division chief, and branch chief in a maintenance function appoints a FOD/DO Prevention Focal Point for their organization. The FOD/DOP Focal Point:

2.4.1. Should be at least a Staff Sergeant (SSgt) possessing a 2A353, 2A551 or 2A651A/B AFSC, or civilian aircraft maintenance background, (contractor if designated by performance work statement). A civilian will have at least one year background experience in a maintenance field and be knowledgeable of FOD/DOP procedures and policies. Post visual aid provided by the center FOD/DOP officers (see paragraph **2.3.1.**) in prominent places within work centers.

2.4.2. Provides FOD/DOP information to FOD/DOP focal points in subordinate organizations (i.e. the directorate focal points sends information to the division focal points, division focal points send information down to the branch focal points, etc.)

2.4.3. Conducts periodic FOD spot checks and reports observations to the first line supervisor of the area of responsibility and to the division quality organization (do not enter in the Quality Information Management Standard System). Specify the frequency of FOD spot checks by each focal point in the local FOD/DOP supplement.

2.4.4. Attends center FOD/DOP Program Committee Meetings. Directorate and division focal points as a minimum, will attend.

2.4.5. Contacts center FOD/DOP officer on all FOD/DOP related issues within 24 hours of occurrence (FOD/DOP focal points will up channel all information through the next higher FOD/DOP focal point until the center FOD/DOP officer is notified).

2.4.6. Assists supervisors in developing FOD/DOP awareness and prevention briefings.

2.4.7. Maintains/creates FOD/DOP continuity book based on local supplement.

2.4.8. Reviews MAPQ Annual Technical Compliance Review (TCR) for adverse negative trends and makes recommendations to the center FOD/DOP officer.

2.5. Newly assigned FOD/DOP Officer and Focal Points. Newly assigned FOD/DOP officer and focal points will:

2.5.1. Review all applicable FOD/DOP program instructions, supplements and HQ AFMC Logistics Standardization and Evaluation Team (LSET) FOD/DOP checklist. Validate locally developed self-inspection checklists within 30 days of assignment of duties. Ensure current and updated reference materials are available.

2.5.2. Review and validate FOD/DOP program continuity books. Develop and maintain program continuity if not made available at time of assignment. Continuity programs depict procedures for accomplishing tasks associated with each duty position. Develop continuity book IAW local supplement.

2.5.3. Complete all training requirements IAW para **2.7.** and **2.8.**

2.5.4. Contact command FOD/DOP program manager for additional assistance if needed.

2.6. Center FOD/DOP Program Committee. The center vice commander or designated representative is the chairman. As a minimum, the committee will meet on a quarterly basis or monthly if deemed necessary by the center vice commander. Center FOD/DOP officer ensures meeting minutes are published and distributed to the center vice commander and each committee member. Ten workdays is the standard for distribution of meeting minutes.

2.6.1. The center FOD/DOP Program Committee chairperson makes the final determination on committee membership. As a minimum, the following activities will provide a representative:

2.6.1.1. Center FOD/DOP officer, director and division FOD/DOP focal points.

2.6.1.2. Center Safety.

2.6.1.3. Center Maintenance Training.

2.6.1.4. Directors, division and branch chiefs, or equivalent, as applicable.

2.6.1.5. Directorate and Division QA representatives.

2.6.1.6. Aircraft maintenance and back shop representative (define required attendance in local supplement).

2.6.1.7. Flight test representative.

2.6.1.8. Contracting, as applicable.

2.6.1.9. Center, directorate and division tool control managers.

2.6.1.10. Center, directorate and division flight line driving program managers (Vehicle Control Officer/Vehicle Control Non-commissioned Officer).

2.6.2. As a minimum, the Center FOD/DOP Program Committee's agenda will include:

2.6.2.1. Status of actions on items from previous meetings. Action items are carried in an "open" status until all actions or corrections are closed out or completed.

2.6.2.1.1. Include action items from the host ABW FOD/DOP Committee meeting.

2.6.2.2. All center FOD/DO occurrences since last meeting. Break out data per mission design series (MDS) and similar to **Chapter 4** quarterly reporting procedures.

2.6.2.3. FOD/DO metrics showing cumulative FOD/DOP data and trends from the beginning of the fiscal year (FY).

2.6.2.4. Customer reported FO, FOD and DO on aircraft, missiles, drones, engines or other components and equipment processed at any AFMC facility.

2.6.2.5. Assignment of specific actions and responsibilities.

2.6.2.6. FOD/DOP program status, improvements, recommendations, motivation or suggestions, including initiatives and suggestion reviews.

2.6.2.7. FOD/DOP program awards and publicity.

2.6.2.8. Tool control and accountability issues, to include lost tool reports, lost item reports and recoverability percentages.

2.6.2.9. Lessons learned from other MAJCOM, base, centers and unit FOD/DOP program committees.

2.6.2.10. Show-and-tell items of interest, if applicable (i.e. FOD damage, FO found during FOD walks, dropped objects, etc.)

2.7. FOD Awareness and Prevention Training. Conduct and document initial and refresher (annual) FOD awareness and prevention training for all personnel who work in or travel through maintenance areas (see AFMCI 21-108, *Maintenance Training and Production Acceptance Certification (PAC) Program*). OO-ALC, Hill AFB, UT, is the lead center for developing and updating the ALC/AMARC FOD/DOP training.

2.7.1. Initial Training. Initial training will consist of formal classroom training. Use course number MHPMAS00001300, *Foreign Object Damage (Initial)*. Personnel will receive initial FOD awareness and prevention training within 30 days of assignment to the work center.

2.7.2. Refresher Training. Refresher training is required annually (not to exceed 12 months). Use course number MPHMAS00001301, *Foreign Object Damage (Refresher)*.

2.7.3. Develop local training related to local procedures, requirements and directives and include in the initial work center supervisor briefing (see paragraph **2.9.1.**). Centers with several types of aircraft assigned and possessed (i.e. programmed depot maintenance [PDM] aircraft) will have all aircraft incorporated into one center training program. Ensure training emphasizes the following minimum FOD awareness and prevention subjects:

2.7.3.1. Procedures unique to the assigned and possessed aircraft.

2.7.3.2. Availability and location of FOD containers, bags and other housekeeping equipment.

2.7.3.3. Lessons learned, common causes of FOD and those which are peculiar to the MDS, other major end items, support equipment, engines or components assigned to or serviced by the organization.

2.7.3.4. Hardware and tool control and accountability policies for end of task, end of shift, and transfer at work site as prescribed in AFMCI 21-130, *Equipment Maintenance Materiel Control* and AFMCI 21-107, *Tool Control and Accountability Program*.

2.7.3.5. Individual responsibilities to prevent FOD.

2.7.3.6. Local backshop, flight line, taxiway, aircraft parking ramps and hangar work area FOD policies.

2.7.3.7. Signs and symptoms of FOD mishaps with brief engine abnormalities and no accompanying external or cockpit indications.

2.7.3.8. FOD reporting procedures.

2.7.4. Develop local procedures to ensure newly assigned structural repair technicians are trained and certified on engine intake/inlet maintenance (i.e. rivet replacement, taping procedures, etc.). Include work order residue control procedures.

2.8. DOP Awareness and Prevention Training. Conduct and document initial and refresher (annual) DOP awareness and prevention training for all maintenance personnel as outlined in para **2.7.1.** and **2.7.2.** (see AFMCI 21-108*)*. DOP training will be conducted and documented in conjunction with FOD training. Conduct initial DOP awareness and prevention training within 30 days of assignment to the work center. Refresher training is required annually (not to exceed 12 months).

2.8.1. DOP Awareness Training. All on-equipment and maintenance production personnel will receive initial and refresher (annual) DOP awareness training. As a minimum, include the following DOP awareness training subjects:

2.8.1.1. General overview of DOP program to include definition of DO, examples of causes and preventive actions.

2.8.1.2. Proper DO reporting procedures.

2.8.2. DOP Prevention Training. In addition to DOP awareness training, all ALC on-equipment maintenance personnel assigned to final assembly, flight line operations and flight test will receive adequate initial and refresher (annual) DOP prevention training. As a minimum, include the following DOP prevention training subjects:

2.8.2.1. Inspection, installation and removal procedures per MDS (as applicable) for aircraft panels, doors, access covers, cowlings, etc.

2.8.2.2. Care of panel latches, fasteners, nut plates and other locking devices.

2.8.2.3. Security of hardware, particularly those causing a high rate of DO incidents.

2.9. Supervisor Briefings.

2.9.1. Initial work center briefings. Supervisors will brief newcomers on work center specific FOD/DO awareness and prevention practices prior to starting work. Work center FOD/DO brief will be documented per local supplements. Ensure individuals TDY, transferred or loaned from another unit receive a work center FOD/DO briefing prior to beginning work in that area.

2.9.2. Quarterly briefings. Supervisors will brief maintenance personnel working in or around on-equipment, production aircraft, other major end items, support equipment, engines or components on FOD/DO awareness and prevention. Document these briefings and ensure all personnel that were briefed either sign or initial on a locally developed attendance roster. Ensure individuals not present for the briefing receive the briefing when they return. Keep one-year of attendance rosters. Include briefing as part of the unit's periodic news breaks or staff meetings. Include a review of the FOD/DO awareness and prevention committee minutes and any unique requirements of the unit that could affect FOD/DO awareness and prevention, e.g. causes of recent FOD/DO incidents and actions taken to prevent reoccurrence, if applicable.

2.10. FOD/DO Publicity. Publicity is a key element of an effective FOD/DOP Program. Information on posters and other materials to establish and maintain an awareness of the need to prevent FOD/DO can be obtained from the center FOD/DOP officer. Competitive programs in FOD/DO awareness and prevention between organizations, units, branches, sections and shops are strongly encouraged.

Chapter 3

PREVENTING FOD/DO

3.1. General FOD Prevention. There are many causes of FOD. Two major contributors are poor housekeeping and poor work habits such as not accounting for hardware, safety wire, tools, etc., during operations and maintenance. All loose objects, regardless of their origin, can cause catastrophic and costly damage to an aircraft, major end item or loss of life.

3.2. FOD Prevention Practices. FOD awareness and prevention is everyone's responsibility. Adhere to the following minimum FOD prevention requirements:

3.2.1. Escorts of visiting personnel will ensure FOD prevention measures are briefed and taken, where applicable.

3.2.2. Plug or cap all openings, ports, lines, hoses, electrical connections and ducts on aircraft, engines, munitions, missiles, drones, space systems, support equipment, AGE, trainers or components to prevent FO from entering these systems any time maintenance is not being performed (i.e. end of task, end of shift) and IAW applicable technical data.

3.2.2.1. While performing maintenance, use good judgment when it is appropriate to plug, cap and cover openings to prevent FOD. Local directives and tech data may outline stricter controls.

3.2.2.2. Electro-static discharge (ESD) sensitive equipment requires the use of ESD caps IAW Technical Order (TO) 00-25-234, *General Shop Practice Requirements for the Repair, Maintenance and Test of Electrical Equipment*. All unmated connectors that are exposed to physical or environmental damage or in an area where such damage could occur and have the potential to cause FO/FOD, shall be covered with a protective cap. Use good judgment when it is appropriate to cover unmated connectors while performing maintenance. Local directives and tech data may outline stricter controls.

3.2.2.3. Management will make readily available all necessary caps, plugs, covers, etc., for use by maintenance personnel in their immediate work area for the prevention of FOD.

3.2.3. Install intake plugs, FOD strips or tape and barrier paper (as required by technical data and/or local procedures) prior to performing maintenance in or around engine intakes. Cover engine intakes and exhausts any time maintenance is not being performed. Ensure engine inlet run-up screens and anti-personnel guards are used as required by applicable weapon system TOs.

3.2.4. Do not place video tape recorder tapes, checklists or any other foreign objects in or on engine and aircraft intakes.

3.2.5. Inspect each engine intake and exhaust for FO/FOD. Also inspect the ramp area within 25 feet (or greater if required by MDS specific TO) of the intake prior to engine start and after engine shut down, maintenance ground test cell runs and any engine intake/inlet or exhaust maintenance. Document the FO/FOD inspection in the applicable production or aircraft forms. Document FO/FOD inspections performed on uninstalled test cell engines on the test cell worksheet.

3.2.6. Ensure aircraft engine and pitot static covers remain installed on aircraft at all times other than during operation of the aircraft, when performing maintenance or inspections of the areas or as defined by the applicable tech data. Special emphasis is required for items such as remove before

flight streamer attachment, safing pin condition, hinge pin security, dust and FO prevention cover condition, security, aircraft -21 equipment and aircraft forms binder condition. Supervisors ensure these items are periodically checked for FO prevention compliance.

3.2.7. Do not wear hats, berets, badges, wigs, hairpieces, etc., within the danger area of an operating jet engine (as defined in the applicable aircraft-specific TO). Each center will develop local supplement governing the wearing of hats, berets, badges, wigs, hairpieces, etc., in all maintenance areas designated as high FO potential areas. Climate and safety will be considered. Follow host base (e.g. ABW) supplements for the wear of hats, berets, wigs, hairpieces, etc., while on the flight line. Secure applicable restricted area or identification badges to each individual with a nylon or cotton cord or a plastic armband to prevent loss and possible FOD.

3.2.8. All personnel will empty all pockets when performing intake or exhaust inspections. Wear pocketless, zipperless, buttonless coverall or bunny-suit when physical entry is needed to inspect engine intake or exhaust areas. Wear cloth over-booties or stocking feet with boots removed for intakes only. Suits are not required to be worn if personnel do not physically enter these areas. A rubber mat may be used instead of cloth over-booties or boots removed if MDS tech data applicable.

3.2.8.1. All personnel will remove the AF Form 1199, USAF Restricted Area Badge when performing intake or exhaust inspections and/or maintenance if they physically enter these areas.

3.2.8.2. Use a light source of sufficient illumination to inspect the aircraft intakes and exhaust for FO/FOD.

3.2.8.3. Ensure all pockets are emptied and accessories removed when performing intake inspections while wearing a chemical warfare ensemble. Cover all exposed chemical warfare ensemble metal zippers with any type of tape.

3.2.9. Maintain cleanliness of maintenance and manufacturing areas at all times. Keep areas free of FO. A thorough cleanup will be accomplished upon completion of each task and at the end of the shift.

3.2.10. Establish and tailor rivet engine inlet/intake and exhaust replacement procedures for each MDS as applicable. Include work order residue control procedures for all maintenance performed in and around inlet/intake and exhaust areas.

3.2.11. Ensure strict control for all tools, equipment, rags, residue and hardware. Inventory tool kit and applicable equipment prior to any engine start (i.e. installed or uninstalled). Mark Government Furnished Equipment (GFE) tools IAW AFMCI 21-107, *Tool Control and Accountability Program*. Contractors will implement a tool program that as a minimum meets the requirements of AFMCI 21-107. Personal tools are not authorized in any maintenance area or on the flight line (e.g. mini-mag flashlights, leathermans, buck knifes, etc.).

3.2.12. Report damaged pavement in and around aircraft traffic and taxi, towing, run-up, or parking areas to Base Operations immediately upon discovery.

3.2.13. Remove removable clips (not affixed) from flashlights prior to use on or around aircraft, uninstalled engines and AGE.

3.2.14. Grounding wires and points.

3.2.14.1. Use two Allen head screws or equivalent, to secure cable to grounding clips. Remove all unused screws.

3.2.14.2. Keep all grounding points in maintenance areas clean of debris at all times and ensure grounding points are a high interest item for FOD walks.

3.2.15. FOD walks/sweeps are mandatory within aircraft production and flight test areas designated as high potential FO areas and is an option for all other areas. Local supplement will outline frequency and areas of responsibility.

3.2.16. FOD walks will be accomplished prior to towing aircraft through low potential FO areas to ensure damage does not occur to aircraft tires.

3.3. Vehicles and FO Containers.

3.3.1. All center government owned vehicles (GOVs), contractors, privately owned vehicles (POVs) and any other center vehicle operators, will perform a FOD inspection on all towed equipment/vehicle tires and open cargo areas of vehicles prior to entering the runway, taxiway, flight line and aircraft parking ramps and other areas directed by the ABW or center FOD/DOP officer. Coordination between the ABW FOD/DOP officer, center FOD/DOP officer and Airfield Management is required to ensure FOD inspection checkpoints have signs and are clearly marked.

3.3.2. Vehicle operators departing the paved surface will perform a FOD inspection of all equipment and vehicle tires immediately upon re-entering the paved surface of runways, taxiways, flight lines and aircraft parking ramps.

3.3.3. Equip all GOVs having access to these areas with a locally manufactured or commercial available tool for removing debris from tire treads. Identify this tool to the vehicle using the vehicle identification number.

3.3.4. Use of magnetic bars on center GOVs is optional (unless designated by the host base supplement). If used, tow or attach the magnetic bars to selected vehicles used on the flight line. Inspect magnetic bars for FO prior to each shift to ensure bars are FO free. Check with local vehicle maintenance and host base (e.g. ABW) FOD/DOP manager before installing or modifying a magnetic bar.

3.3.5. Install lidded FO containers in all flight line vehicles. Empty all vehicle FO containers when full or at the end of each shift, as necessary. Supervisors will periodically inspect FO containers to ensure compliance.

3.3.6. All maintenance production areas will have approved FO containers highly visible and readily accessible to workers. Stencil “FO” in contrasting colored letters not smaller than 2 inches on all FO containers (It is not necessary to re-stencil FO containers if previously stenciled “FOD”).

3.3.7. The center FOD/DOP officer is the approving authority for the type of container used. Center FOD/DOP officer can authorize small FO collection cans or bags that can be used by personnel when an area collection can is not feasible. Empty all small FO cans or bags when full or at the end of the shift, whichever comes first.

3.4. Wear of Jewelry.

3.4.1. Finger rings and other jewelry will not be worn while performing maintenance on aircraft or ground support equipment, including civil engineering type maintenance. Follow all guidelines for the proper wear of finger rings and other jewelry as outlined in AFOSHSTD 91-100, *Aircraft Flight Line-Ground Operations and Activities,* and the work center job safety analysis IAW AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health Program*.

3.4.2. This prohibition applies only to personnel actually performing work, evaluations or climbing on stands/aircraft and is not intended for administrative and support personnel visiting work areas.

3.5. Rag Control. Rag control procedures will be established for all high potential FOD areas. A high potential FOD area is defined as any maintenance area where on-equipment aircraft maintenance, jet engine maintenance, fuel cell maintenance and major sub-assembly maintenance (e.g. struts, wings, flight controls, and gears) is performed and any other high FO potential areas designated by the MA or Deputy MA in writing. Paragraphs **3.5.1.**, **3.5.2.**, and **3.5.3.** outline the minimum control procedures. The definition of a rag is provided in **Attachment 1**.

3.5.1. Centers will identify all aircraft closures (enclosed flight control cable areas, engine cowlings, egress seat installation, aircraft panels, etc), non-enclosed areas where safety of flight could be compromised, and major component mating operations (aircraft/commodity areas will be identified in the local supplement). These areas will require two-person certification prior to closure or mating to ensure FO free. The center will update all effected Work Control Documents (WCDs) to identify areas requiring an "I" code IAW AFMCI 21-110, *Work Control Documents*. The WCDs will have a definitized list with "Rag/FO inspection C/W."

3.5.1.1. Paper products will not be used in areas with the above procedures.

3.5.2. The following areas will have two-person certification control procedures (one-for-one accountability) established in local supplements: Functional Test Flight area (begins at preparation for -6 preflight), Test Cell, Engine Assembly areas, and In-Tank Fuel Cell Maintenance (includes cheesecloth).

3.5.2.1. A standard rag (ALC/AMARC wide) will be identified in all areas requiring two-person certification control procedures.

3.5.2.2. Do not cut or tear standardized, commercial quality, vendor-supplied shop cloths or rags in order to produce multiple pieces.

3.5.2.3. Do not use clothing or shredded clothing (non-standardized cloths) as rags in these areas.

3.5.2.4. Rags do not include paper products. Do not use paper products in place of rags in high potential FO areas.

3.5.2.5. Rags will be accounted for at the end of every shift unless more restrictive procedures are in the local supplement.

3.5.3. ALCs and AMARC may use control procedures outlined para in **3.5.2.** for high potential FOD areas in lieu of para **3.5.1.** However, all critical closure/safety of flight areas must still be documented IAW standard AFMCI 21-110 procedures.

3.5.4. Paper products of all types may only be used in low potential FOD and general maintenance areas where no closure procedures are required. Use of paper products will be kept to a minimum. Local supplements will identify areas of use.

3.6. Cut Tires. Notify Airfield Management and inspect parking ramp up to the taxi way for possible FO. Airfield management should inspect taxiways and runways for possible FO.

3.7. Cell Phone Use. Local supplements will identify use and control procedures for cell phones.

3.8. DO Prevention Practices. Effective prevention of dropped objects in the ALCs and AMARC starts with the initial assembly area of production aircraft and associated equipment. Supervisors will place special emphasis of the following subjects during on-equipment maintenance, final assembly, flight line operations and flight test areas:

3.8.1. Install and adjust access panels, doors, cowling and components using applicable technical data.

3.8.2. Fastener torquing requirements will be completed with tools or gauges as specified in applicable tech data.

3.8.3. Flight line operations and flight test maintenance personnel will ensure the security of all hardware during aircraft pre-flight and post-flight inspections. Immediately notify the aircraft crew chief or applicable maintenance personnel of aircraft discrepancies that could lead to DO.

3.8.4. Once active aircraft AFTO Forms 781, **Aircrew/Mission Flight Data Document**, are re-established, all maintenance actions will be documented IAW TO 00-20-1, *Aerospace Equipment Maintenance General Policies and Procedures* (including panel open, closures, removal and installation procedures).

3.8.5. Ensure the serviceability of fasteners and proper fit of doors, panels, connectors, etc. Place special attention on the length of fasteners and condition of nut plates and other securing devices.

3.8.6. Security of hardware, particularly those causing a high incidence of DO reports, will be high interest items by flight line operations and flight test maintenance personnel and aircrews during aircraft walk-around.

Chapter 4

FOD REPORTING AND INVESTIGATION

4.1. Initial FOD Incident Reporting Procedures.

4.1.1. Immediately notify the center FOD/DOP officer/alternate when suspected or confirmed FOD is discovered. The center FOD/DOP officer will initially report **all** FOD incidents regardless of cost (other than minor sand nicks or scratches) to Command FOD/DOP manager by telephone, fax or e-mail as soon as the damage is known, but no later than 24 hours after the occurrence, regardless if the FOD incident is reportable under AFI 91-204. This includes FOD incidents discovered during receiving inspection to the ALC or AMARC and discovered during acceptance inspection and testing. If the FOD incident is deemed a mishap IAW AFI 91-204, the center FOD/DOP officer will initially report the FOD incident to HQ AFMC, then work in tandem with the center SE office to properly report the mishap.

4.1.2. The Command FOD/DOP manager is HQ AFMC/LGMM, Defense Switched Network (DSN) 674-0085, commercial (937) 904-0085, fax DSN 986-1352, fax commercial (937) 656-1352. E-mail all initial FOD reports to the AFMC/LG V3 Defense Message System (DMS) mailbox at **mailto:HQAFMC.LG.V3@WPAFB.AF.MIL**.

4.1.3. As a minimum, use the following formal initial FOD incident format:

4.1.3.1. Date and time of incident.

4.1.3.2. Base, unit and location of incident.

4.1.3.3. Owning command and unit.

4.1.3.4. MDS and tail number (for installed engine FOD).

4.1.3.5. Engine type, make, series, modification (TMSM), serial number and installed position (if applicable).

4.1.3.6. Estimated cost of damage (initial report), final cost of damage (final report).

4.1.3.7. Description of damage.

4.1.3.8. Most likely cause of FOD.

4.1.3.9. Action taken to prevent recurrence for preventable FOD.

4.1.3.10. Material failure: (Yes or No).

4.1.3.11. Tech data deficiency: (Yes or No).

4.1.3.12. Preventable or Non-preventable.

4.1.3.13. Disposition of aircraft or engine.

4.1.3.14. Certifying official: Name, Rank, Unit, Office Symbol, DSN and commercial number.

4.1.4. After Hours Reporting. In addition to the aforementioned procedures for initial FOD incident reporting, all ALCs and AMARC will report after hours FOD incidents to HQ AFMC Warfighter Sustainment Division (WSD), DSN 787-5544, commercial (937) 257-5544. E-mail to

mailto:HQAFMC.BS.LG@WPAFB.AF.MIL. WSD will then notify the command FOD/DOP manager per 4.1.1.

4.1.5. Units will maintain FOD reports for 24 months.

4.2. FOD Discovered During Receiving Inspection to the ALC and AMARC. In addition to the initial reporting procedures, the center FOD/DOP officer or designated authority will notify the owning unit no later than 24 hours after the occurrence of all FOD incidents discovered during the receiving inspection to the depot. The Command FOD/DOP manager will notify the owning MAJCOM. The results of the FOD investigation will determine if the FOD discovered during the receiving inspection will be charged to the owning MAJCOM, unit, ALC or AMARC. HQ AFMC and owning MAJCOM FOD/DOP managers will make the final determination. Annotate all evaluated and repaired FOD in applicable work control documents (WCD), AFTO Forms 781, AFTO Form 95, Significant Historical Data and Comprehensive Engine Management System (CEMS) IAW TO 00-20-1. Document all FOD and any previous repaired blends noted during the receiving/induction process and borescope inspections.

4.3. FOD Discovered During Programmed Depot Maintenance/Functional Test (FT). In addition to the initial reporting procedures, the center FOD/DOP officer or designated authority will notify the owning unit no later than 24 hours after occurrence of all FOD incidents discovered during PDM/FT of aircraft, missiles, drones, engines, or components. The Command FOD/DOP manager will notify the owning MAJCOM. Annotate all evaluated and repaired FOD in applicable WCDs/AFTO Forms 781, AFTO Form 95 or CEMS IAW TO 00-20-1.

4.4. FOD Discovered Upon Removing Aircraft from Long-Term Storage at AMARC. A formal FOD report is not required if the FOD was discovered upon removing the aircraft from long-term storage and was annotated in historical records prior to induction to AMARC. In the event FOD is discovered upon removing aircraft from long-term storage and cannot be verified through historical records, the AMARC FOD/DOP officer will provide a courtesy notification of the FOD to the Command FOD/DOP manager. Use the initial FOD reporting format as stated above. The FOD will not be charged against the center's FOD rate.

4.5. FOD Investigation. Investigate each case of FOD to determine the cause and preventive action. Immediately render aircraft, missile, drone, support equipment, engine or component unsafe for use when known or suspected FOD is discovered. The end item will be impounded IAW AFMCI 21-139, Depot Maintenance Impoundment Procedures and local supplements until the FOD investigation is complete. Use expertise in maintenance, safety and other staff agencies as needed.

4.5.1. Center FOD/DOP officer/alternate coordinates with center safety and appoints a team of appropriate personnel to investigate each incident of FOD. If the FOD is mishap reportable, the center safety office will establish the investigation team. Safety investigations take priority over any corresponding investigations. At least one member of any FOD investigation team should be trained in jet engine FOD investigation procedures (if applicable). Center FOD/DOP officer should be involved in the investigation to ensure that corrective actions are sound. The investigation team performs the following actions and submits a report to the center FOD/DOP officer.

4.5.1.1. Use x-ray, borescope and other state-of-the-art equipment to locate FO in an inaccessible area (as applicable).

4.5.1.2. Perform a thorough inspection of the aircraft for missing aircraft components (i.e. screws, rivets, fasteners, etc) for installed engine FOD.

4.5.1.3. Perform a thorough inspection of the run pad or ramp area and within 25 feet of the aircraft intake for FOD damage that occurred during aircraft ground runs.

4.5.1.4. Perform a thorough inspection of the uninstalled engine, test stand, test equipment, etc., for missing components for FOD that occurred at the test facility.

4.5.1.5. Immediately perform a tool kit and equipment inventory upon discovery of the FOD. Review recent Lost Tool/Item Reports for relevance to FOD incident.

4.5.1.6. Use the D043A, Master Item Identification System, supply system to determine costs of parts and pieces when figuring cost of FOD damage. Use **http://afsafety.af.mil/** for labor rates involved in the repair of the FOD damage**.** Contact the Command FOD/DOP manager for further assistance if required.

4.5.1.7. Recommend utilizing a Failure Analysis Service Technology, Inc (FAST) analysis or the center Metallurgical Analysis Section, when applicable, to determine the cause of the FOD. FAST and the Metallurgical Analysis Section use physical and forensic evidence of the damaged component and can determine the type of material of the FO.

4.5.2. Contact the command FOD/DOP manager if owning MAJCOM or unit directs shipment of the damaged engine before the investigation is completed. The command FOD/DOP manager will coordinate the completion of the FOD investigation with the owning MAJCOM or unit.

4.5.3. Locally developed FOD incident investigation checklists should be used to enhance FOD investigations.

4.6. FOD Classifications and Rates.

4.6.1. FOD incidents are classified as preventable and non-preventable. Only preventable FOD incidents over $20,000 (parts and labor) will be charged to the center's FOD incident rate. FOD incidents are considered preventable except those listed below:

4.6.1.1. Caused by natural environment or wildlife including hail, ice, animals, insects, birds and sand. Report this type of damage according to AFI 91-204 but do not include in FOD rates.

4.6.1.2. From internal engine material failure (DOD), as long as damage is confined to that engine.

4.6.1.3. Caused by material failure of an aircraft component (DOD), if the component failure is reported as a deficiency report (DR) using the combined mishap DR reporting procedures in AFI 91-204 and TO 00-35D-54, USAF Deficiency Reporting and Investigation System.

4.6.1.4. Discovered during depot overhaul for maximum operating time.

4.6.2. Additionally, the following comments concerning FOD incidents apply:

4.6.2.1. Engine damage caused by improper anti-ice and de-ice procedures by either flight or ground crews is considered preventable.

4.6.2.2. Engine damage caused by gunnery or rocket mission ricochets is considered non-preventable provided mission parameters were not exceeded and range cleaning was sufficient.

4.6.2.3. Helicopter engine damage caused by rocks, stones, wood or other objects ingested during the low hover operations is considered non-preventable, provided mission parameters were not exceeded.

4.6.2.4. Preventable FOD incurred at test facilities and trim pads will be charged against the center's FOD rate.

4.6.2.5. Command FOD/DOP manager will assist in resolving any FOD issues that are questionable, e.g. preventable or non-preventable.

4.6.3. Calculating FOD Rates.

4.6.3.1. Calculate the ALC and AMARC FOD rates by MDS as follows: number of preventable FOD incidents (damage exceeding $20,000) ÷ aircraft flying hours X 1,000 = FOD rate.

4.6.3.2. Compute aircraft flying hours using acceptance flights, functional check flights, ground runs, and the number of un-installed engine (test cell) starts.

4.6.3.3. One thousand (1,000) represents an average number of aircraft and un-installed engine starts and is used as a baseline in order to determine what the acceptable FOD rate should be.

4.6.3.4. The ALC and AMARC preventable FOD standard is 3.0.

4.7. Final FOD Incident Report. The center FOD/DOP officer will provide a final FOD incident report to the owning unit and Command FOD/DOP manager upon completion of the FOD investigation to close out the FOD incident report. Use the same reporting procedures and formal FOD incident format as stated for initial FOD reporting and indicate the report as final. Annotate all evaluated and repaired FOD in applicable local forms and in the AFTO Form 95 or CEMS IAW TO 00-20-1. The Command FOD/DOP manager notifies owning MAJCOM and lead command. The lead command is notified to consolidate fleet wide data for identification of problems and provides information for all users.

4.8. Blade Blending Verification and Documentation Procedures. Procedures apply to maintenance performed on either installed or removed engines/modules.

4.8.1. Notify FOD/DOP focal point prior to blending a blade anytime FOD is identified.

4.8.2. Units will develop procedures to verify damaged blades deemed within TO limits and to verify all repaired blades (i.e. a second set of eyes).

4.8.3. Notify Engine Management Section with the following information for input into engine historical records: engine serial number, stage number, number of blades blended, depth of damage before and after blend, area of damage and employee number of maintenance personnel.

4.9. Quarterly FOD Reporting Procedures. The center FOD/DOP officer submits quarterly reports (monthly if deemed necessary by the Command FOD/DOP manager) to HQ AFMC/LG by message, e-mail or fax no later than the 15th day of a new quarter. Include in the report monthly cumulative FOD/DO data in the following format:

4.9.1. Number of preventable and non-preventable FOD incidents (damage exceeding $20,000).

4.9.2. Causes of preventable and non-preventable FOD incidents.

4.9.3. Cumulative cost of preventable and non-preventable FOD incidents.

4.9.4. MDS flying hours (include number of un-installed engine starts).

4.9.5. Calculated unit FOD rate and current cumulative FY FOD rate.

4.10. Annual FOD Reporting Procedures. The center FOD/DOP officer submits consolidated FY FOD data to HQ AFMC/LG no later than 31 October. Use the same reporting format as stated for the quarterly reports.

Chapter 5

DROPPED OBJECT REPORTING AND INVESTIGATION

5.1. Initial DO Incident Reporting Procedures.

5.1.1. Immediately notify the center FOD/DOP officer when an in-flight DO incident is discovered. The center FOD/DOP officer will initially report **all** DO incidents regardless of cost to the Command FOD/DOP manager by telephone, fax, or e-mail as soon as the incident is known, but no later than 72 hours after the occurrence, regardless if the DO incident is reportable under AFI 91-204. If the DO incident is deemed a mishap (dropped object causes damage to property or personnel) IAW AFI 91-204, the center FOD/DOP officer will initially report the DO incident to HQ AFMC, then work in tandem with the center SE office to properly report the mishap.

Note. Transient aircraft will be the responsibility of the host base FOD/DOP officer (e.g. ABW).

5.1.2. The Command FOD/DOP manager is HQ AFMC/LGMM, DSN 674-0085. commercial (937) 904-0085, fax DSN 986-1352, fax commercial (937) 656-1352. Email all initial DO reports to the AFMC/LG V3 DMS mailbox at **mailto:HQAFMC.LG.V3@WPAFB.AF.MIL**.

5.1.3. As a minimum, use the following formal initial DO incident format:

5.1.3.1. DOP program report number (unit, year and month, followed by sequence number – (example, OC-ALC/MAB-040301).

5.1.3.2. MDS.

5.1.3.3. Type mission and mission profile.

5.1.3.4. Aircraft tail number.

5.1.3.5. Owning organization and base.

5.1.3.6. Origin of sortie.

5.1.3.7. Date of incident and discovery location (if different than origin of sortie).

5.1.3.8. Geographical location of object, if known.

5.1.3.9. Item, noun, and description (use information from the applicable aircraft -4 series TOs).

5.1.3.10. TO, figure, and index.

5.1.3.11. Part number.

5.1.3.12. Correct work unit code (WUC) (full five-digit).

5.1.3.13. Date of last Phase, home station check (HSC), isochronal (ISO), and PDM inspection.

5.1.3.14. Last maintenance performed in the area and date.

5.1.3.15. Investigation findings (cause).

5.1.3.16. Cost in dollars to repair or replace as appropriate and cost in man-hours to repair.

5.1.3.17. Actions taken to prevent recurrence.

5.1.3.18. DRs submitted?

5.1.3.19. Unit POC information.

5.1.3.20. Other pertinent information.

5.1.4. After Hours Reporting. In addition to the aforementioned procedures for initial DO incident reporting, all ALCs and AMARC will report after hours DO incidents to HQ AFMC Warfighter Sustainment Division (WSD), DSN 787-5544, commercial (937) 257-5544. Email to **mailto:HQAFMC.BS.LG@WPAFB.AF.MIL**. WSD will then notify the Command FOD/DOP manager per **5.1.1.**

5.1.5. Report DO incident if it involves casualties, property damage, or if adverse publicity is likely, IAW AFI 10-206, Operational Reporting.

5.1.6. The center FOD/DOP officer notifies base/center SE, host base FOD/DOP manager, local Airfield Management and aircraft owning unit, if applicable. Command FOD/DOP manager will notify owning MAJCOM.

5.1.7. Units will maintain DO reports for 24 months.

5.2. DO Investigation. The center FOD/DOP officer appoints a DO monitor to investigate each DO incident. The aircraft will be impounded IAW AFMCI 21-139, Depot Maintenance Impoundment Procedures and local supplements until the DO investigation is complete. Every effort is made to determine the precise cause to ensure positive corrective action is accomplished. Any time material or design deficiency is the cause or suspected cause, a DR will be submitted IAW TO 00-35D-54, even when an exhibit is not available. Investigation results will be distributed to each appropriate work center for inclusion in personnel training and education programs.

5.3. Final DO Incident Report. The center FOD/DOP officer will provide a final DO incident report to the Command FOD/DOP manager upon completion of the DO investigation to close out the DO incident report. Use the same reporting procedures and formal DO incident format as stated for initial DO reporting and indicate the report as final. The Command FOD/DOP manager notifies the owning MAJCOM and lead command. The lead command is notified to consolidate fleet wide data for identification of problems and crossfeed information for all users.

5.4. Quarterly DO Reporting Procedures. The center FOD/DOP officer submits quarterly reports (monthly if deemed necessary by the Command FOD/DOP manager) to HQ AFMC/LG by message, e-mail or fax no later than the 15th day of a new quarter. The quarterly report will include a summary of the MDS, dates of incidents, DO nomenclatures (noun), national stock numbers (NSN), cost, specific causes and actions taken to prevent reoccurrences.

5.5. Annual DO Reporting Procedures. The center FOD/DOP officer submits consolidated FY FOD data to HQ AFMC/LG no later than 31 October. Use the same reporting format as stated for the quarterly reports.

5.6. Adopted Forms.

5.6.1. AFTO Form 95, **Significant Historical Data**

5.6.2. AFTO Form 781, **Aircrew/Mission Flight Data Document**

EUGENE COLLINS, Colonel, USAF
Chief, Depot Maintenance Programs Division Directorate of Logistics and Sustainment

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 91-204, *Safety Investigations and Reports*

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection and Health (AFOSH) Program*

AFI 10-206, *Operational Reporting*

AFPD 21-1, *Air and Space Maintenance*

AFOSH STD 91-100, *Aircraft Flight Line-Ground Operations and Activities*

TO 00-20-1, *Aerospace Equipment Maintenance General Policies and Procedures*

TO 00-25-234, *General Shop Practice Requirements for the Repair, Maintenance and Test of Electrical Equipment*

TO 00-35D-54, *USAF Deficiency Reporting and Investigation System*

AFMCI 21-107, *Tool Control and Accountability Program*

AFMCI 21-108, *Maintenance Training and Production Acceptance Certification (PAC) Program*

AFMCI 21-110, *Work Control Documents (WCD)*

Abbreviations and Acronyms

ABW—Air Base Wing

AFI—Air Force instruction

AFOSHSTD—Air Force Occupational Safety and Health Standard

AFMC—Air Force Materiel Command

AFSC—Air Force Specialty Code

AGE —Aerospace Ground Equipment

AMARC—Aerospace Maintenance and Regeneration Center

ALC —Air Logistics Center

CEMS—Comprehensive Engine Management System

DCMA—Defense Contract Management Agency

DMS—Defense Message System

DO—Dropped object

DOD—Domestic object damage

DOP —Dropped object prevention

DR—Deficiency report

DSN—Defense Switched Network

ESD—Electro static discharge

FO—Foreign object

FOD—Foreign object damage

FOD/DOP—Foreign object damage/Dropped object prevention

FY—Fiscal Year

GFE—Government Furnished Equipment

GOV—Government Operated Vehicle

HSC—Home station check

IAW—In accordance with

ISO—Isochronal inspection

IFR—In flight refueling

LG—Logistics Group

LGM—Logistics Group Maintenance

LSET—Logistics Standardization Evaluation Team

MDS—Mission, design, series

PDM—Programmed depot maintenance

POV—Private owned vehicle

TMSM—Type, Model, Series, Mission

TO—Technical Order

WSD—Warfighter Sustainment Division

WUC—Work Unit Code

Terms

Domestic Object Damage (DOD)—Any damage to an aircraft engine, aircraft system or equipment cause by internal failure of a component.

Dropped Object (DO)—A dropped object is any aircraft part, component, surface, or other item lost during aircrew operations, unless intentionally jettisoned between engine start to shut down. Inadvertently released munitions released in excess of quantity selected by the aircrew, or a multiple release, are not considered dropped objects and will be reported IAW AFI 91 204, *Safety Investigations and Reports*. Any object dislodged by a foreign object, e.g., an IFR boom or a bird, is not considered a dropped object and will be reported IAW AFI 91-204. Preventable dropped objects are defined as any item, such as aircraft panels, tires, etc., which were lost due to negligence during inspection or improper installation.

Flightline—Any area or facility including aprons, hardstands, and ramps on or in which aircraft may be parked, stored (AMARC gravel storage areas are not considered flight line), serviced or maintained and operated under their own power.

Foreign Object (FO)—A substance alien to aircraft, engines, munitions, missiles, drones, space systems, support equipment, AGE, trainers or components thereof that has been allowed to invade the product. Any FO in a maintenance area has the potential to cause damage.

Foreign Object Damage (FOD)—Any damage to an aircraft engine, aircraft system, equipment or tire caused by an external foreign object which may or may not degrade the required safety or operational characteristic of the engine, aircraft system or tire.

Jewelry—Watches, rings, necklaces, chains, bracelets, ear rings, lapel pins and other jewelry, that if dropped, has potential to become FO and cause FOD.

May—For the intent of this instruction, *may* is used to indicate possibility, be allowed or permitted to.

Maintenance Area—Any area where jet engine, on-equipment aircraft, aircraft assemblies, subassemblies, munitions, missiles, rockets, and support equipment maintenance operations are conducted to include hangars, shelters, docks (closed or semi closed), test cell, hush house, paint barns, fuels barns, back shops, industrial areas, on the flight line or outside maintenance areas such as wash racks, aprons, hardstands and run pads.

On-equipment—Maintenance performed on an aircraft.

Rag—A remnant of cloth (natural or synthetic material) that may be purchased in bulk, standardized, commercial quality, or vendor supplied shop cloth (uniform size and color) used in general industrial, shop, and flight line operations/maintenance (e.g. bearing, cheese, cotton, diaper, finishing, hand, lint free, terry, towel).

Shall/Will—For the intent of this instruction, the usage of *shall* and *will* expresses compliance.

Should—*Should* expresses obligation and is used to express likelihood.

While Performing Maintenance—Any maintenance operation where personnel actively work on, around or near jet engine, onequipment aircraft, aircraft assemblies, subassemblies, munitions, missiles, rockets, or support equipment and machinery that could potentially lead to or contribute to FO and FOD. Examples include but are not limited to, installing, removing, cleaning, repairing, inspection, servicing, testing and general hands on maintenance.