

**BY ORDER OF THE COMMANDER  
TWENTIETH AIR FORCE**

**TWENTIETH AIR FORCE  
INSTRUCTION 21-101**



**28 JUNE 2016**

**Maintenance**

**CRASH DAMAGED OR DISABLED  
AIRCRAFT RECOVERY (CDDAR) AND  
FOREIGN OBJECT DAMAGE (FOD)  
PROGRAMS**

**COMPLIANCE WITH THIS INSTRUCTION IS MANDATORY**

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Certified by: 582 HG/CC  
(Col David C. Smith)

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This instruction implements AFI21-101, *Aerospace Equipment Maintenance Management* and establishes policies for the Crash Damaged or Disabled Aircraft Recovery (CCDAR), Foreign Object Damage (FOD), and Dropped Object Prevention (DOP) programs. It applies to Air Force owned rotary-wing aircraft assigned to F. E. Warren AFB, WY, and Malmstrom AFB, MT. For 582d Helicopter Group rotary-wing aircraft assigned to Minot AFB, ND, these programs will be managed by the 5th MXG. This instruction provides the basic procedures to be followed for aircraft recovery/removal in the event of a crash/disabled aircraft after the initial response events have been accomplished. Physical aircraft removal procedures will not be implemented until approved by the Incident Commander (IC) or Fire Chief. Additionally, this instruction will outline how the FOD and Dropped Object Prevention (DOP) programs will be managed through the 582d Helicopter Group. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). Comply with AFI 33-332, *Air Force Privacy and Civil Liberties Program*, for documents containing privacy act information. Comply with AFI 16-1404, *Air Force Information Security Program* for documents containing For Official Use Only information. Refer recommended changes and questions about this publication to the office of primary responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route the AF Form 847 from the field through major command (MAJCOM)

publications/forms managers. See attachment 1 for a glossary of references and supporting information.

**NOTE: The 582d Helicopter Group Commander has the primary responsibility for establishing a CDDAR capability and maintaining a FOD/DOP program for 582 HG rotary-wing aircraft assigned assets. The 90th and 341st Missile Wing Command Posts will coordinate with the following agencies for CDDAR response: Base Fire Department, Helicopter Maintenance Operations Center (MOC), Civil Engineering and Readiness Flight, Wing Safety, Medical Squadron, Base Bioenvironmental, Security Forces, EOD, Vehicle Operations, Base Contracting, Force Support Squadron and other on/off base agencies as applicable. For the purpose of this instruction, a precautionary landing (PL) is an aircraft which has landed as a precautionary measure, but still has the capability to fly safely back to base upon evaluation by aircrew personnel. If a PL aircraft cannot safely fly back to base after evaluation by maintenance/aircrew personnel, a CDDAR team will be established.**

## **1. CDDAR Program Responsibilities:**

### 1.1. The 582d Helicopter Group (HG) will:

1.1.1. Establish a CDDAR capability IAW AFI 21-101, Chapter 11.

1.1.2. Appoint a qualified CDDAR Team Chief.

1.1.2.1. The CDDAR Team Chief requirements, as outlined in TO 00-80C-1, will be filled by 582 HG/MXOO Contracting Officer Representative (COR) and/or government approved contractor IAW an approved Performance Work Statement (PWS) for the 90th Missile Wing, F. E. Warren AFB, WY, and 341st Missile Wing, Malmstrom AFB, MT, as appropriate.

1.1.3. Provide qualified rotary wing aircraft maintenance subject matter experts (SME) to assist in aircraft recovery operations as directed by the CDDAR Team Chief. This will include recovery operations located at Camp Guernsey Joint Training Center, WY, for 582d HG assigned aircraft.

1.1.4. Appoint an aviation focused safety representative (582 HG/SEF).

1.1.5. Notify 90 MW/CC or 341 MW/CC of situation/circumstances involving aircraft incident for the impacted wing.

### 1.2. CDDAR Team Chief will:

1.2.1. Ensure team members are trained and proficient on rotary with specific MDS systems and procedures.

1.2.2. Ensure proper Personnel Protective Equipment (PPE) is available for use in CDDAR operations as determined by aircraft technical data and the base Bioenvironmental Engineering.

1.2.3. Control the activities of personnel and equipment involved in the aircraft recovery operations.

1.2.4. Coordinate activities for defueling/reconfiguring the aircraft.

1.2.5. Direct the activities for lifting, shoring, and transporting the damaged/disabled aircraft.

1.2.6. Ensure adequate tools and special equipment is serviceable and available for emergency recovery operations. Common special tools and equipment required are listed in Attachments 5 and 6.

1.2.7. Conduct an annual inventory on CDDAR equipment. If identified shortages and excess items exist, the report will be routed to the 582 HG/MXO, NLT 31 Aug.

1.2.8. Conduct/participate in annual CDDAR training exercises. This may include wing exercises, when requested. These events will be coordinated through the 90 MW/IG or 341 MW/IG.

1.2.9. Maintain CDDAR program continuity binder IAW TO 00-80C-1.

1.2.10. Ensure all procedures and plans are coordinated with base agencies and reviewed annually.

1.3. CDDAR Team will:

1.3.1. Maintain qualifications in aircraft recovery operations IAW 00-80C-1 and 1H-1-39.

1.3.2. Ensure proper PPE is in use at all times during recovery operations/exercises.

1.3.3. Track qualifications using government approved training plans. Contractor qualifications will be tracked in a government approved system IAW contractor Performance Work Statement (PWS).

1.3.4. Ensure all recovery procedures are accomplished in the safest manner possible and will attend applicable safety briefings prior to any operation/exercises.

1.4. Helicopter Maintenance Operations Center (MOC) will:

1.4.1. Contact the CDDAR Team Chief, 582 HG/MXO and COR, upon notification of an actual or exercise involving an aircraft recovery operation.

1.4.2. Serve as the helicopter maintenance focal point for collection and dissemination of aircraft information to/from the Emergency Operations Center (EOC) or the Incident Commander (IC) to/from the CDDAR Team Chief/Team.

1.4.3. Utilize, government approved, contract aircraft maintenance CDDAR checklist.

1.5. 37th Helicopter Squadron (HS) will:

1.5.1. Gather all applicable information regarding a F. E. Warren AFB, WY, assigned aircraft CDDAR incident (actual or exercise) for, to include: situation, location/coordinates, name and contact information of aircraft commander, time/date of incident, aircraft serial number/call sign, number of persons onboard and condition, remaining fuel on aircraft onboard, condition of aircraft, status of munitions/hazardous cargo onboard, status of classified information onboard, current weather conditions at location of aircraft, and on-scene communication. If the incident is located off-base, inform Command Post (CP) to activate the secondary crash net. If off-base, contact the following agencies: nearest fire, medical, and law enforcement/local sheriff.

- 1.5.2. Utilize 37 HS aircraft accident/incident checklist and contact appropriate agencies.
- 1.5.3. Divert aircraft, if appropriate, given situation.
- 1.5.4. Notify 582 HG/CC.
- 1.5.5. Notify Helicopter MOC.
- 1.5.6. Notify 582 HG/SEF, if the primary safety representative located on F. E. Warren AFB isn't available, an alternate will be used from one of the other 582 HG locations.
- 1.5.7. Notify SFS/MSC.
- 1.5.8. Notify TRF, if there are TRF individuals onboard.
- 1.5.9. Notify 90 MW/PA if aircraft is located on privately owned land.
- 1.5.10. Notify 90 MW/JA if aircraft is located on privately owned land.
- 1.6. 40<sup>th</sup> Helicopter Squadron will:
  - 1.6.1. Gather all applicable information regarding a Malmstrom AFB, MT, assigned aircraft CDDAR incident (actual or exercise) to include: Situation, location/coordinates, name of contact and phone number, time/date of incident, aircraft serial number/call sign, number of persons on board and condition, remaining fuel on helicopter and condition of helicopter, munitions/hazardous cargo, classified on board, weather, and on-scene communication. If on-base, inform CP to activate the secondary crash net. If off-base, contact the following agencies: nearest fire, medical, and law enforcement/local sheriff.
  - 1.6.2. Utilize 40 HS aircraft accident/incident checklist and contact appropriate agencies.
  - 1.6.3. Divert aircraft, if appropriate, given situation.
  - 1.6.4. Notify 582 HG/CC.
  - 1.6.5. Notify Helicopter MOC.
  - 1.6.6. Notify 582 HG/SEF, if the primary safety representative located on Malmstrom AFB isn't available, an alternate will be used from one of the other 582 HG locations.
  - 1.6.7. Notify BDOC/MSC.
  - 1.6.8. Notify TRF, if there are TRF individuals onboard.
  - 1.6.9. Notify 341 MW/PA if aircraft is located on privately owned land.
  - 1.6.10. Notify 341 MW/JA if aircraft is located on privately owned land.
- 1.7. The 90<sup>th</sup> Missile Wing:
  - 1.7.1. 90 MW/PA will:
    - 1.7.1.1. Contact MW leadership to recommend PA actions.
    - 1.7.1.2. Contact land owner, if applicable, to request permission for additional access for recovery efforts.
    - 1.7.1.3. Inform 37 HS/CC or DO once approval for additional access is granted.
    - 1.7.1.4. Coordinate with landowner and 90 MW/JA if any type of lawsuit or complaint exists.

1.7.2. 90 MW/CP will:

1.7.2.1. Activate the secondary crash net and run applicable 90 MW Installation Checklist.

1.7.2.2. Complete operational reporting requirements.

1.7.2.3. Monitor and disseminate appropriate information to 90 MW/CC/CV and 582 HG/CC, as necessary.

1.7.3. 790 MSFS, 90 MSFS, and/or 90 SFS will provide security support as needed by establishing cordon area and an entry/exist control point (ECP) to preserve incident evidence in conjunction with Fire Chief, Bioenvironmental Engineering, and Incident Commander (IC).

1.7.4. 90 MW/CES will:

1.7.4.1. Determine land ownership if incident is located off base and inform 90 MW/PA of ownership and contact information.

1.7.4.2. Provide fire protection if incident is located on base as required.

1.7.4.3. Provide a crane (e.g., 20 ton, 50 ton, as applicable) and a qualified operator. This will include recovery operations for 582d HG assigned aircraft located at Camp Guernsey Joint Training Center, WY.

1.7.5. 90 MDG will:

1.7.5.1. Provide medical personnel to respond in situations where aircrew/TRF members need medical attention.

1.7.5.2. Assist the IC and be available for medical consultation and evaluation of CDDAR personnel in case of ill effects of composite exposure or any other hazards.

1.7.6. Bioenvironmental Engineering will:

1.7.6.1. Be directly involved in determining personnel health hazards, training required and appropriate levels of PPE. Bioenvironmental Engineering will also make provisions to recall a representative for non-duty hours.

1.7.6.2. Evaluate the scene for potential health hazards and will provide assessments to the IC and CDDAR Team Chief.

1.7.6.3. Bioenvironmental Engineering will provide constant updated site conditions to IC and CDDAR Team Chief. Bioenvironmental Office will also work with the IC, CDDAR Team Chief and Security Forces in determining the peripheral area (The peripheral area should be more than 25 feet away from damaged composite parts, depending on environmental conditions).

1.7.6.4. The Bioenvironmental Engineering will be responsible for the evaluation of any contamination to the environment, assessing the necessary cleanup, disposal of contaminated components, and coordination with the appropriate Federal and State Regulatory agencies.

1.7.6.5. Brief recovery personnel on all potential hazards and specify proper PPE as required based on assessment.

1.7.6.6. Will provide respirator training to all recovery personnel.

1.7.7. 90 MW/LRS will:

1.7.7.1. Provide support for recovery operations for 582 HG assigned aircraft located at Camp Guernsey Joint Training Center, WY.

1.7.7.2. Coordinate delivery of heavy machinery with operators as determined by the CDDAR Team Chief and OSC. Ex: provide a 37 ft. (or similar) flatbed semi-trailer and semi-truck with a qualified driver and assistant as determined by the CDDAR Team Chief and IC.

1.7.7.3. Provide properly equipped refueling personnel/vehicles to support off-base fueling, if required.

1.7.8. 90 MW/CONS will procure needed supplies and coordinate with the IC and CDDAR Team Chief for availability and delivery of all emergency requests.

1.7.9. 90 MW/FSS will provide billeting, meals, ice, water, etc. and any other services as deemed necessary by the IC.

1.7.10. 90 MW/FMO will establish a fund site to procure needed equipment and supplies necessary in the CDDAR recovery operation.

1.7.11. 90 MW/Base Safety Office will:

1.7.11.1. Coordinate procedures with the CDDAR Team Chief and 582 HG/SEF safety office as required. If the primary safety representative located on F. E. Warren AFB isn't available, an alternate will be used from one of the other 582 HG locations. The 582 HG/SEF will disseminate the appropriate information to the 90 MW/SEF. Safety will also give guidance for preservation of evidence for the SIB. (Ref AFMAN 32-4004, AFI 91-204.)

1.8. The 341st Missile Wing:

1.8.1. 341 MW/PA will:

1.8.1.1. Contact 341 MW leadership to recommend PA actions.

1.8.1.2. Contact land owner, if applicable, to request permission for additional access for recovery efforts.

1.8.1.3. Be prepared to work with landowner and 341 MW/JA if any type of lawsuit or complaint exists.

1.8.1.4. Inform 40 HS/CC or DO once approval for additional access is granted.

1.8.2. 341 MW/CP will:

1.8.2.1. Monitor and disseminate appropriate information to MW/CC/CV, HG/CC and 40 HS/CC.

1.8.2.2. Accomplish local checklists as required upon notification of an aircraft incident.

1.8.2.3. Perform any OpRep-3 criteria.

1.8.3. 741 MSFS, 341 MSFS and/or 341 SFS will provide security support as needed by establishing cordon area and an entry/exist control point (ECP) to preserve incident evidence in conjunction with Fire Chief, Bioenvironmental Engineering, and Incident Commander (IC). If the aircraft is located at a secure location (e.g. Lewistown Airport) no SFG support is required. If the aircraft is located at a MAF, periodic sweeps by local security teams should suffice. If the aircraft is at an unsecure location, such as an LF or field, an in-place security team should be postured to maintain positive control of the aircraft. Aircrew or non-security forces personnel may serve as the in-place security team.

1.8.4. 341 MW/CES will:

1.8.4.1. Determine land ownership if off the MAFB installation and inform 341 MW/PA of ownership contact information.

1.8.4.2. Provide fire protection on base, as required.

1.8.4.3. Provide properly equipped CE personnel/vehicles to support helicopter transportation via the ground.

1.8.4.4. Provide a crane (e.g., 20 ton, 50 ton, as applicable) and a qualified operator.

1.8.5. 341 MDG will provide medical personnel to respond in situations where helicopter aircrews need medical attention.

1.8.6. 341 MDG/BE will provide recommendations on appropriate PPE to the IC during CDDAR operations.

1.8.7. 341 MW/LRS will:

1.8.7.1. Provide properly equipped refueling personnel/vehicles to support off-base fueling, if required.

1.8.7.2. Provide a 37 ft. (or similar) flatbed semi-trailer and semi-truck with a qualified driver and assistant.

1.8.8. 341 MW/CONS will procure needed supplies and coordinate with the IC and CDDAR Team Chief for availability and delivery of all emergency requests.

1.8.9. 341 MW/FSS will provide billeting, meals, ice, water, etc. and any other services as deemed necessary by the IC.

## **2. FOD Program Responsibilities.**

2.1. The 582 HG/CD will:

2.1.1. Appoint the Wing (or equivalent) Foreign Object Damage (FOD) and Dropped Object Prevention (DOP) Program Managers.

2.1.1.1. These requirements will be filled by 582 HG/MXOO COR (Contracting Officer Representative) or government approved contractor IAW Performance Work Statement (PWS) for the 90th Missile Wing, F. E. Warren AFB, WY, and 341st Missile Wing, Malmstrom AFB, MT.

2.1.2. Chair the quarterly FOD prevention meeting as applicable. This meeting may be combined with other related quarterly meetings. Conditions and/or trends may require the meeting to be held on a monthly basis if needed.

2.2. The 582 HG/FOD Monitors will:

2.2.1. Train all unit FOD monitors and alternates. All aspects of FOD education, prevention and protection will be presented.

2.2.2. Conduct and document FOD prevention monitor program spot inspections to ensure compliance with this instruction.

2.2.3. Conduct routine inspections and follow-ups of FOD walks to ensure compliance with the prevention program.

2.2.4. Perform weekly FOD check point assessments and document compliance and non-compliance.

2.2.5. Plan and facilitate a FOD walk annually to include: helicopter maintenance and operation areas.

2.2.6. Develop a robust FOD program.

2.2.7. Maintain FOD information on a bulletin board in each work center where personnel are authorized access to the flight line. One centrally located board may cover all shops located within a single building. Contractors will follow their FOD program accepted by the contracting officer. At a minimum, the board will contain FOD prevention point of contact visual aids for wing and unit program monitor. The board may be co-located with other safety-related items and does not need to be strictly for FOD prevention.

2.2.8. Maintain a FOD continuity binder. At a minimum the binder will contain the following:

2.2.8.1. Tab A, copy of FOD monitor appointment letter.

2.2.8.2. Tab B, copy of Wing FOD plan.

2.2.8.3. Tab C, appropriate FOD self-inspection checklist

2.2.8.4. Tab D, documentation of weekly aircraft maintenance/operation area FOD walks, spot checks, FOD briefings, and FOD walk policy letter.

2.2.8.5. Tab E, 582 HG FOD committee meeting minutes/slides (for one year).

2.2.8.6. Tab F, copy of this instruction and FOD Prevention Plan.

2.3. IAW applicable guidance all personnel authorized on the flight line will:

2.3.1. Pay close attention to areas under and immediately in front of helicopters during all FOD walks. Contractors will follow their FOD program accepted by the contracting officer for all FOD walk requirements. FOD walk follow-up assessments and documentation requirements may be conducted by the Wing FOD Monitor or Wing/582 HG Safety.

2.3.2. Monitor aircraft maintenance/operation areas to ensure a FOD free area. Secure FOD containers to vehicles that are normally operating in any aircraft



maintenance/operations area in a manner that does not modify or damage rental or government leased vehicles and prevents the container from tipping over while the vehicle is in motion. Vehicle FOD containers may be locally manufactured and secured using bungee cord or similar material. Containers will not be obscured from view.

2.3.3. Call Helicopter Maintenance Operations Center (HMOC) for any aircraft area requiring a sweeper. HMOC will then make arrangements for the sweeper requirement.

2.3.4. Units will clean all grounding/mooring points within their respective areas on as needed basis. When cleaning, ensure grounding/mooring points are kept free of sand and rock build-up that could hide potential FOD sources. This only applies to the grounding/mooring points in the eight helicopter parking spot circles.

2.3.5. All maintenance personnel working in aircraft maintenance/operation areas or hanger floors will perform FOD walks or checks in their respective areas a minimum of once per day. These dock areas are subject to spot inspections by all monitoring agencies and levels of supervision.

2.3.6. All loose hardware will be contained in cloth screw bags or other suitable container that can be closed and secured to the removed item to prevent them from becoming FOD hazards.

2.3.7. All personnel performing maintenance of any kind in areas where helicopters operate or would occupy will inventory and account for all tools, equipment, and electronic devices before leaving the job site. If a piece of equipment cannot be accounted for they will immediately notify HMOC, aircraft maintenance/operations and the job site supervisor.

2.3.8. Aircraft covers and tie downs will remain installed until the crew removes them IAW To 1H-1(U)N-1CL-1 exterior inspections. Engine covers and tie downs will be installed after aircraft shutdown. Pitot covers will be installed after pitot tube is cool enough not to burn the cover.

2.3.9. Will ensure lost tools are reported to maintenance supervision immediately and government approved lost tool procedures are followed IAW PWS.

2.4. 90 MW and 341 MW and Tenant Units with personnel authorized unescorted entry and authorization to drive in the helicopter area will:

2.4.1. Comply with all requirements outlined in this instruction.

2.4.2. Contractors will follow their FOD programs accepted by the contracting officer.

2.5. Prior to any helicopter engine operation, personnel will ensure the following:

2.5.1. Tools, equipment and hardware have been accounted for and secured.

2.5.2. A FOD Inspection of engine inlets, all decks and accessible compartments prior to engine operation is signed off in the helicopter 781A forms.

2.6. Flight line clothing:

2.6.1. Metal insignias/badges will not be worn on the flight line.

2.6.2. Wigs, hairpieces, metal hair fasteners, earrings, or any other jewelry that may fall off without notice, are not authorized on the flight line.

2.6.3. Loose fitting clothing or other apparel that may be caught in on the aircraft should not be worn. Climate and safety will be considered.

2.6.4. Escorts of visiting personnel will ensure FOD prevention measures are taken.

### **3. Dropped Object Prevention (DOP) Program.**

3.1. A dropped object is any item that falls from an aircraft after engine start and before engine shutdown. For the purpose of this instruction, a secondary structure refers to any door, panel, cover, or cowling designed to be removed from the aircraft for maintenance purposes. Items that are dropped for mission requirements, such as Landing Zone Markers, are not considered dropped objects and are not reportable as such.

3.2. Preventable Dropped Object. Any item lost due to negligence during inspection or installation.

3.3. The prevention of in-flight loss of aircraft panels, parts, access doors, and other objects is the goal of DOP Program. All maintenance personnel must be aware of the potential for dropped objects. Technicians must ensure the proper installation of panels and doors, and the quality of maintenance performed on structural components. All passengers will receive a briefing from the pilot or flight engineer and if an item is lost during flight, passenger(s) should notify the flight engineer.

3.4. Dropped Object Prevention is the responsibility of all aircraft operators and maintainers. All personnel working in, on, and around aircraft must comply with the requirements of this instruction. When installing aircraft panels, doors, and components, place special emphasis on the condition of latches, fasteners, hinge pins, and hinge lobes. Ensure panels, doors, and components fit properly and are attached securely, greatly reducing the chances for dropped objects.

3.5. Individuals tasked to remove or install external panels, fairings, engine cowling, antennas, windshields, and external light assemblies will enter a Red X in the aircraft forms prior to starting the removal/opening action. The Red X will be properly cleared IAW TO 00-20-1. EXCEPTION: Procedures that require removal of a component as a step of the task and contain all of the steps for component removal/installation within the same procedure do not need to be documented separately.

### **4. FOD/DOP Investigation and Reporting.**

4.1. The wing FOD/DOP program manager will be notified of all FOD, dropped objects, and suspected/confirmed engine FOD damage.

4.2. The wing FOD/DOP monitor will track, report, and investigate all foreign object damage and dropped objects IAW Attachments 2 and 3 and provide a synopsis of each event to the 582 HG/CD.

4.3. All FOD incidents that cause damage will be reported to the 582 HG/CD, [AFGSC.A4VA.WORKFLOW@US.AF.MIL](mailto:AFGSC.A4VA.WORKFLOW@US.AF.MIL) and HQ 20AF/A3H within 24 hours of notification.

4.4. Dropped Object Incident Notification:

4.4.1. Anyone suspecting a dropped object will immediately notify the appropriate shift lead, HMOC, Quality Control (QC) Inspector, Site Manager or as indicated on the Dropped Object Reporting Checklist, Attachment 4.

4.4.2. Within 24 hours of the occurrence, the Dropped Object Officer/Monitor will report any dropped object to the 582 HG/MXO via telephone or e-mail.

4.4.2.1. For DOP incidents that occur on F. E. Warren AFB assigned aircraft, the 90 MW/CP will be notified of any dropped object that has potential to gain media coverage, cause injury/death, or causes civilian property damage.

4.4.3. Each dropped object incident will be thoroughly investigated as soon as the loss is discovered. Efforts will be made to determine the exact cause of the dropped object so proper corrective action may be taken to prevent reoccurrence.

4.4.4. The Shift Lead/QC will ensure the aircraft forms are reviewed to verify the item is a dropped object and were not removed by maintenance personnel.

4.4.5. Impacted aircraft may be impounded if deemed necessary by maintenance supervision. **Note:** No maintenance of any type will be accomplished in the dropped object area until the appropriate activities, as required by individual circumstances, perform an investigation.

4.4.6. Causal by natural environmental factors or wildlife such as hail, ice, animals, insects, sand, and birds will not be included in DOP reporting. Report this type of damage IAW AFI 91-204, Safety Investigations and Reports.

4.4.7. The local DOP monitor will be responsible to investigate dropped objects from transient aircraft. The DOP monitor will provide the home station DOP monitor with sufficient data to generate a report for trending and tracking purposes.

4.4.8. The Dropped Object Officer/Monitor will submit a formal report to [AFGSC.A4VA.WORKFLOW@US.AF.MIL](mailto:AFGSC.A4VA.WORKFLOW@US.AF.MIL), 582 HG/SEF, and 582 HG/CD within three duty days and will contain the minimum information indicated in Attachment 3.

4.4.9. Units will maintain reports for a minimum of 24 months (may be electronic).

4.4.10. Quarterly DOP Summary may be briefed in conjunction with the quarterly FOD meeting.

#### 4.5. Material Deficiency:

4.5.1. If a material deficiency caused the dropped object, submit a Material Deficiency Report (DR), IAW Tech Order 00-35D-54, USAF Material Deficiency Reporting and Investigating System.

ANTHONY J. COTTON, Maj Gen, USAF  
Commander

## Attachment 1

### GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

#### *References*

AFPD 21-1, *Air and Space Maintenance*, 25 February 2003  
 AFI 21-101, *Aerospace Equipment Maintenance Management*, 26 July 2010, Incorporating Change 1, 16 August 2011  
 AFMAN 33-363, *Management of Records*, 1 March 2008  
 AFI 16-1404, *Air Force Information Security Program*, 29 May 2015

AFI 33-332, *Air Force Privacy and Civil Liberties Program*, 12 January 2015

AFMAN 33-363, *Management of Records*, 01 March 2008

AFI11-202 V3, *General Flight Rules*, 07 November 2014

AFI11-2UH-1N V3 CL-1, *UH-1N Helicopter Crew Briefing Guides and Checklists*, 16 March 2015

TO 00-35D-54, *USAF Material Deficiency Reporting and Investigating System*  
 TO 00-20-2, *Maintenance Data Documentation*  
 TO 1-1-300, *Maintenance Operational Checks and Check Flights*

TO 1H-1(U)N-6CF-1, *Acceptance and Functional Checkflight Procedures*

TO 1H-1(U)N-6CL-1, *Checklist Acceptance and/or Functional Checkflight*

#### *Abbreviations and Acronyms*

**AFRIMS**—Air Force Records Information Management System

**DOP**—Dropped Object Prevention

**DR**—Deficiency Report  
**FOD** – Foreign Object Damage

**HMOC**—Helicopter Maintenance Operations Center

**OPR**—Office of Primary Responsibility

**QC**—Quality Control

**RDS**—Records Disposition Schedule

**TO**—Technical Order

#### *Prescribed and Adopted Forms*—:

**Prescribed Forms**:—There are no forms prescribed by this publication.

Adopted Forms:

AF Form 847, *Recommendation for Change of Publication*

AFTO 781A, *Maintenance Discrepancy and Work Document*

## Attachment 2

## FOREIGN OBJECT DAMAGE REPORT

Figure A2.1. Foreign Object Damage Report.

- A2.1. MEMORANDUM FOR *Date*  
FROM: <Unit Designation/Office Symbol> <Street> <Base and Zip Code>  
SUBJECT: <Foreign Object Report> . FOD program report number (unit, year, and month, followed by sequence number -- example, 40HS-060501).
- A2.2. Type of report: Initial/Formal Update/Final FOD Report
- A2.3. Date and Time of Incident:
- A2.4. Unit and Base of Incident:
- A2.5. Origin of Sortie:
- A2.6. When discovered: (Preflight, Postflight, In-Coming, ETS, etc.)
- A2.7. Owning Unit, Base and MAJCOM:
- A2.8. MDS and Tail Number: (N/A for ETS incidents)
- A2.9. Engine Type, Make, Series (TMS):
- A2.10. Engine S/N:
- A2.11. Engine Position (If Applicable):
- A2.12. Time Since Overhaul:
- A2.13. Description of Incident:
- A2.14. Material Failure: (Yes or No)
- A2.15. Tech Data Deficiency: (Yes/No)
- A2.16. Preventable/Non-Preventable:
- A2.17. Investigation Findings:
- A2.18. Action Taken to Prevent Recurrence:
- A2.19. Parts Cost: Labor Cost: Total Cost:
- A2.20. Additional Comments (if necessary):
- A2.21. <Sign> FOD Monitor, <Unit Designation>

## Attachment 3

**DROPPED OBJECT REPORT****Figure A3.1. Dropped Object Report.**

- A3.1. MEMORANDUM FOR Date  
FROM: <Unit Designation/Office Symbol> <Street> <Base and Zip Code>  
SUBJECT: <Dropped Object Report> . DOP program report number (unit, year, and month, followed by sequence number -- example, 37HS-060501).
- A3.2. MDS.
- A3.3. Type Mission and mission profile.
- A3.4. Aircraft Tail Number.
- A3.5. Owning organization and base:
- A3.6. Origin of sortie.
- A3.7. Date of incident and discovery location.
- A3.8. Geographic location of object (if known).
- A3.9. Item, noun and description (use information from the applicable aircraft -4 series TOs).
- A3.10. TO, figure and index.
- A3.11. Part number.
- A3.12. Correct Work Unit Code (full five-digit)/Ref Des.
- A3.13. NSN.
- A3.14. Date of last Phase and PDM inspection.
- A3.15. Last maintenance performed in the area and date.
- A3.16. Investigation findings (cause).
- A3.17. Costs in dollars to repair or replace as appropriate and cost in man-hours to repair.
- A3.18. Actions to prevent recurrence.
- A3.19. DR submitted?
- A3.20. Unit POC information (Name, DSN number, and office symbol).
- A3.21. Other pertinent information:

**Attachment 4**

**DROPPED OBJECT REPORTING CHECKLIST**

**A4.1.** Upon verification of a dropped object, the discovering technician or whoever has direct knowledge of the incident shall immediately notify the following (affected installation; F. E. Warren AFB or Malmstrom AFB) with the DATE/TIME:

A4.1.1. Helicopter Maintenance Operations Center (HMOC).

A4.1.2. Maintenance Supervision.

**A4.2.** The HMOC will notify:

A4.2.1. Site Manager

A4.2.2. Site Quality Control (QC) Inspector.

A4.2.3. Wing Command Post.

A4.2.4. 582 HG/Safety

A4.2.5. 582 HG/MXO.

A4.2.6. 582 HG/CD.

A4.2.7. Helicopter Squadron Operations.

## Attachment 5 (Malmstrom)

## OFF BASE RECOVERY TOOLS CHECKLIST

Figure A5.1. Recovery Kits.

Recovery Kit #1

1.	1 ea	CARGO TIE-DOWN STRAPS
2.	1 ea	CARGO TIE-DOWN STRAPS
3.	1 ea	SHACKLE (LARGE) W/BOLT, NUT & COTTER KEY
4.	1 ea	CLEVIS (P/N 204-011-178)
5.	1 BAG	TIE DOWN RINGS (LARGE)
6.	1 BAG	TIE DOWN RINGS (SMALL)
7.	1 BAG	TIE DOWN TINGS (HEAVY DUTY)
8.	1 ea	ROLL ELECTRICAL TAPE
9.	1 ea	ROLL MASKING TAPE
10.	1 ea	ROLL MASKING TAPE
11.	1 ea	ROLL DUCT TAPE
12.	1 ea	TAPE MEASURE 25 FT.
13.	1 ea	CHAIN 20 FT. 3/8 INCH DIAMETER
14.	1 ea	CHAIN 20 FT. 3/8 INCH DIAMETER
15.	1 ea	STABILIZER BAR TIE-DOWNS
16.	1 ea	STABILIZER BAR TIE-DOWNS
17.	1 ea	MAIN ROTOR BLAD TIE-DOWNS
18.	1 ea	MAIN ROTOR BLAD TIE-DOWNS
19.	1 ea	TAIL ROTOR COVER W/TIE DOWN
20.	1 BAG	MISC SMALL PARTS BAG
21.	1 BAG	CHAFF PADS & WIRE TIES
22.	1 ea	F4 TAPE ROLL
23.	1 ea	SHACKLIE 3/4 INCH 9500 CAPACITY
24.	1 ea	SHACKLIE 3/4 INCH 9500 CAPACITY
25.	1 ea	SHACKLIE 3/4 INCH 9500 CAPACITY
26.	1 ea	SHACKLIE 3/4 INCH 9500 CAPACITY
27.	1 BAG	MISC PARTS
28.	1 ea	GUIDE ROPE
29.	1 ea	GUIDE ROPE
30.	1 ea	PADLOCK
31.	1 ea	PADLOCK
32.	1 ea	MIL
33.	1 ea	1/4" DRIVE RATCHET
34.	1 ea	7/16" X 1/4" DRIVE SOCKET (SHALLOW)
35.	1 ea	7/16" X 1/4" DRIVE SOCKET (DEEP)
36.	1 ea	5/16" X 1/4" DRIVE SOCKET (SHALLOW)
37.	1 ea	2" X 1/4" DRIVE EXTENSION
38.	1 ea	7/16" BOX OPEN END WRENCH
39.	1 ea	SAFETY WIRE PLIERS
40.	1 ea	4" COMMON TIP SCREW DRIVER
41.	1 ea	4" #2 PHILLIP SCREW DRIVER
42.	1 ea	8" CRESCENT WRENCH
43.	1 ea	8" DYKES
44.	1 ea	ROLL .032 SAFETY WIRE



45. 1 ea MASTER INVENTORY LISTING

**Recovery Kit #2**

1. 1 ea BREAKER BAR (PIPE)  
2. 1 ea TIEDOWN CHAIN  
3. 1 ea TIEDOWN CHAIN  
4. 1 ea TIEDOWN CHAIN  
5. 1 ea TIEDOWN CHAIN  
6. 1 ea TIEDOWN CHAIN  
7. 1 ea TIEDOWN CHAIN  
8. 1 ea TIEDOWN CHAIN  
9. 1 ea TIEDOWN CHAIN  
10. 1 ea MOORING TIEDOWN  
11. 1 ea MOORING TIEDOWN  
12. 1 ea MOORING TIEDOWN  
13. 1 ea MOORING TIEDOWN  
14. 1 ea MOORING TIEDOWN  
15. 1 ea MOORING TIEDOWN  
16. 1 ea MOORING TIEDOWN  
17. 1 ea MOORING TIEDOWN  
18. 1 ea MOORING TIEDOWN  
19. 1 ea MOORING TIEDOWN  
20. 1 ea BINDER (RED)  
21. 1 ea BINDER (RED)  
22. 1 ea BREAKER BAR 3/4" DRIVE  
23. 1 ea DEEP SOCKETT HEAVY DUTY 1 1/4"  
24. 1 ea OFF BASE RECOVERY BOOK  
25. 1 ea PADLOCK  
26. 1 ea MASTER INVENTORY LISTING

**Attachment 6 (F. E. Warren)****SPECIAL TOOLS AND EQUIPMENT****OFF BASE RECOVERY TOOLS CHECKLIST****Figure A6.1. Equipment List for Retrieval of Downed H-1 Helicopters.**

*Equipment List for Retrieval of Downed H-1 Helicopters.*

Equipment List for Retrieval of Downed H-1 Helicopters.

1.	8 ea	MATTRESSES
2.	1 ea	TRANSPORT SADDLE
3.	2 ea	CHAIN BINDERS (7937746)
4.	1 ea	SET GROUND HANDLING WHEELS
5.	1 ea	BUNDLE RAGS
6.	1 ea	ROLL TAPE, ELECTRICIANS
7.	2 ea	ROLL TAPE, MASING 2 in
8.	100 ft.	NYLON CORD OR ROPE
9.	2 ea	RED FLAGS
10.	1 ea	FIRE EXTINGUISHER, 50 lb.
11.	1 ea	SOCKET 1 1/4 X 1/2 in drive
12.	2 ea	MAIN ROTOR SLINGS (T100220)
13.	1 ea	BREAKING BAR
14.	2 ea	GRIP POSITIONING LINK (T10123)
15.	1 ea	TRANSMISSION LIFT PLATE (204-040-929-9)
16.	1 ea	HINGE HANDLE 1/2 in drive
17.	1 ea	COMPLETE MECHANICS TOOL BOX
18.	1 ea	MAST LIFTING EYE
19.	1 ea	SHACKLE, AIRCRAFT TIE DOWN (A116-18)
20.	1 ea	SOCKET BLADE, RETAINING PIN (T101414)
21.	1 ea	BLADE PIN PULLER (Locally Manufactured)
22.	1 ea	MAIN ROTOR HUB STAND (unmounted)
23.	1 ea	TRIM TAB GUAGE (101485)
24.	1 ea	TIE DOWN ASSEMBLY (Main Rotor Fwd) (Locally Manufactured) (8523902)
25.	1 ea	TIE DOWN ASSEMBLY (Main Rotor Aft) (Locally Manufactured) (8523903)
26.	1 ea	MASTER INVENTORY LISTING
27.	As Req	(SPILL KIT)
28.	As Req	8 ea HARD HATS
29.	As Req	FLIR BALL CASE
30.	As Req	FLIR BALL HANDLES
31.	As Req	FLIR BALL JACKS
32.	As Req	1 ea AIRCRAFT LIFTING CLEVIS
33.	As Req	TIE DOWN STRAPS
34.	As Req	MOORING STRAPS

**Recovery Kit #1**

1.	1 EA	CARGO TIE-DOWN STRAPS
2.	1 EA	CARGO TIE-DOWN STRAPS
3.	1 EA	SHACKLE (LARGE) W/BOLT, NUT & COTTER KEY
4.	1 EA	CLEVIS (P/N 204-011-178)
5.	1 BAG	TIE DOWN RINGS (LARGE)
6.	1 BAG	TIE DOWN RINGS (SMALL)
7.	1 BAG	TIE DOWN RINGS (HEAVY DUTY)
8.	1 EA	ROLL ELECTRICAL TAPE
9.	1 EA	ROLL MASKING TAPE
10.	1 EA	ROLL MASKING TAPE
11.	1 EA	ROLL DUCT TAPE
12.	1 EA	TAPE MEASURE 25 FT.
13.	1 EA	CHAIN 20 FT. 3/8 INCH DIAMETER
14.	1 EA	CHAIN 20 FT. 3/8 INCH DIAMETER
15.	1 EA	STABILIZER BAR TIE-DOWNS
16.	1 EA	STABILIZER BAR TIE-DOWNS
17.	1 EA	MAIN ROTOR BLADE TIE-DOWNS
18.	1 EA	MAIN ROTOR BLADE TIE-DOWNS
19.	1 EA	TAIL ROTOR cover w/ TIE DOWN
20.	1 BAG	MISC SMALL PARTS BAG
21.	1 BAG	CHAFF PADS & WIRE TIES
22.	1 EA	F4 TAPE ROLL
23.	1 EA	SHACKLE 3/4 INCH 9500 CAPACITY
24.	1 EA	SHACKLE 3/4 INCH 9500 CAPACITY
25.	1 EA	SHACKLE 3/4 INCH 9500 CAPACITY
26.	1 EA	SHACKLE 3/4 INCH 9500 CAPACITY
27.	1 BAG	MISC PARTS
28.	1 EA	GUIDE ROPE
29.	1 EA	GUIDE ROPE
30.	1 EA	PADLOCK
31.	1 EA	PADLOCK
32.	1 EA	MIL
33.	1 EA	1/4" DRIVE RATCHET
34.	1 EA	7/16" X 1/4" DRIVE SOCKET (SHALLOW)
35.	1 EA	7/16" X 1/4" DRIVE SOCKET (DEEP)
36.	1 EA	5/16" X 1/4" DRIVE SOCKET (SHALLOW)
37.	1 EA	2" X 1/4" DRIVE EXTENSION
38.	1 EA	7/16" BOX OPEN END WRENCH
39.	1 EA	SAFETY WIRE PLIERS
40.	1 EA	4" COMMON TIP SCREW DRIVER
41.	1 EA	4" #2 PHILLIP SCREW DRIVER
42.	1 EA	8" CRESCENT WRENCH
43.	1 EA	8" DYKES
44.	1 EA	ROLL .032 SAFETY WIRE
45.	1 EA	MIL

**Recovery Kit #2**

1. 1 EA BREAKER BAR (PIPE)
2. 1 EA TIEDOWN CHAIN
3. 1 EA TIEDOWN CHAIN
4. 1 EA TIEDOWN CHAIN
5. 1 EA TIEDOWN CHAIN
6. 1 EA TIEDOWN CHAIN
7. 1 EA TIEDOWN CHAIN
8. 1 EA TIEDOWN CHAIN
9. 1 EA TIEDOWN CHAIN
10. 1 EA MOORING TIEDOWN
11. 1 EA MOORING TIEDOWN
12. 1 EA MOORING TIEDOWN
13. 1 EA MOORING TIEDOWN
14. 1 EA MOORING TIEDOWN
15. 1 EA MOORING TIEDOWN
16. 1 EA MOORING TIEDOWN
17. 1 EA MOORING TIEDOWN
18. 1 EA MOORING TIEDOWN
19. 1 EA MOORING TIEDOWN
20. 1 EA BINDER (RED)
21. 1 EA BINDER (RED)
22. 1 EA BREAKER BAR ¾" DRIVE
23. 1 EA DEEP SOCKETT HEAVY DUTY 1 ¼"
24. 1 EA OFF BASE RECOVERY BOOK
25. 1 EA PADLOCK
26. 1 EA MIL