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**Maintenance**

**CRASH-DAMAGED/DISABLED AIRCRAFT  
RECOVERY (CDDAR)**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This Dover Air Force Base Instruction (DAFBI) provides the basic procedures to be followed for aircraft recovery/removal of a crash/disabled aircraft after all initial response events have been accomplished IAW OPLAN 32-1, *Disaster Preparedness* or OPLAN 32-2, *Standby Emission Plan*. Physical aircraft removal procedures will not be implemented until approved by the On Scene Commander (OSC). This instruction outlines policy and establishes responsibility and procedure guidelines to support an effective Crash Recovery Program. **NOTE:** Unless your work center is a part of the initial response element (IRE) of the disaster control group (DCG), it remains in a standby mode until directed by the OSC to proceed to the accident site as a part of the follow-on element (FOE) of the DCG. The composition of the IRE and the FOE is clearly stated in AFMAN 32-4004, Chapter 2, *Emergency Response Operations*. Additionally, the local response procedure is directed in the Base OPLAN 32-1. Unless requests for respondents are covered (tasked) in one of these documents, the OSC, or other pertinent authority, considers the consequences of deviations.

## **1. Policy.**

1.1. The Crash Recovery Program (CDDAR) is established to recover damaged and disabled aircraft in minimum time consistent with the following considerations:

- 1.1.1. The requirement to reopen the runway for operational use.
- 1.1.2. Prevention of unnecessary secondary damage.
- 1.1.3. Preservation of evidence for accident/safety investigation.
- 1.1.4. Safety of personnel involved with recovery operation.

**WARNING:** Incidents involving all aircraft with hazardous fluids and/or a composite structure may cause serious injury or death to those in contact with it. Transient aircraft home bases should be contacted to determine composite material risks and requirements for Personal Protective Equipment (PPE).

**WARNING:** There will be no smoking within 50 feet of the crash recovery trailer. The trailer contains flammable fuel.

**CAUTION:** The aircraft and crash site will be disturbed only to the extent required to eliminate an imminently dangerous situation to the aircraft, support equipment, and personnel, and will remain in an undisturbed state until the aircraft is released to maintenance by the OSC.

1.1.5. Be prepared to evacuate buildings as instructed by Control Center or Fire Department.

1.1.6. Ensure that all required equipment and personnel are made available to the OSC.

## **2. Terms Explained.**

2.1. Disabled Aircraft – an aircraft that cannot or should not be moved under its own power, but can be towed using its own undercarriage.

2.2. Damaged Aircraft – an aircraft that cannot be removed under its own power or by towing on its own undercarriage without sustaining considerable secondary damage.

## **3. Organizational Responsibilities.**

### 3.1. Maintenance Operations Center (MOC):

3.1.1. The Senior Controller, upon notification of an aircraft mishap requiring recovery of a disabled or damaged aircraft, will comply with MOC controller checklist Tab 3, Major Accident/Mass Casualty and implement QRC-1 (on base) or QRC-2 (off base).

3.1.2. Notify the 436 MXG/CC, shift supervisor on duty for the Repair and Reclamation shop and MXG Quality Assurance. Notification will include the type of aircraft, location of aircraft, amount of fuel on board, explosives on board, and known extent of aircraft damage.

3.1.3. Notify all squadrons' supervision that the crash recovery is underway. Remind them to stay clear of the recovery site unless otherwise directed to assist.

3.1.4. Notify inbound/outbound aircraft and divert to alternate runway as necessary. If necessary, runway will be closed for on base accidents. Coordinate with Tanker Airlift Control Center (TACC).

3.1.5. The Senior Controller will clear one radio net for exclusive use by the recovery team to expedite the recovery operation.

3.1.6. Ensure radio communication is maintained with the designated maintenance representative in case additional personnel and/or equipment are required.

3.1.7. If crossing an active runway and/or taxiway is required to reach recovery site, obtain necessary clearances for maintenance vehicles and request an escort from Archer 3, Excel 3, or a "follow me" escort from Transient Maintenance.

3.1.8. In the event that an aircraft being recovered requires the movement of cargo by way of normal or alternate means, contact 436 OGV (Standardization and Evaluation along with the 436 APS Duty Officer) for offload.

3.1.9. Ensure all appropriate AF and civilian agencies have been contacted (e.g. TACC, HQ AMC/LGRC, weapon system program managers, local environment protection response agencies, etc.).

3.2. Crash Fire Rescue (CFR) Unit:

3.2.1. Obtain on scene responsibility and direct required actions needed to ensure safety of personnel and to stabilize aircraft.

3.2.2. Relinquish responsibility to the OSC after personnel are evacuated from aircraft and the aircraft has been stabilized.

3.3. Explosive Ordinance Disposal (EOD) Unit:

3.3.1. Remove all explosive devices as required.

3.4. Base Safety Office:

3.4.1. Facilitate and assist internal and external investigation agencies as required.

3.5. Base Legal Office:

3.5.1. Provide legal advice to the OSC, including but not limited to the following:

3.5.1.1. Advise the OSC on necessary steps to preserve evidence for any accident or safety investigation.

3.5.1.2. Recommend to the OSC the need to establish a National Defense Area (NDA).

3.5.2. Identify affected property owners and obtain right of entry onto private land, as necessary.

3.5.3. Assess the situation to determine potential third party claims and assess the need for a temporary claims office.

3.5.3.1. Takes steps to establish a temporary claims office, if necessary.

3.5.4. Provide immediate legal services to personnel involved in accident/incident.

3.6. Bio-Environmental Engineers:

3.6.1. Evaluate scene for potential health hazards. Provide assessment to the OSC.

3.6.2. Specify proper personal PPE as required based on assessment.

3.6.3. Brief recovery personnel on all potential hazards as applicable.

3.7. Quality Assurance:

3.7.1. Upon notification from MOC of an aircraft mishap requiring recovery, contact the Quality Assurance OIC, Quality Assurance Superintendent, and all Shift Supervisors. Notification will include the type of aircraft, location of aircraft, amount of fuel on board, explosives on board, and known extent of aircraft damage.

3.7.2. Implement impoundment procedures of aircraft and all aerospace ground equipment (AGE) that may have played a role in the mishap sequence, IAW DAFBI 21-102, *Aircraft Equipment Impoundment*.

3.7.3. Assist in calculating weight and balance of aircraft if required.

3.8. Repair and Reclamation Shop:

3.8.1. Repair and Reclamation shop element of the Equipment Maintenance Squadron will supervise and direct CDDAR duties. This includes the elimination of any imminently dangerous aircraft

hazards within their job scope so that it is safe for investigation board members after coordination of the OSC.

**NOTE:** The Crash Recovery Supervisor will report to and receive orders exclusively from the OSC.

3.8.2. In the event of CDDAR, call EMS Disaster Control Center (EMSDCC) and have them contact Logistics Readiness Squadron (LRS), Vehicle Management Flight Dispatch Office for a tractor-trailer to hook up to crash recovery trailer. In the event the EMSDCC is not yet established, Repair and Reclamation may contact LRS Vehicle Management Dispatch Office directly.

3.8.3. Once notified of a crash through MOC, the shop's shift supervisor will assemble specialized crash recovery teams (e.g. flight control, landing gear, door/visor systems, etc.) and designate a Crash Recovery Supervisor. The shift supervisor will dispatch the team when requested by MOC, EMSDCC, or OSC.

3.8.4. Ensure applicable TO's are available in the event of a crash recovery and reviewed to insure familiarization, i.e., 1C-5A-2-1, *Ground Handling and Servicing* and 1C-5A-3, *Structural Repair Instructions*, paragraph 1-267, "Crash Handling".

3.8.5. The Repair and Reclamation Crash Recovery Supervisor, under direction of the OSC, will perform supervision of the recovery/removal operation.

3.8.6. Maintain the crash recovery trailer/equipment located in building 714.

3.8.7. Periodic inspections will be scheduled to insure serviceability of crash recovery equipment.

3.8.8. Training on CDDAR procedures/equipment will be conducted annually and documented in the individual's training record and G081 database.

3.8.9. Must be prepared to rapidly deploy crash recovery equipment and personnel as deemed necessary by Logistics Readiness Control (LGRC) as per AMCI 21-108, *Logistics Support Operations*.

### 3.9. Aircraft Maintenance Squadron (AMXS):

3.9.1. Provide equipment and personnel, as requested, during the recovery operation.

3.9.2. Provide a fully operational tow vehicle and the most qualified tow vehicle operator on duty when requested during the recovery operation.

3.9.3. Provide crew chiefs to assist Repair and Reclamation shop in rendering the aircraft safe for investigation board members and assist in the recovery operation, i.e., de-fueling and purging, removing batteries, oxygen containers as needed (1C-5A-3 paragraph 1-269).

3.9.4. Perform containment and clean up of fuel-related spills of 20 gallons or less. Fire Department (436 CES/CEF) notification is not required if the product is contained on asphalt, concrete, or other impervious surface unless a threat of human safety or property is present. Report **ALL** spills larger than 20 gallons immediately to the Fire Department as per OPLAN 32-7, *Oil and Hazardous Substance Spill Prevention and Response Plan*.

### 3.10. Transient Maintenance:

3.10.1. Provide equipment and personnel as requested during the recovery operation.

3.10.2. Provide technical orders and assistance during crash recovery and reclamation of transient aircraft.

- 3.10.3. If crossing an active runway and/or taxiway is required to reach recovery site, provide a “follow me” escort to crash recovery detail when requested.
- 3.10.4. Provide personnel qualified to de-fuel and purge, remove batteries and remove oxygen containers of transient aircraft if needed.
- 3.10.5. Provide qualified personnel to support transient aircraft requiring CDDAR that sustained blown or flat tires (see [Table 1](#). for wheel and tire assemblies available on station).
- 3.11. Logistics Readiness Squadron:
  - 3.11.1. Provide necessary transportation for DCG and provide additional vehicles to augment civil engineering forces when requested.
  - 3.11.2. Provide tractor-trailer when requested for the transport of the crash recovery trailer.
  - 3.11.3. Provide vehicle maintenance support to heavy equipment during fuel spill clean up or CDDAR operations when requested by the OSC.
  - 3.11.4. Provide authorization for a special equipment account for containment and clean up equipment specified in OPLAN 32-7.
- 3.12. Civil Engineering Squadron:
  - 3.12.1. Provide additional personnel and equipment as required by the specific incident (i.e. dozers, graders, shoring materials, railroad ties, plywood, gravel, and etc.)
  - 3.12.2. Requirements will be passed to CE through the OSC or designated representative. Assess, control, and remove fuel spills per OPLAN 32-7.
- 3.13. Contracting Squadron:
  - 3.13.1. Fulfill required contracts as requested per OPLAN 0070-1, *Emergency Contract Support*.
  - 3.13.2. Organizations shall use their Government Purchase Card to procure items and services less than \$2,500 in accordance with AFI 64-117, *Air Force Government-Wide Purchase Card (GPC) Program*.
- 3.14. Aerial Port Squadron:
  - 3.14.1. Provide detailed cargo manifest, with complete descriptions of any explosives or hazardous materials to the OSC, DCG, CAT or others as directed.
- 3.15. Aerospace Ground Equipment (AGE) Shop:
  - 3.15.1. AGE equipment assigned to the crash recovery will be maintained by the AGE flight. AGE will inform the Aero Repair Element prior to removing any AGE equipment for inspection and or maintenance. The AGE flight will replace removed AGE with like type equipment if available. Aero Repair will notify AGE with any problems with the AGE crash recovery equipment.

#### 4. Recovery Operations.

- 4.1. The OSC must ensure the security and preservation of any evidence and wreckage.
- 4.2. Before beginning the recovery, the OSC must obtain approval from CFR, EOD, Bio-Environmental Engineer (BEE), and the investigating commander to identify any real or potential hazards to recovery personnel.

4.3. The following factors should be considered to determine how great the need is for rapid recovery.

- 4.3.1. Availability of alternate runways/taxiways.
- 4.3.2. Availability of alternate airports.
- 4.3.3. Position of disabled aircraft relative to aircraft movement areas.
- 4.3.4. Cost of diversions/loss of operations.
- 4.3.5. Military alert commitments.

## 5. Situation Evaluation.

**NOTE:** The first task at a recovery site is to gather information and evaluate the situation. The initial response team will be able to gather much of this data and initiate requests for additional information from appropriate sources.

- 5.1. Gather all necessary information and use to accomplish risk assessment, using Operational Risk Management (ORM).

**NOTE:** Safety, definitions, purpose, scope, and using ORM is the common sense approach to making calculated decisions on human material and environmental factors. It enables those in charge to maximize operational capabilities while minimizing risks at all levels preserving assets and safeguarding health and welfare. Accept no unnecessary risk.

### 5.2. ORM

- 5.2.1. Identify the hazards
- 5.2.2. Assess the risk
- 5.2.3. Analyze risk control measures
- 5.2.4. Make control decisions
- 5.2.5. Implement risk controls
- 5.2.6. Supervise and review

## 6. Recovery Methods.

6.1. Aircraft recovery usually involves seven general steps.

- 6.1.1. Overall assessment, analysis, planning and briefings.
- 6.1.2. Alteration of weight and center of gravity (CG).
  - 6.1.2.1. In the event that an aircraft being recovered requires the removal of cargo by way of normal or alternate means, contact 436 OG/OGV (Stan/Eval along with 436 APS, Duty Officer for offload).
- 6.1.3. Functional and structural assessment of the aircraft.
- 6.1.4. Lifting aircraft.
- 6.1.5. Providing portability to the airframe.
- 6.1.6. Lowering the aircraft.

6.1.7. Movement of the aircraft.

## 7. Briefing.

7.1. After initial planning steps have been completed a briefing will be conducted for all involved recovery personnel. This will allow all involved to begin thinking of various possible hazards and ways to minimize them. Detailed briefings are best broken down into several distinct tasks with one person appointed to be responsible for each task.

7.2. Each team leader must fully understand his/her responsibilities and how they interface with each other.

7.3. Team leaders will brief personnel involved in their task(s).

7.4. Briefings will cover the following topics (as a minimum).

7.4.1. The task to be accomplished (what).

7.4.2. The intended purpose of each task (why).

7.4.3. The sequence of the task (when).

7.4.4. Responsibility for each task (who).

7.4.5. Task accomplishment and coordination (how).

7.4.6. Any known hazards involved.

7.4.7. Evacuation procedures.

7.4.7.1. Personnel will sound an alarm if a serious hazard is seen (whistle, air horn, spot light, or megaphone).

7.5. Ensure personnel have required tools and technical data to identify, reclaim, safe, or secure components in their respective systems.

7.6. Ensure recovery personnel have the following PPE (can be located in Crash Recovery Trailer).

7.6.1. Leather gloves, steel-toed boots, eye protection, if required, Full-Face Respirator and Efficiency (HEPA) Acid Vapor Filter Cartridges, and if required, Tyvek hooded coveralls (disposable type).

**NOTE:** Recovery and removal of the aircraft and aircraft parts will be IAW AFI 91-204, *Safety Investigations Reports* to ensure preservation of evidence for Safety and/or Accident Investigation Boards. Consult and obtain approval from the OSC, Safety and/or Accident Investigation Board president(s), and BEE (to ensure site safety) before initiating recovery/removal actions.

**Table 1. Aircraft Wheel and Tire Assembly and Equipment Availability on Station.**

AIRCRAFT	NOSE WHEEL/TIRES AVAILABLE	MAIN WHEEL/TIRES AVAILABLE	TOW BAR AVAILABLE	AIR BAGS AVAILABLE	FUSELAGE JACKS AVAILABLE	TOW LINKS AVAILABLE
C-5	28	50	YES	YES	YES	YES
C-17	2	6	YES	YES	NO	NO
C-130	0	0	YES	YES	NO	NO
C-141	4	6	YES	YES	YES	NO
KC-10	0	0	YES	YES	NO	NO
KC-135	2	4	YES	YES	NO	YES

7.7. Checklists at [Attachment 2](#) and [Attachment 3](#) (Aircraft Data Checklist and Hazards Checklist) will be accomplished by CDDAR personnel to ensure proper turn-over and evaluation of the crash site.

JOHN I. PRAY JR., Colonel, USAF  
Commander, 436th Airlift Wing

**Attachment 1****GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFI 64-117, *Air Force Government-Wide Purchase Card (GCP) Program*  
AFI 91-204, *Safety Investigations Reports*  
AFMAN 32-4004, Chapter 2, *Emergency Response Operations*  
AMCI 21-101, Chapter 3, *Aerospace Equipment Maintenance Management*  
AMCI 21-108, Chapter 1, *Logistics Support Operations*  
DAFBI 21-102, *Aircraft Equipment Impoundment*  
TO 1C-5A-2-1, *Ground Handling and Servicing*  
TO 1C-5A-3, *Structural Repair Instructions*  
OPLAN 32-1, *Disaster Preparedness*  
OPLAN 32-2, *Standby Emission Plan*  
OPLAN 32-7, *Oil and Hazardous Substance Spill Prevention and Response Plan*  
OPLAN 32-7, Tab 3, *MOC Controller Checklist*  
OPLAN 32-7, *Quick Reaction Checklist 10-1 and EMS Supplement to QRC 10-1*  
OPLAN 32-7, *Quick Reaction Checklist 10-2 and EMS Supplement to QRC 10-2*  
OPLAN 0070-1, *Emergency Contract Support*

***Abbreviations and Acronyms***

**AGE**—Aerospace Ground Equipment  
**AMXS**—Aircraft Maintenance Squadron  
**APS**—Aerial Port Squadron  
**BEE**—Bio-Environmental Engineer  
**CG**—Center of Gravity  
**CES**—Civil Engineering Squadron  
**CFR**—Crash Fire Rescue  
**CRP**—Crash Recovery Program  
**CDDAR**—Crashed-Damaged/Disabled Aircraft Recovery  
**DCG**—Disaster Control Group  
**EMS**—Equipment Maintenance Squadron  
**EMSDDC**—Equipment Maintenance Squadron Disaster Control Center

**EOD**—Explosive Ordinance Disposal

**FOE**—Follow-on-Element

**GPC**—Air Force Government-wide Purchase Card

**HQ AMC**—Headquarters Air Mobility Command

**IRE**—Initial Response Element

**LGRC**—Logistics Readiness Control

**LRS**—Logistics Readiness Squadron

**MOC**—Maintenance Operations Center

**MXG/CC**—Maintenance Group Commander

**MXQA**—Maintenance Group Quality Assurance

**NDA**—National Defense Area

**ORM**—Operational Risk Management

**OSC**—On Scene Commander

**PPE**—Personal Protective Equipment

**QRC**—Quick Reaction Checklist

**TACC**—Tanker Airlift Control Center

**Attachment 2**

**AIRCRAFT DATA CHECKLIST**

- 1. Type and Model \_\_\_\_\_ Mishap Date \_\_\_\_\_ Time \_\_\_\_\_
  - a. Tail Number \_\_\_\_\_
  - b. Empty Weight \_\_\_\_\_
  - c. Total Fuel Load (current) \_\_\_\_\_
  - d. Fuel Load By Tank \_\_\_\_\_
  - e. Cargo Load \_\_\_\_\_
  - f. Flares \_\_\_\_\_

2. Classified Item/Marking \_\_\_\_\_

- 3. Major Structure Condition \_\_\_\_\_
  - a. Landing Gear Intact \_\_\_\_\_

4. Site Information

- a. General Location \_\_\_\_\_
- b. Exact Position \_\_\_\_\_
- c. Type Terrain \_\_\_\_\_
- d. Temperature \_\_\_\_\_
- e. Weather (rain, snow, fog, etc.) \_\_\_\_\_
- f. Wind Speed and Direction \_\_\_\_\_
- g. Weather Forecast \_\_\_\_\_

5. Identification of any Hazards \_\_\_\_\_

**Attachment 3****HAZARDS CHECKLIST**

1. Nuclear Weapons	YES	NO	NA
2. Conventional Weapons	YES	NO	NA
a. Bombs	YES	NO	NA
b. Missiles	YES	NO	NA
c. Ammunitions	YES	NO	NA
3. Fuel	YES	NO	NA
4. Poisonous gases	YES	NO	NA
5. Toxic Chemicals	YES	NO	NA
6. High Pressure Cylinders	YES	NO	NA
7. Ejection Seats	YES	NO	NA
8. Ejection Hatches	YES	NO	NA
9. Corrosive Agents	YES	NO	NA
10. Batteries	YES	NO	NA
11. Composites	YES	NO	NA
12. MSDS as required	YES	NO	NA