BY ORDER OF THE COMMANDER

CHARLESTON AIR FORCE BASE INSTRUCTION 21-3

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Maintenance

CRASH DAMAGED OR DISABLED AIRCRAFT RECOVERY (CDDAR)

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction establishes responsibilities, procedures, and operating instructions for aircraft crash damaged or disabled aircraft recovery for both major and minor incidents in the Charleston AFB area of responsibility to include all host, tenant, and transient aircraft. All agencies involved with recovery operations will ensure compliance with this instruction to ensure a cooperative, coordinated response to CDDAR situations. It applies to all activities under the jurisdiction of the 437th Airlift Wing Commander and can be implemented in conjunction with 437th Airlift Wing (AW) FSTR 10-2, *Full Spectrum Threat Response Plan*.

Charleston AFB may receive requests for military assistance from civil authorities. The 437 AW Commander will direct CDDAR team response if deemed necessary in accordance with AFI 10-801, *Assistance To Civilian Law Enforcement Agencies.*

The general procedures outlined in this instruction apply to all potential and actual emergency landing situations. These procedures also apply to all periodic tabletop exercises conducted to discuss possible responses to a variety of scenarios, assess personnel capabilities, exercise checklists, validate key phone numbers, etc. These exercises will mirror other base major accident response exercises.

The Senior Fire Official (SFO) of the Initial Response Element, acting as the On-scene Commander (OSC), will determine if the incident should be declared a major accident. A major accident would warrant response by the Base Disaster Control Group (DCG) and implementation of FSTR Plan 10-2. The DCG Commander assumes OSC duties after transfer of command from the SFO and directs all activities. All other incidents will be handled by base agencies.

NOTE: All affected organizations must be prepared to rapidly deploy CDDAR equipment and personnel when directed by HQ AMC/XOLC in order to recover AMC assets.

1. Responsibilities:

1.1. The DCG will:

1.1.1. Maintain a list of telephone numbers/websites of key agencies/personnel (e.g. TACC, HQ AMC/XOLC, weapon system managers, local environmental protection response agencies, etc.) that may be required for assistance. The Crisis Action Team (CAT) will ensure appropriate agencies are notified.

1.1.2. Contract for services and materiel needed on-scene as directed by the OSC and coordinate with contractors that are needed to support ongoing operations and are unavailable through normal installation channels IAW 437 AW FSTR Plan10-2.

1.2. 437th Logistics Readiness Squadron (LRS) will:

1.2.1. Inspect the CDDAR trailer once a month and maintain the records. Any maintenance required will be scheduled on a priority basis. If the trailer is moved to any other location, the Maintenance Operations Center (MOC), Aero-Repair element, and LRS will be notified.

1.2.2. Provide a qualified driver and tractor and any other equipment necessary to deliver the CDDAR trailer and equipment to the mishap site.

1.3. The MOC will:

1.3.1. Notify 437th Aircraft Maintenance Squadron (AMXS) & Maintenance Squadron (MXS) Production Superintendents and Quality Assurance of the mishap to include pertinent information.

1.3.2. Ensure radio traffic is held to essential transmissions during emergencies and enforce radio discipline during the recovery operation.

1.3.3. Obtain necessary clearance for maintenance vehicles to cross the active runways or taxiways to reach the recovery site.

1.4. The 437 MXS will:

1.4.1. Appoint the Maintenance Flight Officer in Charge (OIC) as the primary CDDAR officer, and the A/R Element chief as the primary CDDAR supervisor.

1.4.2. Provide any additional specialist support required to recover the damaged aircraft. They will work under supervision of the CDDAR team supervisor.

1.4.3. A/R Element will:

1.4.3.1. Perform CDDAR duties. It will be prepared to perform assigned maintenance duties, assist and provide expertise in CDDAR situations to the CDDAR Supervisor and the OSC.

1.4.3.2. Respond to any incident involving aircraft departing prepared surface IAW Annex A, FSTR Plan 10-2, assess the damage to the aircraft, and accomplish recovery if possible.

1.4.3.3. Respond to ground mishaps involving aircraft damage to assist performing advance composite mishap response procedures IAW CAFBI 21-202, *Advance Composite Mishap Response,* when necessary.

1.4.3.4. Maintain airfield maps readily available in the crash recovery binder.

1.4.3.5. Determine the type and quantity of CDDAR tools, equipment, and personnel required to recover the airframe.

1.4.3.6. CDDAR Supervisor will assume recovery responsibilities and direct and coordinate CDDAR operations when aircraft is released to maintenance by the OSC.

1.4.3.7. Appoint the Team supervisor to initiate CDDAR evaluation check lists and determine necessary actions and dispatch specific required equipment. These initial response check lists will be maintained in the CDDAR book.

1.4.3.8. Notify Weapon System manager, or aircraft owning agency concerning type and condition of aircraft prior to recovery attempt through the CAT.

1.4.3.9. Contact owning pro super to provide situation updates.

1.4.3.10. Maintain respirator protection program qualified personnel for advance composite mishap response procedures outlined in CAFBI 21-202 and TO 1C-17A-3-8, *Disabled Aircraft and Special Maintenance*. Full-face respirators are stored in the 437 MXS Maintenance Flight CTK section.

1.4.3.11. Perform and track inspection, repair, and storage of Crash Recovery equipment to ensure serviceability. A detailed listing of equipment can be found in the CDDAR book. The air lifting bag kits and shoring are stored near the CDDAR trailer, normally located in hangar 532. A forklift and trailer will be required to move the shoring and air bag kits, especially in the event of an off-base response. The MOC will be notified of the location if the CDDAR trailer and equipment is moved.

1.4.3.12. Assist AMXS perform required maintenance on assigned aircraft involving blown or flat tires to clear active runways in a timely manner.

1.4.3.13. Assist AMXS perform required fuel or oil spill containment procedures outlined in MOI 32-1, *Oil and Fuel Spill Containment Procedures,* on assigned aircraft involved in a CDDAR situation.

1.4.3.14. Assist Transient Alert if the aircraft is transient.

1.4.4. Structural Maintenance Section will:

1.4.4.1. Maintain a respirator protection program and list qualified personnel for advance composite mishap response procedures outline in CAFBI 21-202 and TO 1C-17A-3-8.

1.4.4.2. Provide personnel and expertise on structural damage evaluation and repair options to the CDDAR team leader.

1.5. The 437 AMXS will:

1.5.1. Follow aircraft impoundment procedures IAW MOI 5-1, *Aircraft/Equipment Impoundment/ Quarantine.*.

1.5.2. Ensure surrounding aircraft and equipment are removed from possible danger in a timely manner.

1.5.3. Maintain and deliver the emergency spill response trailers and the tire chariots.

1.5.4. Provide any additional manpower required to recover the damaged aircraft. They will work under the supervision of the CDDAR supervisor.

1.5.5. Provide a tow vehicle with tow bar and tow team to stand by during recovery operations. The team will work under direction from the CDDAR supervisor or Pro Super and will remain available for any assistance necessary to aid in further recovery operations.

2. General Procedures:

2.1. In the event of a potential crash situation, the following general procedures will be implemented as well as FSTR Plan 10-2, Annex A is followed.

2.1.1. Initial Response element which includes CEF, SFS, and MDG, will dispatch for primary on-scene coverage.

2.1.2. The MOC will broadcast information on appropriate nets when an aircraft has an in-flight emergency. Information will include type aircraft, nature of emergency, souls on board, estimated time of arrival, runway, and if hazardous cargo is on board. If hazardous cargo is aboard, include class, type, and quantity of hazardous cargo.

2.1.3. A/R will physically respond to all in-flight emergencies and render assistance to clear active runway if necessary.

2.1.4. If the aircraft lands with all gears down and wheels and tires intact, the Production Supervisor and A/R will evaluate the situation to determine if the aircraft can be safely towed to a suitable parking location.

2.1.5. The Aircraft Maintenance Unit (AMU) Production Supervisor will dispatch a tow vehicle, tow bar, and tow team, emergency spill response trailer, and tire chariots to meet the aircraft when necessary. And will consider implementation of aircraft impoundment procedures.

3. Specific Procedures for Blown or Flat Tires:

3.1. If hot brakes are suspected, the aircraft will remain in the designated area for 30 minutes to allow for cool-down time (IAW TO 4B-1-1),*Use of Landing Wheel Brakes and Wheels during Ground Operations.* Ensure all personnel stay clear of an area extending 300 feet in a 45-degree angle on both sides of the remaining wheels until the brakes have cooled or the thermal release plugs have deflated the tires.

3.2. Personnel will approach an aircraft with suspected hot brakes only from a forward or aft direction.

3.3. The SFO will direct a fire vehicle to remain with the aircraft for the allotted cool-down time.

3.4. TO 1C-17A-3-8 contains inspection criteria to be accomplished to determine extent of damage.

3.5. If an aircraft with multiple tire changes is blocking an active runway or taxiway, and full fuselage jacking procedures are determined necessary, all Production Supervisors will place combined effort to redirecting priorities for delivery of aircraft ground equipment. Deliver fuselage jacks and jacking manifold first, then tire chariots and support equipment.

3.6. The owning AMU is responsible for supplying qualified maintenance personnel, tire change kits and other associated equipment required to complete the task. MXS Maintenance Flight A/R personnel will back fill if necessary upon AMU requests for assistance through Maverick 4.

3.7. When the aircraft maintenance is complete, a combined effort will again be required to clear the area of ground equipment in preparation for tow procedures.

3.8. If faulty brake system is suspected, ensure brakes can be released for the towing operation.

4. Procedures for Emergency Removal of Disabled Aircraft from Active Runway or Crash Site:

4.1. Charleston Air Force Base/International Airport has two active runways. If an aircraft crash-lands at the intersection of the two, it will be necessary to clear the aircraft/wreckage as soon as possible to facilitate reactivation of at least one of the runways. **NOTE:** Every crash is different from any other and should be evaluated and handled as each individual situation dictates.

4.2. Ensure the wreckage is removed from the runway in minimum time commensurate with requirements to reopen the runway for operational use, prevent unnecessary secondary damage to aircraft, and preserve evidence for the accident investigation.

4.3. For the purpose of towing the aircraft off the active runway, the team as a minimum, will safe all the landing gears. Immediately upon exiting the active runway, the tow team will stop the aircraft and complete all remaining safeing operations prior to towing the aircraft to its designated parking spot.

4.4. Consult TO 1C-17A-3-8, Chapter 5. Valuable time may be saved by planning the job to completion before starting.

4.5. The CDDAR supervisor and AMXS AMU Production Supervisor are responsible for removal of aircraft at the direction of the OSC, once the aircraft has been determined to be safe to move.

5. Specific procedures for aircraft departing prepared surfaces are contained in TO 1C-17A-3-8, Chapter 5.

6. Specific procedures for major fuel spills are contained in MOI 32-1.

7. Specific Procedures for an Aircraft Crash:

7.1. In the event of an aircraft crash, maintenance group personnel will respond when directed. Many other agencies must be involved to secure the area, provide necessary medical attention, and to catalog, photograph, and investigate the causes and effects of the incidents under 437 AW FSTR Plan 10-2, AFI 91-204, *Safety Investigations and Reports*, and 437 AW SPlan 91-204, *Mishap Response Plan for Flight Mishap Safety Investigation*. This process may last several days. During this time, the OSC may solicit advice from the maintenance response team on how to proceed with the recovery effort. Maintenance's only role is to provide individuals to serve as aircraft experts to locate and identify certain aircraft components, and to assist in determining the possible causes and effects of the crash.

WARNING

Ensure that it is safe to approach the aircraft, all explosives, ejection seat cartridges, tires, fluids, flares, and munitions are de-armed, expended, or otherwise proclaimed safe by the fire department and Explosive Ordnance Disposal (EOD), 3-5289. EOD must be notified for further evaluation before the aircraft can be moved.

Make sure the aircraft remains stable at all times and that personnel use extreme caution when working in and around a disabled aircraft.

Due to the many unknown factors of airframe condition immediately following a crash landing, no attempts to use special equipment or procedures should be attempted without the approval of the specific airframe system manager. The owning agency of any transient aircraft will be contacted for technical advice pertaining to the specific aircraft.

CAUTION

Due to the possibility of deep-seated smoldering of plastics and composite materials, post-fire does not begin until the composite material is at ambient temperature. Fix ant can be applied once all site imminent hazards have been taken care of and the composite temperature is at ambient. Approval may be needed from the SIB before application begins. Composite spray team may need to be escorted if area is not clear of explosives hazards. Recovery operations will not begin until all firefighting and rescue efforts are complete.

Carbon Fibers (CF) act as irritants similar to fiberglass, when present in moderate to heavy amounts. Personnel working with or around CF shall be provided dust masks gloves and eye protection.

7.2. Initiate CDDAR response checklists. Refer to 437 AW FSTR Plan 10-2 and CAFBI 21-202 and initial response checklists to protect personnel, aircraft, or other property from future damage.

7.3. Initiate impoundment procedures IAW MOI 5-1. Refer to 437 AW SPlan 91-204, Table C.

7.4. A/R Element will have the MOC contact the LRS dispatch section for a vehicle and driver to tow the crash recovery trailer. The MOC will notify A/R Element to meet the driver at the trailer location to assist with hooking up the trailer. The crash trailer will then be driven to the assembly point to await further instructions from the OSC.

7.5. To avoid confusion, all essential personnel will meet at Bldg 700 to receive safety briefings and await instructions from the OSC to convoy to the mishap site.

8. Procedures for Landing Gear Failure: In the event of a C-17 gear-up landing condition, consult TO 1C-17A-3-8 for maintenance procedures.

9. During on-base recovery, the CDDAR supervisor will report to the OSC and stand by until authorized to safe the aircraft for recovery.

10. During off-base recovery the CDDAR Officer and CDDAR Supervisor will:

10.1. Respond with the disaster response force after the crash site has been located.

10.2. Determine the personnel and equipment required to remove the wreckage.

10.3. Advise DCG of requirements for personnel, equipment, transportation, and housing when the mishap aircraft has been released for recovery.

11. Equipment, Resources, and Capabilities List

11.1. C-17 Mission Design Series (MDS) parts, wheel & tire assemblies available. No other airframe items maintained in supply.

11.2. Lifting capability: C-17 60-ton tripod jacks (C-5 capable), 15-ton air bags (all aircraft), 26-ton air bags (all aircraft), 40-ton rhino jacks (multiple aircraft), and 35-ton axle jacks (multiple aircraft).

11.3. Tow capability: C-17 tow bar (KC/DC-10 capable), C-17 MLG bridles, C-5 tow bar, KC-135 tow bar, MD-1 Universal tow bar (multiple aircraft), and cable (multiple aircraft).

11.4. Defuel capability: All universal coupler type SPR trucks, suction devices, and gravity drain.

11.5. Technical data: C-17 MDS series.

11.6. C-141 and C-5 tire change CTKs available in Flight Line Tool Section.

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Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INGORMATION

References

AFI 10-801, *Assistance to Civilian Law Enforcement Agencies*

AFI 91-204, *Safety Investigations and Reports*

CAFBI 21-202, *Advance Composite Mishap Response*

437 AW FSTR Plan 10-2, *Full Spectrum Threat Response Plan*

437 AW SPlan 91-204, *Mishap Response Plan for Flight Mishap Safety Investigation*

MOI 5-1, *Aircraft/Equipment Impoundment/Quarantine*

MOI 32-1, *Oil and Fuel Spill Containment Procedures*

TO 1C-17A-3-8, *Disabled Aircraft and Special Maintenance*

TO 4B-1-1, *Use of Landing Wheel Brakes and Wheels during Ground Operations*

Abbreviations and Acronyms

AMU—Aircraft Maintenance Unit

CAT—Crisis Action Team

CDDAR— Crash Damaged or Disabled Aircraft Recovery

CF—Carbon Fibers

DCG—Disaster Control Group

EOD—Explosive Ordnance Disposal

MDS—Mission Design Series

MOC—Maintenance Operations Center

OIC—Officer in Charge

OSC—On-scene Commander

SFO—Senior Fire Official