BY ORDER OF THE COMMANDER
LUKE AIR FORCE BASE

LUKE AIR FORCE BASE
INSTRUCTION 21-114

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Maintenance

CRASH DAMAGED OR DISABLED AIRCRAFT RECOVERY

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This instruction implements Air Force Instruction (AFI) 21-101, *Aircraft and Equipment Maintenance Management* and AFI 21-101 AETCSUP 1, *Aircraft and Equipment Maintenance Management.* This instruction applies to all maintenance and operations personnel assigned to the 56th Fighter Wing, to include Air Force Reserve Command (AFRC) and the Air National Guard (ANG) units. It 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 Senior Fire Official (SFO). The Crash Damaged or Disabled Aircraft Recovery (CDDAR) program is designed to recover crashed/damaged or disabled aircraft in a minimum time period consistent with the following consideration(s): Requirement to open the runway for operational use, prevention of secondary damage to the aircraft and preservation of evidence for mishap or accident investigations in accordance with AFI 91-202, *The US Air Force Mishap Prevention Program* and AFI 91-204, *Safety Investigations and Reports*. 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 AF Forms 847 from the field through the appropriate functional's chain of command. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, for

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SUMMARY OF CHANGES

This revision includes administrative changes throughout and has been substantially revised and must be completely reviewed. The major changes include the addition of requirements established in Technical Order (TO) 00-80C-1 and an annual exercise requirement for all involved base agencies.

1. Overview:

1.1. Purpose.

1.1.1. The 56th Maintenance Group (56 MXG) Commander has the primary responsibility for establishing a CDDAR capability. The 56th Fighter Wing (56 FW) Command Post will coordinate with the following 56 FW agencies for CDDAR response: Fire Department, Maintenance Operations Center (MOC), Quality Assurance (QA), Component Maintenance Squadron (CMS), Civil Engineering Squadron (CES)/Emergency Management Flight, Wing Safety, Medical Squadron, Base Bioenvironmental, Security Forces (SFS), Explosive Ordnance Disposal (EOD), Operations Support Squadron (OSS) Airfield Manager, Logistics Readiness Squadron (LRS), Contracting Squadron (CONS), Comptroller Squadron (CPTS) Force Support Squadron (FSS) and other on/off base agencies as applicable.

1.2. References.

1.2.1. AFI 10-2501, *Air Force Emergency Management Program,* AFI 10-206, *Operational Reporting,* AFI 21-103, *Equipment Inventory, Status, and Utilization Reporting,* AFI 21-101 AETCSUP 1, *Aircraft and Equipment Maintenance Management,* AFI 91-203, *Air Force Consolidated Occupational Safety Instruction,* 48-Series Air Force Occupational Health and Safety Standard (AFOSHSTD), Aircraft specific Dash-2 and Dash-3 series TOs, and TO 00-105E-9, *Aerospace Emergency Rescue and Mishap Response Information,* TO 00-80C-1, *Crashed, Damaged, Disabled Aircraft Recovery Manual,* 56 FW OPlan 10-2, *Installation Emergency Management Plan,* 56 FW OPlan 91-1, *Aircraft Mishap Response Plan.*

2. Responsibilities:

2.1. CDDAR Affiliated Wing Agencies.

2.1.1. All 56 FW Agencies affiliated with the CDDAR process will conduct and participate in annual training and exercises. All exercises will be coordinated with 56 CES, Emergency Management Flight.

2.2. 56th Equipment Maintenance Squadron (56 EMS) CDDAR Team Chief:

2.2.1. Train all personnel assigned to the crash recovery team in accordance with applicable CDDAR lesson plans. To include initial training comprised of both academic and hands on. Training will be documented in the Integrated Maintenance Data System (IMDS) under Course Codes 003840, 022452, 022234, and in employee training records as appropriate.

2.2.2. Ensure that all CDDAR team members are properly trained in/on the following areas: All tools and support equipment for a safe recovery operation (i.e., lifting bags, slings, etc.), proper use of all personal protective equipment (PPE) as determined by the technical data and 56 FW Bioenvironmental Office, composite hazard cleanup, PPE in accordance with applicable AFI and Occupational Safety Health Administration (OSHA) standards and TO 00-105E-9 *Aerospace Emergency Rescue and Mishap Response Information*.

2.2.3. Maintain an applicable CDDAR trailer, for weatherproof storage and mobility, with at least the minimum required equipment authorized by appropriate Table of Allowance.

2.2.4. Maintain all required PPE for CDDAR team members operations and composite recovery as determined by the technical data and 56 FW Bioenvironmental Engineer. CDDAR team contract management is responsible for respirator fit test of their personnel.

2.2.5. Maintain a CDDAR team with the minimum amount of personal to support a CDDAR recovery operation. Additionally, the IC or CDDAR Team Chief may utilize other personnel necessary to accomplish CDDAR operations as required. All additional personnel will be given a safety brief and not used in actual CDDAR operations unless properly trained.

2.2.6. Ensure a fully trained and equipped CDDAR team, to include but not limited to a Team Chief, tow supervisor, tow vehicle operator, and brake rider will be available during airfield operating hours (minimum 4 people). This team will respond to all aircraft in-flight emergencies, ground emergencies and aircraft incident locations as required. Additional CDDAR qualified personnel shall be recalled to meet the requirements of technical data as required. Additional augmentees may be required for lifting operations, to hold guide ropes and assist with moving cribbing or shoring material as required. Augmentees will be aircraft maintenance personnel provided by the 56 MXG. Augmentees will be briefed and trained on their required duties by the CDDAR Team Chief or representative upon arrival.

2.2.7. Will maintain a current recall roster for after normal duty hours and made available to the MOC and the Wing Command Post. The roster will have current assigned personal and telephone numbers. This list will be updated yearly or whenever a change occurs. The Wing Command Post will use the CDDAR Team recall roster for after duty hour's response.

2.2.8. Review all support agreements, response plans and CDDAR Lesson plan annually.

2.2.9. Inform the 56 MXG/CC, in writing, of any equipment shortages/serviceability issues that impact recovery operations.

2.2.10. Ensure that adequate tools and special equipment is serviceable and available for emergency recovery operations and maintain a list of all CDDAR tools and equipment.

2.2.11. Will coordinate with 56 MXG weight and balance manager when weight and center of gravity (CG) conditions are unknown.

2.3. 56 FW Command Post:

2.3.1. During normal duty hours, will implement the appropriate checklist and coordinate with the following agencies for CDDAR response/support: MOC, CMS, CES Emergency Management Flight, Safety Office, Bioenvironmental Office, SFS, OSS Airfield Manager, LRS, CONS, CPTS, FSS, EOD, Base Fire Department and any additional on/off Base Agencies as required.

2.3.2. In the event of an aircraft mishap, initiate Luke AFB IEMP 10-2, ANNEX A, Appendix 2, *Installation Emergency Management Plan*.

2.4. 56 MXG MOC:

2.4.1. Contact all agencies as stated in Checklist #8 and applicable ANNEX in 56 FW OPLAN 91-1, *Aircraft Mishap Response Plan*.

2.4.2. Coordinate all needs of the CDDAR Team via radio or telephone after they have been activated. All requirements will be coordinated with the IC or Fire Chief while at the mishap site.

2.5. 56 MXG QA:

2.5.1. Ensure all procedures and plans are coordinated with all base agencies.

2.5.2. Provide aircraft weight and balance data to CDDAR Team Chief.

2.5.3. Complete 56 FW OPLAN 91-1 MXG/QA Execution checklist as required.

2.6. 56 CMS:

2.6.1. The Hydrazine Response Team will complete the hydrazine leak/Emergency Power Unit (EPU) Activation check list (LCL 56CMS-6) and advise IC of potential hazards.

2.6.2. Mitigate hazards when directed by the IC.

2.7. Bioenvironmental Office:

2.7.1. Will be consulted and directly involved in determining personnel health hazards, training required and appropriate levels of PPE. The Bioenvironmental Office will also make provisions to recall a representative for non-duty hours.

2.7.2. Evaluate the scene for potential health hazards and will provide assessments to the IC. The IC will evaluate risk factors to determine levels of PPE and duration of work/rest cycles taking environmental conditions into account.

2.7.3. Provide constant updated site conditions to IC and CDDAR Team Chief. They will also work with the IC, CDDAR Team Chief and SFS in determining the peripheral area.

2.7.4. 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.

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

2.7.6. Provide respirator training to all recovery personnel in accordance with applicable OSHA and AFOSHSTD directives.

2.8. 56 CES:

2.8.1. Provide manpower and equipment necessary to support the recovery mission as directed by the IC and CDDAR Team Chief. Assist in providing access to crash site and assist in site setup in accordance with Luke AFB IEMP 10-2, *Installation Emergency Management Plan*. They will make provisions to recall a representative for non-duty hours.

2.8.2. Fire Department will respond with appropriate fire truck(s) at mishap site during recovery/salvage operations. A standby fire truck will be on scene during aircraft recovery operations.

2.8.3. EOD will respond (with Fire Department) to aircraft containing hazards (even without ordnance) for evaluation/safing of damaged aircraft weapons systems and ordnance.

2.8.4. Emergency Management will maintain and operate the Mobile Emergency Operations Center (EOC) in response to aircraft accidents and provide advice to the IC and EOC during response and recovery operations.

2.8.5. Coordinate delivery of heavy machinery with operators as determined by the IC and CDDAR Team Chief.

2.8.6. Procure and deliver necessary supplies needed for the recovery/removal operation (i.e., dunnage, plywood, planking, etc.)

2.8.7. When directed by the IC and Safety Investigation Board (SIB), CE will complete a grid survey of the area and identify the location of aircraft parts and human remains.

2.9. 56 CONS:

2.9.1. Procure needed supplies and coordinate with the IC and CDDAR Team Chief for availability and delivery of all emergency requests. They will make provisions to recall a representative for non-duty hours.

2.10. 56 LRS:

2.10.1. At the request of the IC or CDDAR Team Chief, Vehicle Operations will provide support vehicles to transport recovery team members and any other equipment items as required (i.e., 40 foot flatbed semitrailer and tractor, van, truck, etc). They will make provisions to recall a representative for non-duty hours. Vehicle Operations will designate and make provisions for distribution of base vehicle assets to be utilized by the recovery team dependent upon area and terrain.

2.11. 56 FSS:

2.11.1. Provide billeting, meals, ice, water, etc. and any other services as deemed necessary by the IC.

2.12. 56 CPTS:

2.12.1. Establish a fund site to procure needed equipment and supplies necessary in the CDDAR recovery operation.

2.13. 56 SFS:

2.13.1. Establish a cordon area and ECP (entry/exit control point) in conjunction with the Fire Chief, Bioenvironmental Office and IC. The cordon size may expand as the situation warrants.

2.14. 56 FW Range Management Office:

2.14.1. Ensure capabilities exist for the expedited removal of aircraft from the Gila Bend Auxiliary Field runway in the case of aircraft in-flight emergencies. If requirements exceed the capabilities of assign personnel/equipment, the removal will be provided by Luke AFB CDDAR personnel if the aircraft is a host/tenant of the 56 FW.

2.15. 56 OSS Airfield Manager:

2.15.1. Run all applicable mishap check sheets as required.

2.16. 56 FW Command Post:

2.16.1. Will maintain a copy of the current CDDAR Team recall roster. For normal duty hours, Command post will run appropriate checklists. For after normal duty hours, the Command Post will run appropriate checklists and contact the CDDAR Team with the current recall roster.

2.17. 56 FW Safety Office:

2.17.1. Give guidance for preservation of evidence for the SIB. The CDDAR Team Chief will coordinate procedures with the Safety Office as required.

2.18. Transient Aircraft Support:

2.18.1. Luke AFB CDDAR personnel will provide initial emergency response and will provide limited support for damaged aircraft outside their capabilities. The EOC director, or designated representative, will coordinate recovery and salvage operations support with the CDDAR Function. The CDDAR Team Chief will advise the EOC director of their capabilities and limiting factors. The owning organization and Luke CDDAR Team Chief will coordinate resources and personnel needed for recovery and salvage operations for the mishap aircraft.

3. Procedures:

3.1. In the event of a crashed/disabled aircraft, 56 FW OPlan 10-2, *Installation Emergency Management Plan* and 56 FW OPlan 91-1, *Aircraft Mishap Response Plan*, will be implemented and all applicable check sheets will be started. MOC will notify the CDDAR Team Chief to assemble the CDDAR team. After the activation of the CDDAR team the following agencies will implement the appropriated steps:

3.2. CDDAR Team Chief:

3.2.1. Coordinate with IC, SIB or safety representative, as applicable, to determine what needs to be accomplished and when the CDDAR team will be needed to enter the area.

3.2.2. Evaluate the site with the IC and Bio Environmental office to determine what PPE and recovery equipment will be required for entry into the area.

3.2.3. Assemble the CDDAR team in the Transient Alert shop. Brief all personnel on the site condition, review individual responsibilities of team members and set up work schedule for personnel.

3.2.4. Review all safety precautions and ensure all assigned personnel have proper PPE equipment that is available and required.

3.2.5. Once directed by the IC to conduct recovery procedures, make aircraft safe for recovery operations, configure aircraft, and begin recovery/removal actions. The recovery operation shall take place in accordance with all applicable technical data and in accordance with AFI 91-204, *Safety Investigations and Reports*, to ensure preservation of evidence.

3.3. Bioenvironmental Office:

3.3.1. Prior to recovery operation, all team members will be respirator fit tested. Provide means to fit test personnel at incident location as required. This will be based on the recovery operation and appropriate PPE Level.

3.3.2. Recommend appropriate PPE to be used in recovery of aircraft, debris, and remains.

3.3.3. Continue to monitor environmental conditions at site during recovery and advise CDDAR Team Chief of any recommended changes to PPE.

3.4. 56 CES:

3.4.1. Implement 56 FW OPlan 10-2, *Installation Emergency Management Plan*, and provide manpower and equipment necessary to support the CDDAR recovery mission.

3.4.2. Obtain materials as required (plywood, shoring, planking, etc.), for CDDAR recovery operation.

3.4.3. Construct necessary temporary facilities as required to support the CDDAR recovery operation.

4. In-Flight Emergency (IFE) and Ground Emergency (GE) Procedures:

4.1. Upon notification of an IFE or GE, the CDDAR supervisor and primary CDDAR response crew will switch to Crash/Fire frequency on the maintenance radio and continue monitoring this channel until termination of the emergency by the SFO.

4.2. A CDDAR team will respond to all aircraft in-flight and ground emergencies upon notification via the secondary crash telephone. Response actions to an aircraft GE will be contingent on the nature of the emergency and/or location of the aircraft. Should the CDDAR function be unable to respond to any GE, they will notify the SFO.

4.3. The CDDAR vehicle will position near the SFO. When positioning near the SFO vehicle, use caution not to block response route of firefighting/emergency vehicles.

4.4. The CMS Hydrazine Response Team will respond to all potential EPU activation IFEs. Hydrazine Response vehicle will be positioned near the SFO and respond upon request. The Hydrazine Response Team will complete the Hydrazine leak/EPU Activation check list and notify the SFO of completion.

4.5. The SFO will declare the aircraft is fire safe prior to allowing CDDAR personnel to safe the aircraft. Emergency response personnel will not approach the main wheels from the sides if hot brakes are suspected. Under no circumstances will CDDAR personnel enter the area until declared fire safe by the SFO.

4.6. Once cleared by SFO for normal engine shutdown, CDDAR personnel will pin and shutdown aircraft per the applicable maintenance data series technical orders. For emergency engine shutdown, once cleared by SFO, the Fire Department will shut down the aircraft, pin the EPU and Gun in accordance with IAW TO 00-105E-9, *Aerospace Emergency Rescue and Mishap Response Information*.

4.7. The SFO, in coordination with the Supervisor of Flying (SOF), will determine if the emergency aircraft can be taxied off the runway prior to engine shutdown.

4.8. Barrier Engagement: After the SFO declares the aircraft fire safe, CDDAR Supervisor will signal to the pilot to retract the arresting hook and shutdown aircraft as required.

4.8.1. CDDAR supervisor will coordinate with the SFO on the most expedient method of removing the aircraft from the barrier to ensure complete cable disconnection. Once the barrier cable is cleared from the arresting gear, Fire Department personnel will coordinate cable rewind with barrier maintenance personnel.

4.9. In-flight Uncommanded Engine Shutdown/Flameout: The CDDAR team will safe the aircraft and tow it off the active runway or taxiway to the closest available area out of the CMA and out of the path of taxiing aircraft.

4.10. Brake Failure: CDDAR personnel will chock walk the aircraft off the active runway with assistance from the owning aircraft maintenance unit, time permitting. If the situation does not permit chock walking (i.e., double in-flight emergencies in-progress), the aircraft will be removed in a safe manner.

4.10.1. The CDDAR team will tow the aircraft from the active runway or taxiway to the closest available area out of the CMA and out of the path of taxiing aircraft.

4.10.2. The owning organization or unit will be responsible for towing the aircraft back to its maintenance facility or aircraft parking spot.

4.10.3. The CDDAR team will return to the shop and resume stand-by CDDAR posture.

4.11. Procedures for Detected/Suspected Hot-Brakes:

4.11.1. Upon notification of a ground emergency for an aircrew detected/suspected hot brake condition, CDDAR personnel will respond with the Fire Department and await instructions from the SFO.

4.11.2. Verification of a hot brake condition rests solely on the Fire Department personnel at the aircraft. (This does not apply to hot brake conditions identified by either aircraft maintenance personnel on their parking ramp or inspection personnel in the end of ramp inspection area.

4.11.3. The SFO will respond to the location of the aircraft and dispatch personnel to perform hot brake check to verify the temperature of the brakes. If a hot brake condition does not exist, the aircraft will be allowed to taxi. If a hot brake condition does exist, fire department personnel will continue with hot brakes procedures.

4.11.4. Under the following circumstances, a hot brake condition can be declared by the aircrew in coordination with the SOF or SFO. If conditions are favorable for a hot brake condition (heavy landing, excessive brake use or other factors) a hot brake condition will be declared. If new brakes are suspected on the aircraft causing them to smoke the SFO will contact the appropriate agency to verify the brake status. If new brakes are verified, the SFO will clear CDDAR personnel to check the condition of the brakes.

4.11.5. The primary method for checking hot brakes will be done with an electronic thermometer.

4.12. When a hot brake condition is verified:

4.12.1. The aircrew will adhere to procedures outlined in applicable Aircraft Flight Manuals (F-16) or Expanded Emergency Procedures (F-35) and proceed to shut down the aircraft.

4.12.2. Non-essential personnel will evacuate to a minimum 300-foot radius from the aircraft. The primary danger is along the lateral axis of the wheel. Upon aircraft shutdown, the nose tire will be chocked and the aircrew will be extracted by fire department personnel.

4.12.3. Fire Department will provide a minimum of one stand-by aircraft rescue fire fighting vehicle during the cooling period in case of fire or explosion.

4.12.4. Aircraft brakes will be checked periodically until they cool sufficiently enough for the aircraft to be turned over to maintenance personnel.

4.12.5. Upon termination of the hot brake condition and ground emergency the owning aircraft maintenance unit is responsible for towing the aircraft back to the parking ramp.

4.13. The CDDAR supervisor will maintain a log for all in-flight/ground emergencies. Information recorded will include time of emergency, type of emergency, all difficulties or delays encountered. This log will be reviewed daily by the section supervisor to identify and correct any existing problem areas. Any unusual circumstances, delays in removing aircraft from runways, or demands for unauthorized procedures will be reported to 56 EMS Maintenance Supervision and contracting offices representative.

5. Aircraft Non-Emergency Response Procedures:

5.1. Upon notification from the tower of an aircraft blocking the active runway, the CDDAR supervisor and primary response crew will switch to tower frequency on the maintenance radio net and continue monitoring this channel until the aircraft has been cleared of the active runway and the tower has been notified.

5.2. CDDAR Team:

5.2.1. A CDDAR team will respond to all aircraft blocking the active runway upon notification from the tower. (When the CDDAR team is not available, the Tower will coordinate with Base Operations to escort a tow vehicle from the respective Aircraft Maintenance Unit (AMU). The CDDAR team will tow the aircraft from the active runway to the closest available area out of the CMA and out of the path of taxiing aircraft. Owning organization or unit will be responsible for towing the aircraft back to its maintenance facility or aircraft parking spot.

5.2.2. Tower will ensure all aircraft give way to CDDAR team responding to aircraft blocking active runway. If a subsequent ground emergency occurs, the CDDAR team will respond to the ground emergency prioritized by the SFO. For dual occurrence of non-emergency incidents, tower will prioritize incident response in coordination with the SOF and direct the CDDAR team's response.

BROOK J. LEONARD, Brigadier General, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 10-2501, *Air Force Emergency Management Program*, 19 Apr 16

AFI 10-206, *Operational Reporting*, 11 Jun 14

AFI 21-101, *Aircraft and Equipment Maintenance Management*, 21 May 15

AFI 21-101 AETCSUP 1, *Aircraft and Equipment Maintenance Management*, 23 Oct 12

AFI 21-103, *Equipment Inventory, Status, and Utilization Reporting*, 26 Jan 12

AFI 24-302, *Vehicle Management*, 26 Jun 12

AFI 91-202, *The US Air Force Mishap Prevention Program*, 24 Jun 15

AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, 15 Jun 12

AFI 91-204, *Safety Investigations and Reports*, 12 Feb 14

AFMAN 33-363, *Management of Records*, 1 Mar 2008

Adopted Form

AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFRIMS—Air Force Records Information Management System

AMU—Aircraft Maintenance Unit

CDDAR—Crash Damaged or Disabled Aircraft Recovery

CES—Civil Engineer Squadron

CMA—Controlled Movement Area

CMS—Component Maintenance Squadron

CON—Contracting Squadron

CPTS—Comptroller Squadron

EMS—Equipment Maintenance Squadron

EOC—Emergency Operations Center

EOD—Explosive Ordinance Disposal

EPU—Emergency Power Unit

FSS—Force Support Squadron

FW—Fighter Wing

GE—Ground Emergency

IAW—In Accordance With

IC—Incident Commander

IMDS—Integrated Maintenance Data System

IFE—Inflight Emergency

LRS—Logistics Readiness Squadron

MOC—Maintenance Operations Center

MXG—Maintenance Group

OPR—Office of Primary Responsibility

OSHA—Occupational Safety Health Administration

OSS—Operations Support Squadron

PPE—Personal Protective Equipment

RDS—Records Disposition Schedule

SIB—Safety Investigation Board

SFO—Senior Fire Official

SFS—Security Forces Squadron

SOF—Supervisor of Flying