

**BY ORDER OF THE COMMANDER
RAMSTEIN AIR BASE**

**RAMSTEIN AIR BASE
INSTRUCTION 21-119**

9 NOVEMBER 2012

Maintenance

**CRASH, DAMAGED OR DISABLED
AIRCRAFT RECOVERY PROGRAM**



COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This wing instruction is required by Air Force Instruction (AFI) 21-101, *Aircraft and Equipment Maintenance Management*, paragraph 3.2.6., and AFI 21-101_COMBATAIRFORCESUP (USAFE)_I, *Aircraft and Equipment Maintenance Management*. This instruction implements Air Force Policy Directive (AFPD) 91-2, *Safety Programs*; and supports AFI 91-202, *The US Air Force Mishap Prevention Program*, paragraph 7.4.5. It also implements applicable aircraft -2 and -3 Technical Orders (TO), TO 00-105E-9, *Aerospace Emergency Rescue and Mishap Response Information* and the Consolidated Kaiserslautern Military Community Plan 10-2 *Comprehensive Emergency Management Plan*. This instruction applies to all 86 Airlift Wing (AW) and tenant units by establishing responsibilities and procedures for the recovery of crashed, damaged or disabled aircraft on the active runway, adjoining taxiways or immediate vicinity as required by wing mission plans and local host-tenant agreements. 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 Form 847s 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 Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/gcss-af61a/afirms/afirms/>.

SUMMARY OF CHANGES

Minor changes were made to this instruction during its conversion from AFI21-101_86AWGM2 to this instruction. Recent changes in AFI 21-101 are covered in this instruction to include guidance on in flight emergency (IFE) coverage.

1. FUNCTIONAL RESPONSIBILITIES:

1.1. This instruction governs the 86 AW's responsibilities in the response to Crashed, Damaged or Disabled Aircraft Recovery (CDDAR). The CDDAR program is established to recover damaged or disabled aircraft in minimum time to return Ramstein Air Base to operational status as soon as practical after a mishap.

1.2. The CDDAR program is delegated to the 86th Maintenance Squadron (MXS). The operation and management will be consistent with the following considerations:

1.2.1. The requirement to reopen the runway for operational use.

1.2.2. Prevention of secondary damage to the aircraft.

1.2.3. Preservation of evidence for mishap or accident investigation in accordance with (IAW) AFI 91-202 and AFI 91-204, *Safety Investigations and Reports*.

1.2.4. Safety of personnel involved with recovery operations.

1.2.5. If requested CDDAR team will assist Safety Investigation Board/Flight Safety/ Incident Commander (IC) in the search for or preservation of Cockpit Voice Recorder/Flight Data recorder data.

1.2.6. IAW AFI 91-204, when an aircraft is under investigation by the Interim Safety Investigation Board, recovery operations will not proceed until the board president releases the aircraft. Personnel who are not engaged in the investigation will remain outside of the recovery area. The crash recovery team may be called upon to perform tasks as required by the investigation team.

1.2.7. The CDDAR program instruction is procedural and will not take precedence over aircraft specific technical data in recovery of crashed, damaged, or disabled aircraft.

1.3. 86 MXS Maintenance Flight will:

1.3.1. Maintain crash recovery equipment with an inventory of specialized crash recovery tools, equipment, and current technical orders to meet expected crash recovery operations. CDDAR equipment is stored in building 2217.

1.3.2. Provide personnel required to perform CDDAR operations.

1.3.3. Provide primary and alternate Crash Recovery Team Chiefs (CRTC).

1.3.4. Respond to IFEs by assembling a tow team and pre-position the tow team. Depending on runway the IFE aircraft is landing, the following locations will be used for pre-positioning the tow team:

1.3.4.1. Runway 09-27 – North Crash Access Road at taxiway Echo outside the controlled movement area (CMA)

1.3.4.2. Runway 08-26 – Southside of airfield, Ramp 8 area outside the CMA

1.3.5. Repair & Reclamation (R&R) Section will:

1.3.5.1. Manage the CDDAR program and ensure personnel are trained in recovery operations.

1.3.5.2. Conduct Crash Recovery Team (CRT) member training. Selected personnel will be trained for emergency and nonstandard towing procedures, standard and nonstandard aircraft lifting procedures, wear of personal protective equipment (PPE), and broken and fire-damaged composite material containment, handling, and disposal.

1.3.5.3. Establish a crash recovery and composite material handling training program. CDDAR personnel will accomplish annual training on Ramstein AB assigned mission design series (MDS) aircraft. Actual aircraft emergencies can be substituted for the required training.

1.3.5.4. Ensure CRT members are respirator fit tested by Bioenvironmental Engineering (BIO) and receive annual recertification.

1.3.5.5. Maintain a current recall roster of all CRT personnel.

1.3.5.6. Provide a CRT as required to conduct CDDAR operations IAW applicable aircraft technical orders and local checklists.

1.3.5.7. Respond to all aircraft barrier engagements with the assistance of 86 MXS Transient Alert.

1.3.6. The CRT will:

1.3.6.1. Provide the IC with a roster of CRT personnel.

1.3.6.2. Be responsible for ensuring the aircraft is moved to the predetermined location, safely and expeditiously, using all resources available.

1.3.6.3. Maintain complete control of the aircraft and the removal procedures until it is moved to a predetermined location.

1.3.6.4. Maintain a continuity binder containing at a minimum, PPE guidelines, crash recovery checklists, event logs, equipment, and tool inventories.

1.3.6.5. Perform crash recovery equipment serviceability inspections before and after each exercise and use.

1.3.6.6. Perform inventory of all equipment and expendable items before and after each exercise and use. As a minimum, document the inventory semi-annually.

1.3.6.7. Be prepared to provide equipment or personnel to assist with emergency tows.

1.3.6.8. Ensure applicable 86 AW organizations and tenant units participate in CDDAR exercises and training.

1.4. 86 MXS Aerospace Ground Equipment (AGE) Flight will maintain and deliver serviceable AGE required to perform CDDAR operations (See Attachment 3).

2. SUPPORT: 86 AW units will provide manpower and/or equipment, as required, to support the CRT. The following units will provide MDS-specific manpower and/or equipment for training and crash recovery, as required, by the CRTC:

2.1. 86th Aircraft Maintenance Squadron (AMXS) will support aircraft crash recovery as required by the CRTC.

2.1.1. Provide maintenance representatives and/or manpower to provide technical advice relative to safety, operation, or environmental hazards, when requested by the CRTC.

2.1.2. Respond to all emergency tow situations in the event an aircraft without structural damage requires removal from the active runway, to include in-flight emergency situations, hot brakes, blown or flat tires. See flight line Quick Reaction Checklist 7 and 9.

2.1.3. Request assistance from 86 MXS for any emergency tow when additional equipment or personnel are required.

2.1.4. Provide defuel assistance for 86 AW assigned aircraft when requested by the CRTC.

2.2. 86 MXS Transient Alert will assist base crash recovery, fire department and munitions teams on emergencies involving transient aircraft as directed by recovery team chief or on-scene commander, to include barrier re-certifications.

2.2.1. Assist with aircraft hot brakes inspections as directed by the crash recovery team chief or on-scene commander.

2.3. 86th Maintenance Operations Squadron (MOS) will coordinate contractor support for incidents involving assigned C-20, C-21, C-37 and C-40 aircraft.

2.4. The 86th Maintenance Operations Center (MOC) will:

2.4.1. Notify 86 MXS/86 AMXS during IFE barrier engagement and hot brake conditions. (Primary notification is by Airfield Management via Secondary Crash Net). If R&R cannot be reached after normal duty hours, contact 86 MXS Maintenance Supervision to determine CRT response.

2.4.2. Assist the senior on-scene maintenance representative by coordinating with other units and/or agencies as required.

2.4.3. Notify the 86 MOS Plans, Scheduling and Documentation Section to gain possession of crashed aircraft's jacket file forms per AFI 21-103, *Equipment Inventory, Status and Utilization Reporting*

2.5. 86 MXG Quality Assurance (QA) will:

2.5.1. Ensure all aircraft Air Force Technical Order (AFTO) Form 781 series documentation/historical records, servicing equipment, personal training records are impounded upon notification of an accident/mishap to Ramstein assigned aircraft.

2.5.2. Inform the MOC, GO81, Graphical User Interface (GUI) Data Base Manager (DBM) to lock out (isolate) GO81, GUI on the affected aircraft.

2.5.3. Coordinate with transient aircraft home station QA to ensure the applicable Maintenance Information System is locked out (isolated) on the affected aircraft.

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

2.6. 721 AMXS will:

2.6.1. Provide minimum team of 10 people, for training and recovery of Air Mobility Command (AMC) aircraft (i.e., C-5, C-17, KC-10, KC-135, 747B, MD-11, etc.) and assist crash recovery operations with crew chief and specialist support. Provide tow team and tow vehicle as required per AMC/USAFE Command to Command Agreement, to support the CRT. Provide defuel assistance for AMC aircraft when requested by the CRT. Take charge of all emergency tow situations in the event an aircraft without structural damage requires removal from the active runway, to include IFE situations, hot brakes, blown or flat tires.

2.6.2. Respond to AMC aircraft IFEs by assembling a tow team. The tow team will standby for further direction from first responders via 721 AMXS MOC.

2.6.3. The 721 AMXS MOC will notify the appropriate headquarters and owning organization after initial response by the CRT. In the event a wide-bodied aircraft becomes disabled at Ramstein AB, the 721 AMXS will notify 618 TACC/XOCL Scott AFB, Illinois DSN 312-779-0363 and also request assistance through the major command.

2.6.3.1. Coordinate with the incident aircraft's home station to ensure all aircraft AFTO Form 781 series documentation/historical records, servicing equipment, personal training records are impounded upon notification of an accident/mishap.

2.6.4. The 721 Aerial Port Squadron (APS) Contract Officer Representative (721 APS/TROQ), DSN 479-4401, will coordinate with the on-station operations handling agent and owning airline for recovery assistance of civilian aircraft.

2.7. 86th Civil Engineer Group will provide emergency response actions IAW the Consolidated Kaiserslautern Military Community, Plan 10-2 *Comprehensive Emergency Management Plan*.

2.8. 569 USFPS will provide security forces personnel to secure mishap scene and the wreckage assembly point, as directed by the IC should the incident occur/spread outside of Ramstein AB perimeter. If an incident occurs within the Ramstein Air Base perimeter, the 86 SFS will provide security forces personnel to secure the mishap scene and the wreckage assembly point.

2.9. 86th Vehicle Readiness Squadron will:

2.9.1. Provide tractor trailers and forklifts, as necessary, to transport CDDAR support equipment to the mishap site, as well as transport wreckage to the wreckage assembly point. Depending on the mishap site conditions, an all-terrain forklift may also be required.

2.9.2. Provide maintenance support to heavy equipment participating in the recovery operation, as directed by the IC.

2.10. 86th Logistics Readiness Squadron will provide on-scene fuel servicing of recovery support equipment, to include AGE and heavy equipment.

2.10.1. In accordance with AFI 23-201 the fuels flight will maintain an aircraft crash sample kit and will respond to any request from the Incident commander to draw samples. Sampling and sample submission will be accomplished IAW TO 42B1-1.

2.10.2. Request for fuel support will be coordinated through Fuels Service Center, DSN 480-5821/5822

3. PROCEDURES. All accident response agencies are notified according to Consolidated Kaiserslautern Military Community, Plan 10-2 *Comprehensive Emergency Management Plan*. Upon declaration of a potential or actual major aircraft accident on the runway or off base, including water recovery, the following sequence of events will occur:

3.1. Upon notification of an aircraft mishap requiring recovery of a damaged or disabled aircraft the 86 MOC will:

3.1.1. Notify 86 MXS Maintenance Supervision of the requirement to recall and assemble the CRT at a designated point.

3.1.2. Ensure the first maintenance responders to the aircraft pull the cockpit voice recorder circuit breakers if aircraft is deemed safe by the IC.

3.1.3. Upon request of the IC or maintenance, contact the transient aircraft home base and request TO guidance for aircraft recovery operations.

3.1.4. The IC will coordinate and request that the MOC dispatch the CRT team via a designated safe route to the accident scene.

3.1.5. In the event that an aircraft recovery requires movement of cargo by normal or alternate means, contact 721 APS/TR at DSN 479-4407.

3.2. The 86 MXS Maintenance Supervision will execute the CDDAR team recall procedures and pass along all known information.

3.3. The CRT will:

3.3.1. Assemble CRT at a designated meeting area with immediate response equipment.

3.3.2. Notify MOC of assembly completion time.

3.3.3. Brief the CRT on the situation, possibility of human remains and importance of not touching or disturbing human remains or aircraft wreckage, as well as all known safety hazards.

3.3.4. Monitor the designated crash net, review safety procedures and aircraft TOs, and stand by until requested by IC to proceed to the accident scene.

3.3.5. Respond to the accident scene when requested, obtaining approval from IC or safety representative and confirm with Bioenvironmental Engineering to ensure the area is safe for entry.

3.3.6. Obtain verification from the IC and Explosive Ordnance Disposal (EOD) representative that all explosive items have been made safe or removed as applicable.

3.3.7. Assess site with IC, configure aircraft and begin recovery/removal actions.

3.4. Designated individuals from the mishap aircraft organization will ensure the following ground handling procedures are complied with:

3.4.1. Disconnect batteries.

3.4.2. Drain oil/fuel from tanks if required.

3.4.3. Remove liquid oxygen if required.

3.5. When responding to a disabled aircraft with hot brakes and/or barrier engagement, the CRTC will coordinate with the base fire department and/or RABI 13-203, chapter 5 *Aircraft Hot Brakes Response* to ensure the aircraft is in a safe condition before proceeding with removal procedures.

3.5.1. The aircraft will sit for 30 minutes to allow adequate time for brake cool down. All personnel will approach the aircraft from a forward or aft direction, until the brakes have cooled.

3.6. Crash Recovery operations in difficult to reach areas will be coordinated through the IC and Emergency Operations Center (EOC). Several base resources may be needed to ensure the appropriate equipment and personnel can be taken to the crash site in a timely manner.

3.7. All personnel entering the crash site will wear proper PPE in accordance with the site safety and health plan. Units are responsible to provide their personnel with proper PPE. **NOTE:** Recovery and removal of 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.

CHARLES K. HYDE, Brigadier General, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFMAN 32-4004, *Emergency Response Operation*, 1 Dec 1995

AFOSHSTD91-100, *Aircraft Flight Line –Ground Operations and Activities*, 1 May 1998

AFOSHSTD91-501, *Air Force Consolidated Occupational Safety Standard*, 7 July 2004

TO 00-105E-9, *Aircraft Emergency Rescue Information*, Revision 11, 1 Feb 2006

AFI 21-101, *Aircraft and Equipment Maintenance Management*, 26 July 2010

AFI 21-101_COMBATAIRFORCESUP(USAFE)_I, *Aircraft and Equipment Maintenance Management*, 28 Dec 2010

AFI 21-103, *Equipment Inventory, Status and Utilization Reporting*, 9 Apr 2010

AFI 91-204, *Safety Investigations and Reports*, 24 Sep 2008

AFI 91-204_USAFESUP, *Safety Investigations and Reports*, 29 Oct 2008

Consolidated Kaiserslautern Military Community, *Plan 10-2 Comprehensive Emergency Management Plan*. 1 Oct 2003

Prescribed Forms

None

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

AB—Air Base

AFI—Air Force Instruction

AFM—Air Force Manual

AFOSH STD—Air Force Occupational Safety and Health Standard

AFPD—Air Force Policy Directive

AFRIMS—Air Force Records Information Management System

AFTO—Air Force Technical Order

AGE—Aerospace Ground Equipment

AMC—Air Mobility Command

AMXS—Aircraft Maintenance Squadron

APS—Aerial Port Squadron

AW—Airlift Wing

BIO—Bioenvironmental Engineering
CDDAR—Crashed, Damaged, or Disabled Aircraft Recovery
CES—Civil Engineering Squadron
CMA—Control Movement Area
CRT—Crash Recovery Team
CRTC—Crash Recovery Team Chief
DBM—Database Manager
EOC—Emergency Operations Center
EOD—Explosive Ordinance Disposal
GUI—Graphical User Interface
IAW—In Accordance With
IC—Incident Commander
IFE—In Flight Emergency
LRS—Logistics Readiness Squadron
MDS—Mission Design Series
MOC—Maintenance Operations Center
MOS—Maintenance Operations Squadron
MXS— Maintenance Squadron
NCAR—North Crash Access Road
PPE—Personal Protective Equipment
QA—Quality Assurance
R&R—Repair and Reclamation
RDS—Records Disposition Schedule
SFS—Security Force Squadron
SOMR—Senior on-scene maintenance representative
TO—Technical Order
USAFE—United States Air Forces in Europe
USFPS—United States Forces Police Squadron

Attachment 2**MINIMAL CRASH RECOVERY TEAM POSITIONS AND DUTIES ¹****A2.1. Crash Recovery Supervisor/Team Chief**

A2.1.1. Coordinate, lead, direct crash recovery operation, including placement of equipment

A2.1.2. Brief safety and scenario situation/concerns

A2.1.3. Assist agency officials in recovery method determination

A2.1.4. Assemble information from Bioenvironmental and Fire Department officials on site hazards and brief team members

A2.2. Inflation Bag Control Console Operator

A2.2.1. Inspect, monitor and operator control console before and during lifting operation

A2.2.2. Direct hose to inflation bag connections during inflation and deflation operations

A2.2.3. Assist in equipment placement, removal and area clean up

A2.2.4. Spreader beam guide line operator during crane lift

A2.3. Observer

A2.3.1. Monitor aircraft height/plumb bob during lifting and report back to Team Chief/Console operator

A2.3.2. Assist in equipment placement, removal and area clean up

A2.4. Equipment Custodian

A2.4.1. Monitor, control and issue all dispatched crash recovery equipment

A2.4.2. Clean, inventory and account for issued equipment/material

A2.4.3. Assist team as needed

A2.5. Equipment Handlers

A2.5.1. Assist in dunnage/cribbing/jack placement

A2.5.2. During bag lift, monitor bag/jack progress

A2.5.3. Assist in equipment placement, removal and area clean up

Notes: (1) *Requirements for C-130, C-21, C-20, C-37, C-40, or wide body aircraft will require additional members supplied by the 721 AMXS, contractors or 86 AMXS*

Attachment 3

MINIMUM CRASH RECOVERY EQUIPMENT/VEHICLE LIST

Table A3.1. MINIMUM CRASH RECOVERY EQUIPMENT/VEHICLE LIST

Small Aircraft.(less than 75K, C-21 etc.) list	Medium Aircraft (75K-200K, C-130 etc.)	Large Aircraft (over 200K, C-17, KC-135 etc.)
1. 3ea Wheel dolly 2. 1ea Spill response kit 3. 2ea Lifting sling 4. 6ea Airbag 15 Ton 5. 1ea MC-7 Air Compressor 6. 6ea Control Console 7. 1ea Crane/Spreader bar 8. 1ea Crash Trailer 9. 1ea 15K Forklift 10. 1ea 40' Low boy trailer w/tractor (vehicle ops) 11. 1ea General purpose-radio equipped truck 12. 1ea Aircraft tow vehicle	1. 4ea Tethering Kit 2. 1ea Spill Response Kit 3. 2ea Lifting sling 4. 1ea MC-7 Air Compressor 5. 8ea Airbag 26 Ton 6. 8ea Control Console 7. 1ea Crane/Spreader bar 8. 1ea Crash Trailer 9. 1ea 15K Forklift 10. 1ea 40' Low boy trailer w/tractor (vehicle ops) 11. 1ea General purpose-radio equipped truck 12. 1ea Aircraft tow vehicle	1. 8ea Tethering Kit 2. 1ea Spill Response Kit 3. 2ea Lifting sling 4. 1ea MC-7 Air Compressor 5. 8ea Airbag 26 Ton 6. 8ea Control Console 7. 1ea Crane/Spreader bar 8. 1ea Crash Trailer 9. 1ea 15K Forklift 10. 1ea 40' Low boy trailer w/tractor (vehicle ops) 11. 1ea General purpose-radio equipped truck 12. 1ea Aircraft tow vehicle
Small Aircraft.(less than 75K, C-21 etc.) list	Medium Aircraft (75K-200K, C-130 etc.)	Large Aircraft (over 200K, C-17, KC-135 etc.)

Notes:

1. These are minimum requirements and should not be assumed all-encompassing. (Add MDS-specific as required).
2. This list should not cause lowered Allowable Source Code requirements.

Assumptions:

1. Additional time may be required to obtain necessary equipment that is not listed.
2. Common equipment (i.e. aircraft jacks, tow bars, generator, light cart, heater) is not listed but may be required depending on conditions of the crash site.
3. Crash Recovery vehicles need to be assigned or identified in pre-plan.
4. This list does not include ancillaries (i.e. dunnage, hand tools, PPE, consumables).