

## Appendix C

# Sample SOP for Battlefield Aircraft Recovery and Evacuation

This appendix can assist in developing an AVUM or AVIM SOP. It provides a generic format and information on battlefield aircraft recovery and evacuation. Aircraft recovery is an operation that results from an aircraft being involved in a forced landing because of mechanical or battle damage. The aircraft also may have been disabled as the result of an accident or component/system malfunction. The operation includes an assessment, repair, and flyout if possible. It may include recovery by aerial or ground means to an appropriate maintenance facility for repair. The aircraft may eventually return to service, which is normally conducted by the AVUM. Maintenance evacuation is the physical act of moving a nonflyable aircraft from one maintenance location on the battlefield to another. Movement may be either by aerial or ground means. Evacuation is to effect repair, cross-level maintenance workloads, or relieve units of disabled aircraft during tactical moves. The AVIM normally conducts a maintenance evacuation.

Aircraft recovery and maintenance evacuation are closely related. In each case, the aircraft must be rigged for lift by helicopter or rigged for lift by a crane device and secured aboard a ground vehicle. Aircraft recovery, however, requires extensive coordination. It is usually time sensitive to the tactical situation. Evacuation, on the other hand, may not have the same urgency. It is usually coordinated between maintenance activities.

This appendix is only a guide. It can be modified for both an AVUM and AVIM organization. In actual practice, the procedures outlined might be modified or augmented based on unit composition. The modification would account for the size of the force; availability of aerial and ground assets; manpower; time and distance considerations; and, above all, the tactical situation.

### **BATTLEFIELD AIRCRAFT RECOVERY AND EVACUATION**

#### 1. References:

- a. FM 3-04.500 (1-500).
- b. FM 3-04.513 (1-513).
- c. TM 1-1520 series.
- d. TM 55-1520 series.
- e. Recovery kit manuals.

2. Purpose: To ensure required information is obtained to organize and execute—
  - a. An aircraft recovery at the AVUM level.
  - b. An aircraft recovery at the AVIM level.
  - c. An aircraft evacuation between the AVUM and AVIM level.
  - d. An aircraft evacuation between an AVIM and another AVIM organization
  - e. An aircraft evacuation between an AVIM and a depot organization.
3. General:
  - a. The owning unit has primary responsibility for aircraft recovery.
  - b. If the owning unit is unable to recover its own aircraft, aircraft recovery support will be requested from the AVIM company.
  - c. The owning unit of the downed aircraft has total responsibility for security of the site.
4. Responsibilities:
  - a. Aviation unit maintenance (AVUM).
    - (1) SOP.
    - (2) Team.
    - (3) Security.
    - (4) Fly away.
    - (5) Request
  - b. Aviation intermediate maintenance (AVIM).
    - (1) SOP
    - (2) Backup support.
    - (3) Team.
    - (4) Security.
    - (5) Fly away.
    - (6) Request.

c. Aviation maintenance officer (AMO).

- (1) Company/Troop level.
- (2) Battalion/Squadron level.
- (3) Brigade/Regiment level.
- (4) Division level.
- (5) Corps level.
- (6) Theater level.

5. Procedures:

a. AVUM:

(1) AVUM unit performing the aircraft recovery will obtain the following information:

(a) Site recovery officer.

- (1) Type and serial number of aircraft.
- (2) Location of aircraft (six-digit grid). Eight-digit grid preferable.
- (3) Air-to-air/ground frequency/call sign in effect.
- (4) Type of security in the area.
- (5) General condition of aircraft (crashed, precautionary landing, partially destroyed or intact).

(b) Complete a DA Form 2407 (Maintenance Request) for the aircraft recovery with the information listed below:

- (1) Type and serial number of aircraft.
- (2) Location of aircraft (six-digit grid). Eight-digit grid preferable.
- (3) Air-to-air/ground frequency/call sign in effect.
- (4) Type security in the area.
- (5) General condition of aircraft (crashed, precautionary landing, partially destroyed, or intact).
- (6) Location where the aircraft is to be delivered.

(7) Release from brigade safety office or accident investigation board.

(c) Complete an aircraft recovery mission data sheet (see page C-19 for example).

(d) Turn in data sheet to the AVUM unit production control office.

(2) AVUM units requesting aircraft recovery and evacuation support submit the following information to the AVIM production control officer:

(a) Site recovery officer.

(1) Type and serial number of aircraft.

(2) Location of aircraft (six-digit grid). Eight-digit grid preferable.

(3) Air-to-air/ground frequency/call sign in effect.

(4) Type of security in the area.

(5) General condition of aircraft (crashed, precautionary landing, partially destroyed, or intact).

(b) Complete a DA Form 2407 (Maintenance Request) requesting aircraft recovery and/or evacuation.

(1) Type and serial number of aircraft.

(2) Location of aircraft (six-digit grid). Eight-digit grid preferable.

(3) Air-to-air/ground frequency/call sign in effect.

(4) Type security in the area.

(5) General condition of aircraft (crashed, precautionary landing, partially destroyed, or intact).

(6) Location where the aircraft is to be delivered.

(7) Release from brigade safety office or accident investigation board.

(c) Complete an aircraft recovery mission data sheet. (See page C-19 for example.)

(d) Turn in data sheet to the AVIM support unit production control office.

b. AVIM:

(1) AVIM production control officer will obtain the following information from the AVUM unit requesting support for either an aircraft recovery or evacuation.

(a) Site recovery officer.

(1) Type and serial number of aircraft.

(2) Location of aircraft (six-digit grid). Eight-digit grid preferable.

(3) Air-to-air/ground frequency/call sign in effect.

(4) Type of security in the area.

(5) General condition of aircraft (crashed, precautionary landing, partially destroyed, or intact).

(b) Complete DA Form 2407 requesting aircraft recovery.

(1) Type and serial number of aircraft.

(2) Location of aircraft (six-digit grid). Eight-digit grid preferable.

(3) Air-to-air/ground frequency/call sign in effect.

(4) Type security in the area.

(5) General condition of aircraft (crashed, precautionary landing, partially destroyed, or intact).

(6) Location where the aircraft is to be delivered.

(7) Release from brigade safety office or accident investigation board.

(c) Complete an aircraft recovery mission data sheet. (See page C-19 for example.)

(d) Develop a recovery team data sheet. (See page C-20 for example.)

6. Courses of action.

a. Abandon the aircraft. Personnel, aircraft, and equipment are highly vulnerable throughout the recovery phase because of threat or inaccessibility.

b. Destroy the aircraft. Aircraft cannot be recovered and is in danger of enemy capture.

c. Recover and evacuate the aircraft. Move the aircraft to an occupied and the secure area or the nearest maintenance facility, incurring as little damage as possible.

7. Reasons for abandonment of aircraft.
  - a. Crash area is inaccessible to aircraft or surface vehicles.
  - b. Damaged aircraft is not worth recovering because of crash or fire damage.
  - c. Combat situation will endanger the safety of the recovery crew.
  - d. Weather conditions.
8. Procedures for abandonment.
  - a. Remove all classified equipment and records.
  - b. Remove all weapons.
  - c. Remove all ammunition.
  - d. Remove communication equipment.
  - e. Remove all loose equipment (first aid kits, fire extinguisher, and toolbox).
  - f. Remove all unit property.
  - g. Mark aircraft for abandonment.
  - h. Remove manufacturer's data plate.
9. Destruction – Authority (SOP/OPORD) – selectively cannibalize; then destroy the aircraft.
  - a. Priorities of destruction.
    - (1) Priority must be given to destruction of classified equipment and associated documents.
      - (a) Identification, friend or foe (IFF) equipment.
      - (b) Classified electronics equipment – KY-58, KIT-1A/C, KY-75, KY-100, AN/ALQ-136, AN/ALQ-144, AN/APR-39, AN/AVR-2, and aircraft survivability equipment (ASE).
      - (c) Publications /Documents.
    - (2) When lack of time prevents complete destruction of equipment, priority should be given to the destruction of essential parts.
      - (a) Installed armament.
      - (b) Engine assembly.

- (c) Instruments, radios, and electronic equipment.
  - (d) Airframe/Flight controls.
  - (e) Electrical, fuel and hydraulic systems.
- b. Methods of destruction.
  - (1) Explosives.
  - (2) Fire.
  - (3) Mechanical means.
  - (4) Other means.
- 10. Safety:
  - a. The owning unit is responsible for obtaining a release from the brigade safety office or accident investigation board before recovery operations. If AVUM requests AVIM support, provide copy of the release to the AVIM production control officer.
  - b. Night recoveries will be made only in exceptional circumstances and then only with the approval of the commanding officer of the AVUM company, AVIM company, or higher headquarters.
- 11. Priority means of recovery – Recovery officer or battle damage and assessment repair (BDAR) assessor determines the method to be used:
  - a. Flyout method: Complete on-site repair or component change, thus, returning the downed aircraft to an operational status for a one-time flight.
  - b. Aerial/Ground recovery (based on METT-TC).
- 12. Recovery team – Downed aircraft recovery team (DART)/Augmentation of DART with BDAR personnel:
  - a. Qualified aircraft maintenance officer or maintenance test pilot.
  - b. Aircraft technical inspector – Performs the duties as the aircraft rigging inspector/certifier.
  - c. Trained aircraft mechanic/rigging crew.
  - d. Medical personnel (if available or needed, combat life saver).
  - e. Security force.
- 13. Organization – the size and composition of the recovery team will depend on:

- a. Type and condition of disabled aircraft.
  - b. Method of recovery.
  - c. Accessibility.
14. Three-phase training period.
- a. Individual.
  - b. Group.
  - c. Team.
15. Receive training on team equipment:
- a. Type equipment.
  - b. General equipment.
  - c. Environment.
16. Considerations.
- a. Location of downed aircraft.
  - b. Assessment of damage to aircraft.
  - c. Tactical situation and proximity of the threat.
  - d. Time available (planning time for AVUM, preparation and rigging: 30 to 60 minutes, which may vary based on METT-TC).
  - e. Aerial versus surface recovery.
  - f. Weather.
  - g. Assets available.
  - h. Fighter management.
17. Courses of action:
- a. To make combat repairs, defer further maintenance, or return aircraft to service.
  - b. Make repairs for one-time evacuation and fly the aircraft to an appropriate maintenance area or safe/secure area.
  - c. Recover the aircraft by surface means.



- d. Recover the aircraft by aerial means.
  - e. Selectively cannibalize, destroy, or abandon the aircraft according to pertinent SOP, Army regulations, field manuals, technical manuals, and other governing regulations.
18. Upon arrival at the site of a disabled aircraft:
- a. Eliminate fire hazards.
  - b. Remove occupants (based upon guidance by qualified medical personnel).
  - c. Remove classified items and equipment records.
  - d. Disconnect batteries.
  - e. Remove weapons.
  - f. Remove ammunition.
  - g. Drain fuel, as required.
19. One-time evacuation method – The pilot should be proficient in all emergency procedures for that particular aircraft.
- a. Advantages.
    - (1) Quick.
    - (2) Economical.
    - (3) Further damage to aircraft is minimized.
  - b. Disadvantages:
    - (1) Requirement for a clear takeoff path.
    - (2) Possibility of unseen damage caused during the crash.
    - (3) Requirement for special tools and equipment.
    - (4) Effects of weather conditions.
20. Aerial recovery/sling load:
- a. Advantages of aerial recovery.
    - (1) Less disassembly is required than for surface transportation.

(2) Accessibility of the disabled aircraft.

(3) Faster than surface.

b. Disadvantages of aerial recovery.

(1) Possibility of dropping the disabled aircraft and inflicting further damage.

(2) Effects of the rotor downwash on the sling load.

(3) Possibility of damage to the recovery helicopter because of improper rigging or equipment malfunction.

(4) Availability of recovery kits and lift assets.

21. Surface recovery – Precautions and special considerations: Air defense, minefields, likely enemy avenues of approach, perimeter defense, and convoy escort:

a. Advantages.

(1) A takeoff path is not required.

(2) The chance of total loss because of further damage to aircraft is reduced.

b. Disadvantages:

(1) Often causes damage to aircraft.

(2) Is slower than aerial recovery or flyout.

(3) Requires more disassembly.

(4) Requires accessible ground routes.

(5) Requires a more thorough reconnaissance of the route.

(6) May require increased security of the route.

(7) Requires mobile assets.

(8) Requires crane or lifting device.

22. Recovery preparations – To be performed at the site of the disabled aircraft, including making the recovery area accessible, using communications correctly, and making the aircraft secure, safe, and ready for recovery or flyout.

a. Accident investigation (do not recover until aircraft is released).

b. Pickup site (police area).

- c. Communications (ground, air team, aviation operations (AO) commander (Cdr)).
  - d. Signaller (needs to be standardized).
  - e. Aircraft battery.
  - f. Removal and salvage of equipment – loose equipment /troops seats, litters, radios, and other basic components to reduce weight or shift center of gravity (CG). Classified equipment should be retrieved if possible.
  - g. Fuel drainage/ventilation.
  - h. BDAR kits.
  - i. Technical manuals.
  - j. Expendable materials (rags, safety wire, tape, fuel and oil sample bottles, and tubes).
  - k. Spill response kit.
  - l. General mechanics tools box.
  - m. Special tools.
  - n. Technical inspector's (TI's) kit.
  - o. Parts – identify specific repair parts needed.
  - p. Ground guides.
23. Equipment.
- a. Individual weapon with basic load.
  - b. Crew served weapon with basic load.
  - c. Nuclear, biological, and chemical (NBC) survey/decon equipment.
  - d. Communication equipment – ground, air, and AO Cdr.
  - e. Signal operating instructions (SOI).
  - f. Tactical maps with appropriate overlays and compass.
  - g. PGPS, SLUGGR/SAGGR.
  - h. Rations/water.

- i. Pyrotechnics/signals.
  - j. Vehicles.
24. Aerial Recovery.
- a. Load description (type aircraft).
    - (1) Weights.
      - (a) Empty.
      - (b) Combat.
      - (c) Unarmed/armed.
    - b. Dimensions.
      - (1) Length.
      - (2) Height.
      - (3) Blades – on/folded/removed.
    - c. Type lift aircraft.
      - (1) Weights.
        - (a) Empty.
        - (b) Combat.
        - (c) Unarmed/armed.
    - d. Required material from recovery kit.
      - (1) Aerial Recovery Kit (ARK) – Technical manual.
      - (2) Interim-Unit Maintenance Aerial Recovery Kit (I-UMARK) – Operator's manual.
      - (3) Helicopter Recovery Kit (HERK) – Shipping manuals.
      - (4) Unit Maintenance Aerial Recovery Kit (UMARK) – Operator's manual.
    - e. Other required materials.
      - (1) Tape.
      - (2) Tools.

- (3) Radio.
  - (4) Axes.
  - (5) Sandbags – ballast.
  - (6) Flashlights.
  - (7) Applicable technical manuals for aircraft or component disassembly.
- f. Aircraft preparation – to be performed at the site of the disable aircraft.
- (1) Disconnect battery.
  - (2) Disarm and unload weapons.
  - (3) Main rotor blades – remove or fold in stowed position.
  - (4) Secure tail rotor blades.
  - (5) Remove any critical components that may be damaged during recovery.
  - (6) Drain fuel.
- g. Rigging – Breakaway technique.
- (1) Bellyband suspension method.
  - (2) Rotor head suspension method.
  - (3) Hard point attachment sling.
  - (4) Attitude-controlled, rotor head suspension.
  - (5) Attitude-controlled, tandem hook, rotor head suspension.
- h. Hookup
- (1) Ground crew protective equipment.
    - (a) Identification (ID) tags.
    - (b) Goggles.
    - (c) Earplugs.
    - (d) Shockproof gloves.
    - (e) Survival knife.

- (f) Helmet.
- (g) Static discharge wand.
- (h) Flashlight with wand.
- (i) Gloves (leather, working).
- (j) Smoke grenade.

(2) Ground crew function.

- (a) Prepare aircraft.
- (b) Approach guidance.
- (c) Signal.
- (d) Static discharge.
- (e) Hookup.
- (f) Rendezvous point.
- (g) Extended sling system operations.

i. Liftoff.

- (1) Flight parameters (As specified in TM and recovery aircraft - 10).
  - (a) Max speed – optimum speed.
  - (b) Max angle of bank.
  - (c) Rate of climb and descent.

j. After use inspection and packing.

- (1) Cleaning of equipment.
- (2) Repacking of drogue chute.
- (3) Removal of flashlight and radio batteries.
- (4) Replacement of equipment.

k. Prepare aerial recovery after action report (AAR):

- (1) Recovery unit and phone number.

- (2) Date.
- (3) Type of aircraft recovered.
- (4) Condition of recovered aircraft.
- (5) Conditions at recovery site (if combat conditions, so state).
- (6) Recovery team composition (by number and MOS)
- (7) Method of recovery (bellyband; rotor head; hard point attachment; attitude-controlled, rotor head suspension; or attitude-controlled, tandem hook, rotor head suspension).
- (8) Narrative of recovery (time required, failures, and shortcomings noted in equipment, remarks, recommendations).
- (9) Send to—

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ATTN: ATZQ-TDS-DD  
Fort Rucker, Alabama 36362-5000**

25. Surface recovery.
  - a. Load description.
    - (1) Weights.
      - (a) Empty.
      - (b) Combat.
      - (c) Unarmed/armed.
  - b. Dimensions.
    - (1) Length.
    - (2) Height.
    - (3) Blades – on/folded/removed
  - c. Required material from recovery kit.
    - (1) Aerial Recovery Kit (ARK) – Technical manual.

- (2) Interim-Unit Maintenance Aerial Recovery Kit (I-UMARK) – Operator’s manual.
- (3) Helicopter Recovery Kit (HERK) – Shipping manuals.
- (4) Unit Maintenance Aerial Recovery Kit (UMARK) – Operator’s manual.
- d. Support equipment.
  - (1) Crane.
  - (2) Flatbed trailer.
  - (3) Tractor.
- e. Other required materials.
  - (1) Tape.
  - (2) Tools.
  - (3) Radio.
  - (4) Axes.
  - (5) Sandbags – ballast.
  - (6) Flashlights.
  - (7) Applicable technical manuals for aircraft or component disassembly.
- f. Aircraft preparation – to be performed at the site of the disable aircraft.
  - (1) Disconnect battery.
  - (2) Disarm and unload weapons.
  - (3) Main rotor blades – remove or position longitudinal.
  - (4) Secure tail rotor blades.
  - (5) Remove any critical components that may be damaged during recovery.
  - (6) Drain fuel.
- g. Rigging – Breakaway technique.
  - (1) Bellyband suspension method.
  - (2) Rotor head suspension method.



(3) Hard point attachment sling.

h. Hookup

(1) Ground crew protective equipment.

(a) ID tags.

(b) Goggles.

(c) Earplugs.

(d) Gloves.

(e) Survival knife.

(f) Helmet.

(h) Flashlight with wand.

i. After use inspection and packing.

(1) Cleaning of equipment.

(2) Removal of flashlight and radio batteries.

(3) Replacement of equipment.

j. Prepare surface recovery after action report (AAR):

(1) Recovery unit and phone number.

(2) Date.

(3) Type of aircraft recovered.

(4) Condition of recovered aircraft.

(5) Conditions at recovery site (if combat conditions, so state).

(6) Recovery team composition (by number and MOS)

(7) Method of recovery – Surface or aerial (bellyband; rotor head; hard point attachment; attitude-controlled, rotor head suspension; or attitude-controlled, tandem hook, rotor head suspension).

(8) Narrative of recovery (time required, failures, and shortcomings noted in equipment, remarks, recommendations).

(9) Send to—

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Fort Rucker, Alabama 36362-5000**

## AIRCRAFT RECOVERY MISSION DATA SHEET

1. PERSON CALLING \_\_\_\_\_
2. TYPE ACFT \_\_\_\_\_
3. ACFT TAIL NUMBER \_\_\_\_\_
4. LOCATION \_\_\_\_\_
5. TIME \_\_\_\_\_
6. EXTENT OF DAMAGE \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
7. PARTS REQUIRED, NSN, QTY \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
8. TYPE RECOVERY KIT REQUIRED \_\_\_\_\_
9. MAINTENANCE TEST PILOT REQUIRED \_\_\_\_\_
10. ENEMY ACTIVITY \_\_\_\_\_
11. AREA SECURED BY \_\_\_\_\_
12. CREW MEMBERS REMOVED \_\_\_\_\_
13. AMMUNITION ABOARD \_\_\_\_\_
14. NBC STATUS \_\_\_\_\_
15. CLASSIFIED DOC/SECURE EQUIPMENT \_\_\_\_\_
16. DISPOSITION OF ACFT RECORDS \_\_\_\_\_
17. SPECIAL INSTRUCTIONS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
18. POC AT SITE AND CALLSIGN/FREQ \_\_\_\_\_
19. UNIT POC AND CALL SIGN/FREQ \_\_\_\_\_

Figure C-1.



# RECOVERY TEAM DATA

RECOVERY TEAM LEADER \_\_\_\_\_  
METHOD OF RECOVERY \_\_\_\_\_  
TRANSPORTATION TO ACFT SITE \_\_\_\_\_  
DEPARTURE TIME \_\_\_\_\_  
EXTERNAL EQUIPMENT SUPPORT REQUIRED \_\_\_\_\_  
\_\_\_\_\_  
POC AT SITE AND CALL SIGN/FREQ \_\_\_\_\_  
\_\_\_\_\_  
POC IN REAR AREA AND CALL SIGN/FREQ \_\_\_\_\_  
\_\_\_\_\_  
FINAL BRIEF TIME \_\_\_\_\_  
SPECIAL INSTRUCTIONS \_\_\_\_\_  
\_\_\_\_\_  
DELIVER ACFT TO \_\_\_\_\_  
\_\_\_\_\_

## METHOD OF RECOVERY (IN ORDER OF PRECEDENCE)

1. ON-TIME FLIGHT
2. REPAIR FOR ONE-TIME FLIGHT
3. SLING LOAD
4. GROUND RECOVERY
5. RECOVER AT LATER TIME

Figure C-2.