AIRCRAFT RECOVERY AND BATTLE DAMAGE ASSESSMENT

AIRCRAFT RECOVERY

Equipment supporting combat operations is normally repaired forward as rapidly as possible; however, sometimes this is not possible. Commanders must plan for recovery operations in cases where aircraft are not repairable in the operations area. When damages exceed the immediate repair capabilities of maintenance units, including BDAR procedures, the aircraft must be recovered.

Aircraft recovery operations move inoperable aircraft from the battlefield to a maintenance collection point (MCP) or maintenance unit location. Aircraft that cannot be repaired for self-powered recovery from the down site are moved directly to the first appropriate MCP or maintenance activity by another aircraft or surface vehicle. In contrast to aircraft recovery, aircraft evacuation is the movement of an inoperable aircraft between maintenance points to a higher echelon of maintenance. This normally occurs when, in consideration of METT-T, necessary repairs to aircraft are beyond the capability of the lower echelon of maintenance.

FM 1-513 provides detailed procedures for preparing and performing aerial recovery operations for specific aircraft.

FM 1-103 provides doctrinal guidance for commanders and staff, for corps through maneuver battalion. Included are the Army’s requirements, procedures, and command and control tasks involved in planning, coordinating, and executing the airspace control function.

Aircraft recovery is the responsibility of the operational aviation unit, using its AVUM element within the limits of its organic lift capability. Supporting AVIM units provide backup recovery support when recovery is beyond the AVUM team’s capability. Successful recovery operations require a highly coordinated effort between the owning organization, its AVIM support, the ground element in whose area the recovery will take place, and any organization that may provide aircraft or vehicle assets to complete the recovery. Overall control of the recovery rests with the TOC of the aviation brigade.

Recovery operations and, to a lesser degree, maintenance evacuations, are easily detected and subject to attack by enemy forces, regardless of combat intensity.

Command, control, and coordination to support aircraft recovery operations are planned in advance within the context of the size of the force and the density of recovery assets at the disposal of commanders. Aircraft recovery procedures are included in unit SOPs, contingency plans, operation orders, and air mission briefings.

Recovery operations in the NBC environment pose special risks to personnel which can be minimized through the wearing of protective clothing by the recovering crew at the scene of the disabled aircraft. Also, the receiving crew at the maintenance site should wear protective clothing because of possible contamination of the disabled aircraft, the recovering aircraft, and rigging sets.

Night recovery operations increase hazards and the need for security. Increased risk must be weighed against the urgency considering time, weather, and the tactical situation.

Recovery Team

Each AVUM organization will prepare for aircraft recovery contingencies by designating an aircraft recovery team. The team is dispatched to downed aircraft sites as the situation requires and as the intensity of the conflict allows. Capabilities and decisions for recovery missions on the hostile side of the FLOT differ considerably from those on the friendly side. The recovery team consists of maintenance personnel, a maintenance test pilot, an aircraft assessor, and a technical inspector. All will be trained to prepare aircraft for recovery. The team chief ensures that appropriate rigging and recovery equipment is kept ready for quick-notice recovery missions. The team’s size and composition depend on the type and size of disabled aircraft, type of recovery aircraft or vehicle, and length of time the recovery area will be accessible. At times dictated by local circumstances, one team may function as both the BDAR team and the recovery team, performing both functions.
Recovery Method

If a downed aircraft cannot be flown out under its own power, the recovery team assumes the mission and implements the best method of recovery—surface or air.

Surface

Surface recovery and evacuation uses ground equipment and wheeled vehicles to move disabled aircraft to an MCP or maintenance facility. Planning a surface recovery follows these logical steps:

- Evaluate the downed aircraft.
- Decide the equipment and transportation needed to recover it.
- Perform a thorough reconnaissance and evaluate available ground routes to and from the recovery site.

Then expand these steps to include characteristics of the recovery site and special tactical considerations; for example—

- Likely enemy avenues of approach.
- Minefields and actions to minimize the danger of booby traps in downed aircraft.
- Tactical cover.
- Need for troop or aerial escort to protect against ambush.

Advantages. Surface recovery restricts the enemy’s ability to detect movement of recovery assets to an area relatively close to the movement routes. It can be used when weather conditions prohibit flight. Also, the threat of total loss of the aircraft during transport because of recovery equipment malfunction is low.

Disadvantages. Surface recovery may tie up route security assets badly needed elsewhere. The time needed for surface recovery is much greater than for aerial recovery. Recovery personnel and equipment assets are tied up for long periods. This relatively high exposure time on the battlefield with slow-moving equipment increases the threat. Also, a significant amount of aircraft disassembly or modification is often required to adapt the aircraft to surface travel; for example, the shortening of height dimensions to accommodate overhead road clearances or the fabricating of extensions for trailers because the aircraft wheelbase is too wide. Ground routes must be accessible, and meticulous reconnaissance of the route is required. Loading procedures and travel on rough terrain can cause further damage to the aircraft.

Aerial

Aerial recovery involves attaching the aircraft to suitable airlift recovery equipment, connecting it to the lifting helicopter, and flying it to the MCP or maintenance area. Again, planning for this type of recovery entails thorough analysis of the recovery site and the threat associated with relatively slow air movement over a battlefield. Medium-lift helicopters will be required for heavier-type aircraft aerial recoveries.

Advantages. Aerial recovery reduces the time recovery assets are tied up and exposed to the battlefield. Route reconnaissance and security escort requirements are considered less, as is the need for aircraft disassembly. Recovery site accessibility requirements are not as rigid. The distance from which recovery assets may be obtained is much greater.

Disadvantages. The possibility exists for complete loss of aircraft through failure of recovery equipment. Although exposure time is less, the distance from which recovery activities are detectable is much greater. Loss of recovery assets through enemy action will more severely degrade total force fighting capabilities. This is due to the multiuse value and relative low density of airlift helicopters, particularly medium-lift helicopters, compared to ground recovery vehicles.

OUTLINE FOR AIRCRAFT RECOVERY AND EVACUATION

(Head the SOP with the names of the organization and the station, the date, and the SOP number.)

Purpose

Responsibilities

- Owning unit (AVUM)
  - Commander
  - Maintenance officer
  - Recovery team
  - BDAR team
- Supporting unit (AVIM)

Training Requirements

Recovery Operations

Safety Considerations
BATTLE DAMAGE ASSESSMENT AND REPAIR (BDAR)

During combat operations, situations arise that make expediting normal maintenance procedures imperative. In such cases, the unit commander will authorize the use of BDAR procedures. BDAR is an AVUM-level responsibility, with backup from supporting AVIM units. The concept uses specialized assessment criteria, repair kits, and trained personnel. It modifies peacetime aircraft maintenance standards to safely return damaged aircraft to battle as soon as possible. Often, such return-to-battle repairs will be temporary, necessitating future permanent follow-up actions when the tactical situation permits. The BDAR system is designed to multiply force capability in a combat environment by augmenting the existing peacetime maintenance system.

The following discussion defines BDAR requirements and procedures at the AVUM level. Similar actions apply to AVIM BDAR teams when used as backup support.

Team Composition and Materiel

The BDAR team is formed from AVUM platoon assets. A typical team includes a trained inspector for damage assessment, two or three repairers (MOS 67/68), and a maintenance test pilot. The actual composition of a team given a specific BDAR mission depends on the type and extent of maintenance work anticipated.

The team will use BDAR manuals containing revised aircraft damage assessment criteria and repair procedures. These manuals are formally processed and validated publications for use in combat environments only, as authorized by the unit commander. Each type of aircraft has its own BDAR manuals that provide—

- Combat damage inspection and assessment techniques.
- Combat area maintenance serviceability and deferrability criteria.
- Cannibalization techniques that permit quick, efficient removal of critical components and structures from unrecoverable and nonrecoverable aircraft.

The BDAR team will be provided with specially designed combat repair kits for repairing major aircraft systems. With the tools and materials in these kits, team members can make quick, temporary combat-damage repairs. Kits are man-portable (suitcase-sized).

Procedures

When an aircraft is forced down, the aircraft commander, or one of his crew, will use the aircraft radio (if operable and the tactical situation permits) to notify the parent AVUM commander of the problem and request BDAR assistance. This information may have to be relayed through other aircraft operating in the area as time and security allow. The crew takes the first step in the assessment process by providing the AVUM commander with key critical information on the problem. The information should include—

- Location of down site.
- Assessment of site security.
- Adaptability of the site, including existing weather conditions, for the insertion of a BDAR team.
- An evaluation of aircraft damage, to the extent possible, so that needed BDAR personnel, equipment, and parts requirements can be estimated.
- Information on crew and passenger condition to determine their capability to assist in repairing the damage. For example, the aircraft commander may be able to fly the aircraft out, eliminating the need for an aviator on the BDAR team.

Initial Inspection

The AVUM unit commander authorizes dispatch (normally airlift) of a BDAR team with manuals, repair kits, materials, and repair parts to the site.

The team’s initial on-site inspection determines the actual extent of damage. It also provides information needed to determine which of the following alternatives apply:

- Clear the aircraft for immediate return to battle, deferring any damage repairs to a later time.
- Make permanent repairs, returning the aircraft to a completely serviceable condition.
- Make temporary repairs that will allow safe return of the aircraft to meet immediate battle
needs, deferring higher-standard permanent repairs to a later time.

- Repair the aircraft to allow a onetime flight back to a more secure and better resourced MCP or maintenance area.
- Rig aircraft for aerial recovery and make necessary recovery arrangements (repair not feasible at repair site).
- Cannibalize critical components and abandon or destroy aircraft (repair or recovery not feasible). The decision to destroy an aircraft will be based on the possibility of an abandoned aircraft failing into enemy hands.

Assessor

A trained assessor will assess aircraft battle damage. One of the assessor’s primary tasks is to determine the location of the damaged aircraft relative to the battlefield and the extent of the threat. Modern air defense threats may make aerial recovery in forward areas of the battlefield an impractical or unacceptably high risk. The ability to determine rapidly that a onetime flight is feasible or that a quick-fix repair is possible is important. It may prevent a situation where the aircraft would otherwise be destroyed (in place) to prevent capture by, or compromise to, the enemy. Once the battle subsides, maintenance decisions are based on standard operational maintenance practices. It must be emphasized that deferment of maintenance tasks is a “fly now, pay later” concept. Postponing maintenance, where feasible, will provide the combat commander with increased availability for short periods only.