



Disabled Aircraft Recovery Pre-Incident Planning



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Overview

- The Problem
- Legal Aspects
- Planning
- Fraport Aircraft Recovery Services



The Problem

Runway closure, even for short periods of time result in....

- aircraft diversions
- creates havoc in the airspace
- causes flight delays
- significant loss of revenue to the airport operator and airline

Professional aircraft recovery preparedness is a must for efficient airport operations

Is your organization adequately equipped, organized and prepared for aircraft recovery?



Definition

Disabled Aircraft: Any aircraft that is unable to move under its own power or through the normal use of an appropriate tow tractor and tow bar is considered to be a disabled aircraft. Examples are:

One or more of the landing gears is off the hard surface of a runway, taxiway or apron,

aircraft bogged down in mud or snow,

one or more landing gear collapsed or damaged,

and the aircraft is considered to be **economically repairable**.

Aircraft Recovery Categories

In accordance with the International Civil Aviation Organization (ICAO) Annex 14, Chapter 9.3 and Airport Services Manual Part 5, Aircraft Recovery accidents are divided into two categories, Large Aircraft and Small Aircraft. We divide recovery operations into three categories. They are described as:

Light (Category I)

Medium (Category II)

Heavy (Category III)

Category I Aircraft Recovery

Described as **light** Aircraft Recovery case !

Is when an aircraft departs the runway with one or more of its landing gears, the landing gears are fully extended and locked, and the aircraft can be towed on its own.



Category II Aircraft Recovery

Described as **medium** Aircraft Recovery case !

Is when one or more landing gears are not or only partially extended. After lifting the aircraft, gears can be extended / locked or repaired and the aircraft can be towed on its own.



Category III Aircraft Recovery

Described as **heavy** Aircraft Recovery case !

Is when one or more landing gears are separated from the aircraft structure, or are so heavily damaged that the aircraft cannot be towed on its own landing gears.



Aircraft Recovery

Legal Aspects

Aircraft recovery operations are generally regulated at three levels:

International: International Civil Aviation Organization (ICAO)
 - International Standards and Recommended Practices, ICAO Annex 14, chapter 9.3
 - Airport Service Manual Part 5, Removal of Disabled Aircraft (Third Edition 1996)

National: National Laws & Aviation Regulations

Local: State Laws & Aviation Regulations
 Airport User Regulations/Agreements
 Airport Emergency Plans

International Standards ICAO Annex 14, Chapter 9.3

9.3.1 Recommendation. – *A plan for the removal of an aircraft disabled on, or adjacent to, the movement area should be established for an aerodrome, and a **coordinator designated** to implement the plan, when necessary.*

9.3.2 Recommendation. – *The disabled aircraft removal plan should be based on the characteristics of the aircraft that may normally be expected to operate at the aerodrome, and include among other things:*

- a) a list of equipment and personnel on, or in the vicinity of the aerodrome which would be available for such purpose, and
- b) arrangements for the rapid receipt of aircraft recovery kits available from other aerodromes

The provisions of Annex 14, Volume I, recommend that States establish a plan for the removal of disabled aircraft and recommends the designation of an Aircraft Recovery Coordinator. Implementation of these recommendations are specified in:



Airport Services Manual Part 5 „Removal of Disabled Aircraft“

Airport Services Manual, Part 5

The Airport Service Manual discusses the responsibility for removing a disabled aircraft, emphasizes the need for pre-arranged recovery agreements and illustrates some of the various methods employed during recovery operations. It is divided into 6 chapters:

- **Chapter 1: Introduction and Responsibilities**
- **Chapter 2: Disabled Aircraft Removal Plan**
- Chapter 3: Procedures and Techniques
- Chapter 4: Equipment
- Chapter 5: Recovery Methods
- Chapter 6: Aircraft Recovery Information

DAR Responsibilities

- Disabled aircraft removal is generally the responsibility of the **registered** owner or operator concerned.....
- The airport authority may or may not possess the knowledge or experience required to safely recover the aircraft.....
- In any event, if the registered owner or operator cannot recover the aircraft or can not proceed in timely manner, the airport management should have the authority to act on behalf of the aircraft owner or operator (*Refer to local Airport User Regulations and Agreements*)

Bottom Line --- The Responsibility falls on both the airport authority and the aircraft owner!

Disabled Aircraft Recovery Plan

As recommended by ICAO Annex 14, airports should develop a disabled aircraft recovery plan.....

Purpose:

To make suitable arrangements (in advance) to ensure the prompt arrival of the appropriate recovery equipment and any experts who may be required for the removal operation.

Goal:

Pre-coordinate all aircraft recovery activities with all involved agencies and to:

- ensure safety of all personnel working on the recovery operation,
- prevent secondary damage to the aircraft,
- keep runway closure time to a minimum.

Disabled Aircraft Recovery Plan

The plan should be based on the characteristics of the aircraft that may normally be expected to operate at the airport and should include:

- The appointment of a Local Aircraft Recovery Coordinator (LARC)
- The establishment of an DAR Team
- Define team member roles and responsibilities
- Listing of available DAR equipment
- Listing of personnel and specialist available to assist in the recovery
- Notification procedures for DAR team members and other agencies
- Listing of on-airport/off-airport resources available (contractors)
- Procedures to activate special equipment kits and teams
- Establishment of an incident command structure
- Identify airport access routes on all parts of the airport
- Include airport grid maps
- Identify means to obtain aircraft specific technical information
- Procedures to ensure incident site security



Disabled Aircraft Recovery Plan

- Identify predetermined procedures for site and personnel safety
- Determine personal protective equipment requirements
- Identify human factor needs
 - Shelter, Clothing, Rehabilitation, etc.
- Identify and determine aircraft de-fueling procedures
- Aircraft recovery release procedures
 - Coordination with aircraft operator
 - Coordination with airport authority
 - Coordination with accident investigation team
 - Coordination with local authorities

Pre-arranged
Removal
Contract!



Local Aircraft Recovery Coordinator

Primary Responsibilities:

- Aircraft Recovery Plan Development & Coordination
- Organizes and equips the disabled aircraft recovery team (DART)
- Coordinates DAR training for DART members
- Develops with assistance from technical experts the recovery plan
- Provides over-all incident site management and operational control over all agencies involved in the recovery effort
- Reviews and validates current operational procedures



Recovery Foreman/Supervisors

Primary Responsibilities:

- Assist with the development of recovery strategy & tactics
- Directs the on-site recovery operation
- Assigns work assignments to DART members
- Monitors recovery progress
- Implements tactical revisions to the recovery procedure when needed
- Monitors DART safety



Key Principles

- Whenever possible, moving of damaged aircraft should be accomplished with the aircraft supported on its own gears.
- Technical expertise from the aircraft manufacturer is a must!
 - Aircraft Recovery Manuals
- All required recovery equipment and personnel must be available prior to start of the recovery operation
- DAR team members must fully understand work assignments
- Recovery checklist must be followed!

Pre-Incident Planning is essential!

Disabled Aircraft Recovery Action Center ***D-A-R-A-C***



365 days, 24 hours

Level 1

Telephone Consultant

Level 2

On-Site Consultant

Level 3

Aircraft Recovery

Snapshot of our Experience



Location	Aircraft	Description	Task
Khartoum - Sudan	DC 8	Nose landing gear broke after landing	Recovery
Frankfurt - Germany	DC 8	Left main gear damaged following overrun	Recovery
Luxemburg	DC 8	All brakes blocked and tires deflated upon landing. Aircraft bogged down in muddy terrain	Recovery
Frankfurt - Germany	B 727	Right main gear broke after landing.	Recovery
Leipzig - Germany	MD 83	Got soaked in swampy grassland during taxiing	Recovery
Frankfurt - Germany	B 747 - Cargo	All brakes blocked & wheels damaged after overrun. Got stuck in muddy terrain	Recovery
Hamburg - Germany	B 767	Right main gear collapsed during taxiing	Recovery
Manila - Philippines	B 747	Nose gear was totally destroyed	Recovery
Frankfurt - Germany	MD 80	Nose gear bent while towing	Recovery
Egelsbach - Germany	MU 2	Landing gears totally wrecked	Recovery
Frankfurt - Germany	Beech 1900	Landed without gear	Recovery
Vienna - Austria	A 310 - 304	Left main gear totally destroyed	Consultation in Recovery & Transportation
Frankfurt - Germany	B 757	All tires punctured	Recovery
Frankfurt - Germany	A 321	Got stranded in muddy terrain during snow storm	Recovery
Frankfurt - Germany	A 300 - 600	Became disabled in muddy terrain during snow storm	Recovery
Speyer - Germany	B 747 - 400	none	Lifted aircraft onto podium for aviation

Eurowings ATR 72 Frankfurt Airport, 22.12.2004



Eurowings ATR 72 Frankfurt Airport, 22.12.2004



Boeing 747
Manila Philippines - 1996



Boeing 767
Hamburg Germany - 1995



Airbus 340-300
Frankfurt Germany – December 2003



DC-10
Frankfurt-Hahn Airport – January 2004



B 747-200
Düsseldorf Airport – January 2005



B 747-200
Düsseldorf Airport – January 2005

